

Model Name: GA-H87M-HD3

Revision 1.1

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 *2 SLOT
16	PCI SLOT
17	ITE 8728 LPC IO
18	COM,KB_MS_USB,USB30_20
19	HWM,FAN CTRL,OV,-PROCHOT
20	DUAL BIOS
21	FP,FUSB,SPK,SATALED
22	Realtek ALC887-VD2
23	REAR AUDIO JACK
24	REALTEK RTL8111F
25	DISCRETE POWER
26	ATX , CLOCK GEN
27	VCORE ISL95820_1

SHEET

TITLE

28	VCORE ISL95820_2
29	RT8120_DDR POWER
30	LPT, M3 POWER
31	DVI, HDMI
32	IT8892E

www.aitech1.ru

Gigabyte Technology

Cover Sheet

Size	Document Number	Rev
Custom	GA-H87M-HD3	1.1
Date:	Tuesday, July 30, 2013	Sheet 1 of 32

## Revision 1.1

## Component value change history

[illegible][illegible]

BLOCK DIAGRAM

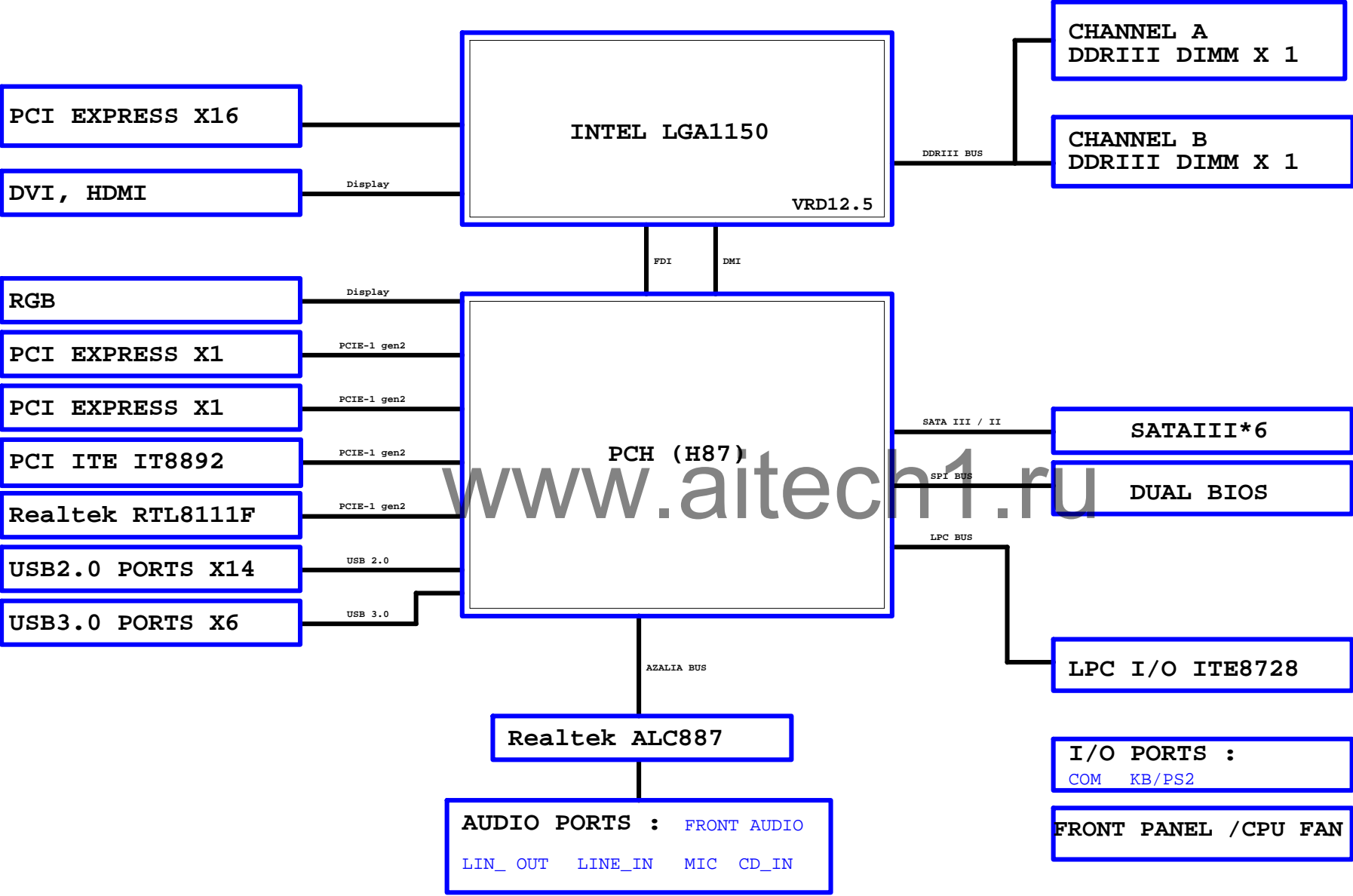


Figure 10-10: HW Configurations for the 100 Series (continued)

Diagram illustrating the pinout for LGA1150D, showing connections for FDI signals. The diagram includes a central pinout table with columns for pin names, pin numbers, and signal names. Connections are shown as lines between the pinout table and external signal names. Some connections are marked with 'X' indicating a mismatch or error.

Signal	Pin	Pin Name	Signal
[9] FDI_CSYN	D16	FDI_CSYN	DDI1_TXP0
[9] FDI_INT	D18	FDI_INT	DDI1_TXN0
[9] FDI_RCOMP	R4	DP_RCOMP	DDI1_TXP1
[10] N_DP_CLK	U5	SSC_DPCLKN	DDI1_TXN1
[10] N_DP_CLK	U6	SSC_DPCLKP	DDI1_TXP2
	X E16	EDP_DISP_UTIL	DDI1_TXN2
	X K11	RSVD_TP	DDI1_TXP3
	X J12	RSVD_TP	DDI1_TXN3
FDI_TXN0	B14	FDI_EDP_TXN0	DDI2_TXP0
FDI_TXP0	A14	FDI_EDP_TXP0	DDI2_TXN0
FDI_TXN1	C13	FDI_EDP_TXN1	DDI2_TXP1
FDI_TXP1	B13	FDI_EDP_TXP1	DDI2_TXN1
			DDI2_TXP2
			DDI2_TXN2
			DDI2_TXP3
			DDI2_TXN3
			DDI3_TXP0
			DDI3_TXN0
			DDI3_TXP1
			DDI3_TXN1
			DDI3_TXP2
			DDI3_TXN2
			DDI3_TXP3
			DDI3_TXN3

Connections to external signals:

- DDI1\_TXP0 → DVI\_TX2 [31]
- DDI1\_TXN0 → DVI\_TX2- [31]
- DDI1\_TXP1 → DVI\_TX1 [31]
- DDI1\_TXN1 → DVI\_TX1- [31]
- DDI1\_TXP2 → DVI\_TX0 [31]
- DDI1\_TXN2 → DVI\_TX0- [31]
- DDI1\_TXP3 → DVI\_TXC [31]
- DDI1\_TXN3 → DVI\_TXC- [31]
- DDI2\_TXP0 → HDMI\_TX2 [31]
- DDI2\_TXN0 → HDMI\_TX2- [31]
- DDI2\_TXP1 → HDMI\_TX1 [31]
- DDI2\_TXN1 → HDMI\_TX1- [31]
- DDI2\_TXP2 → HDMI\_TX0 [31]
- DDI2\_TXN2 → HDMI\_TX0- [31]
- DDI2\_TXP3 → HDMI\_TXC [31]
- DDI2\_TXN3 → HDMI\_TXC- [31]
- DDI3\_TXP0 → HDMI\_TXC- [31]
- DDI3\_TXN0 → HDMI\_TXC- [31]
- DDI3\_TXP1 → HDMI\_TXC- [31]
- DDI3\_TXN1 → HDMI\_TXC- [31]
- DDI3\_TXP2 → HDMI\_TXC- [31]
- DDI3\_TXN2 → HDMI\_TXC- [31]
- DDI3\_TXP3 → HDMI\_TXC- [31]
- DDI3\_TXN3 → HDMI\_TXC- [31]

Impedance: 85 +/- 17.5%

PCIEX16:16/5/5/5/16(breakout min 10/4/4/4/10)									
Impedance=80 +- 1.5%									
LGA1150C									
PA EXP RXP0	E15	PEG_RXP0	PEG_TXP0	A12	PA EXP TXP0				
PA EXP RXN0	F15	PEG_RXN0	PEG_TXN0	B12	PA EXP TXN0				
PA EXP RXP1	D14	PEG_RXP1	PEG_TXP1	B11	PA EXP TXP1				
PA EXP RXN1	E14	PEG_RXN1	PEG_TXN1	C11	PA EXP TXN1				
PA EXP RXP2	E13	PEG_RXP2	PEG_TXP2	C10	PA EXP TXP2				
PA EXP RXN2	F13	PEG_RXN2	PEG_TXN2	D10	PA EXP TXN2				
PA EXP RXP3	D12	PEG_RXP3	PEG_TXP3	B9	PA EXP TXP3				
PA EXP RXN3	E12	PEG_RXN3	PEG_TXN3	C9	PA EXP TXN3				
PA EXP RXP4	E11	PEG_RXP4	PEG_TXP4	C8	PA EXP TXP4				
PA EXP RXN4	F11	PEG_RXN4	PEG_TXN4	D8	PA EXP TXN4				
PA EXP RXP5	F10	PEG_RXP5	PEG_TXP5	B7	PA EXP TXP5				
PA EXP RXN5	G10	PEG_RXN5	PEG_TXN5	C7	PA EXP TXN5				
PA EXP RXP6	E9	PEG_RXP6	PEG_TXP6	A6	PA EXP TXP6				
PA EXP RXN6	F9	PEG_RXN6	PEG_TXN6	B6	PA EXP TXN6				
PA EXP RXP7	F8	PEG_RXP7	PEG_TXP7	B5	PA EXP TXP7				
PA EXP RXN7	G8	PEG_RXN7	PEG_TXN7	C5	PA EXP TXN7				
PA EXP RXP8	D3	PEG_RXP8	PEG_TXP8	E1	PA EXP TXP8				
PA EXP RXN8	D4	PEG_RXN8	PEG_TXN8	F2	PA EXP TXN8				
PA EXP RXP9	E4	PEG_RXP9	PEG_TXP9	F2	PA EXP TXP9				
PA EXP RXN9	E5	PEG_RXN9	PEG_TXN9	G3	PA EXP TXN9				
PA EXP RXP10	F5	PEG_RXP10	PEG_TXP10	G1	PA EXP TXP10				
PA EXP RXN10	F6	PEG_RXN10	PEG_TXN10	G2	PA EXP TXN10				
PA EXP RXP11	G4	PEG_RXP11	PEG_TXP11	H2	PA EXP TXP11				
PA EXP RXN11	G5	PEG_RXN11	PEG_TXN11	J1	PA EXP TXP12				
PA EXP RXP12	H5	PEG_RXP12	PEG_TXP12	J2	PA EXP TXN12				
PA EXP RXN12	H6	PEG_RXN12	PEG_TXN12	K2	PA EXP TXP13				
PA EXP RXP13	J4	PEG_RXP13	PEG_TXP13	K3	PA EXP TXN13				
PA EXP RXN13	J5	PEG_RXN13	PEG_TXN13	M2	PA EXP TXP14				
PA EXP RXP14	K5	PEG_RXP14	PEG_TXP14	M3	PA EXP TXN14				
PA EXP RXN14	K6	PEG_RXN14	PEG_TXN14	L2	PA EXP TXP15				
PA EXP RXP15	L4	PEG_RXP15	PEG_TXP15	L1	PA EXP TXN15				
PA EXP RXN15	L5	PEG_RXN15	PEG_TXN15						
A DMI ORXP	U3	DMI_RXP0	DMI_TXP0	A44	A DMI OTXP				
A DMI ORXN	T3	DMI_RXN0	DMI_TXN0	A45	A DMI OTXN				
A DMI 1RXP	U1	DMI_RXP1	DMI_TXP1	AB3	A DMI 1TXP				
A DMI 1RXN	U2	DMI_RXN1	DMI_TXN1	AB4	A DMI 1TXN				
A DMI 2RXP	V2	DMI_RXP2	DMI_TXP2	AC5	A DMI 2TXP				
A DMI 2RXN	V3	DMI_RXN2	DMI_TXN2	AC4	A DMI 2TXN				
A DMI 3RXP	W3	DMI_RXP3	DMI_TXP3	AC1	A DMI 3TXP				
A DMI 3RXN	W4	DMI_RXN3	DMI_TXN3	AC2	A DMI 3TXN				
<div> <div> <div>W=12 mil out of CPU</div> <div>S=15 mil out of CPU</div> </div> <div> <div>RSVD_TP</div> <div>RSVD_TP</div> <div>RSVD_TP</div> <div>RSVD_TP</div> </div> </div>									

Figure 10 is a schematic diagram of the current source circuit for the 1.1V divider. It features two NPN transistors, SOT23 WQ1 and SOT23 WQ2, configured as a current mirror. The base of WQ1 is connected to VCC3 via a 200k resistor (WR26). The base of WQ2 is connected to the emitter of WQ1. The emitter of WQ1 is connected to ground through a 100k resistor (WR31). The emitter of WQ2 is connected to ground through an 8.2k resistor (WR45). The collector of WQ2 is connected to the 3VDUAL supply. The collector of WQ1 is connected to the A\_CPUREST pin. A red line and text "1.1V分壓" indicate the 1.1V divider connection.

CPU LGA1150-A			
Document Number	GA-H87M-HD3		Rev 1.1
Tuesday, July 30, 2013		Sheet 4 of 32	

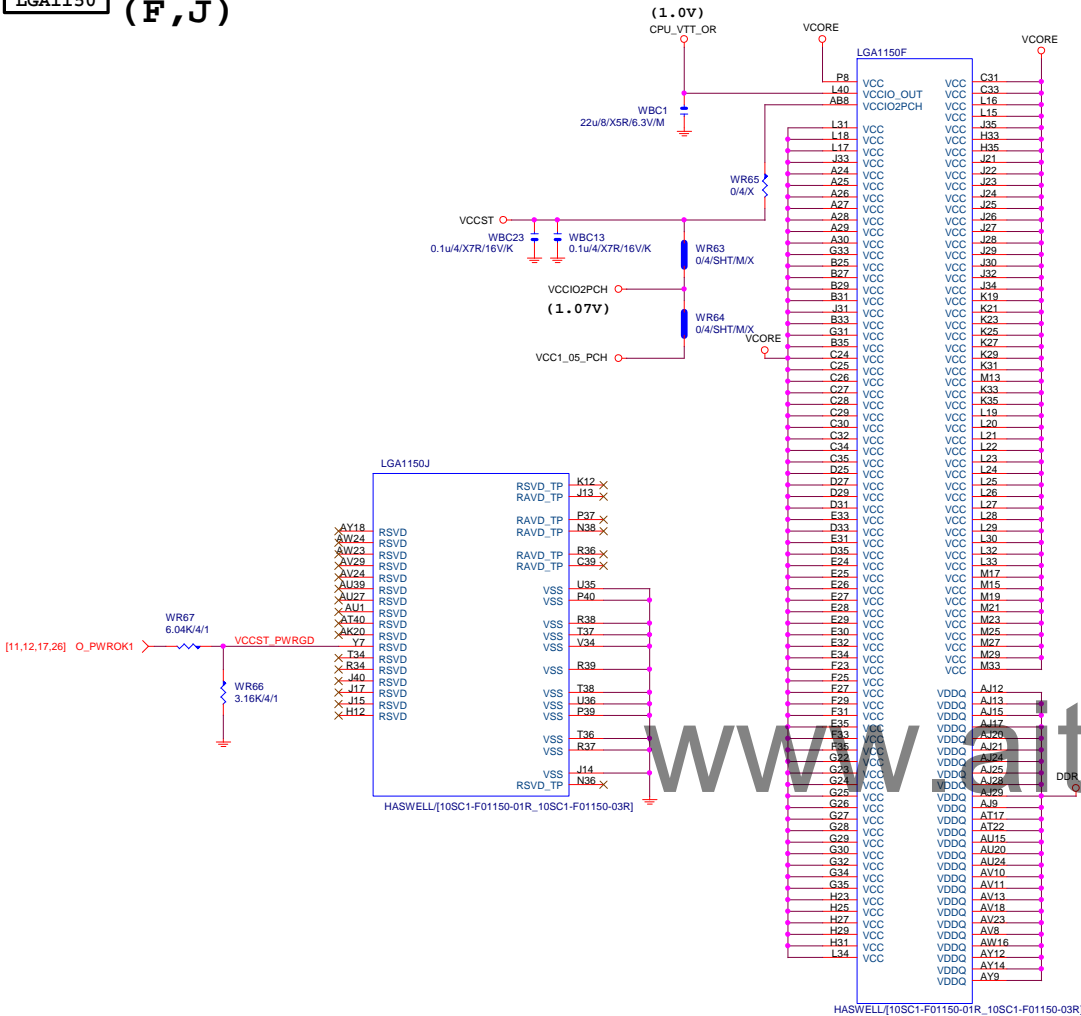
# LGA1150 (A)

# LGA1150 (B)

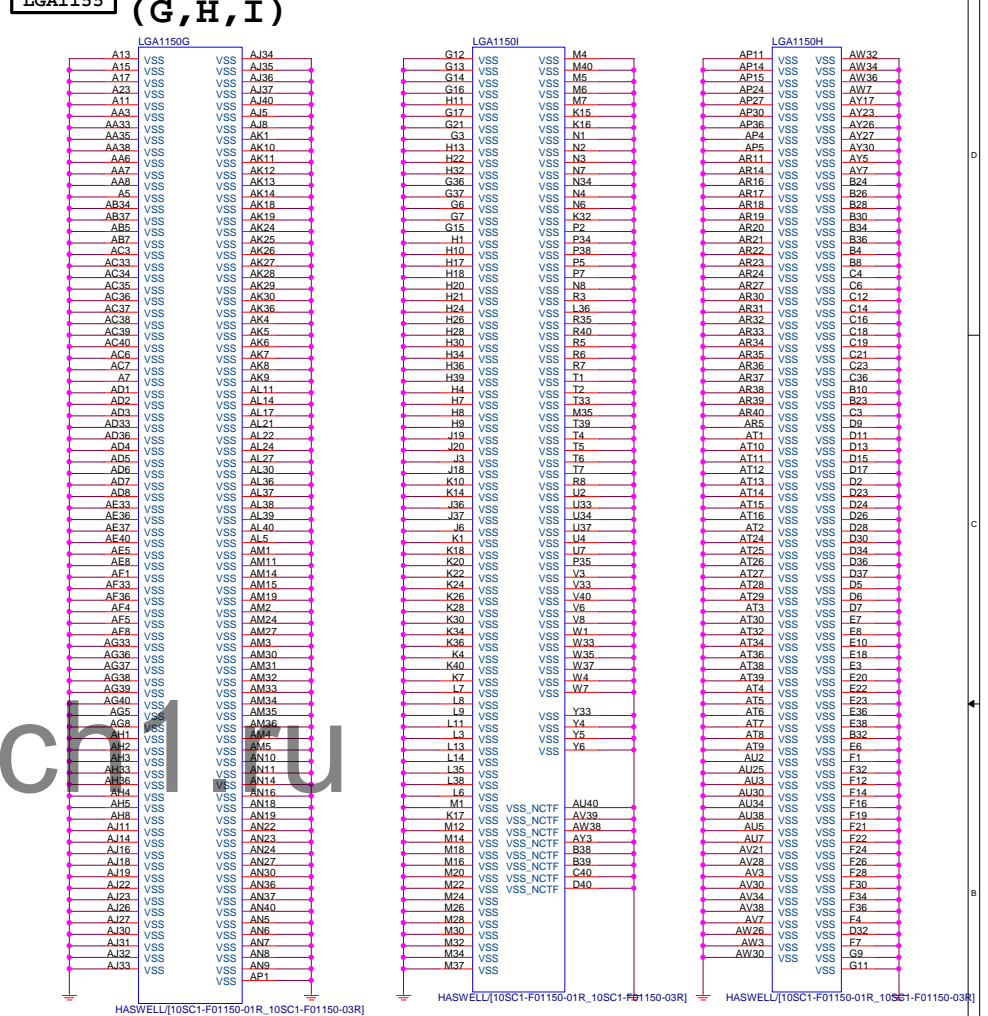
# LGA1150 (CR)

LGA1150A			
MAAA0	AU13	DDR0_MA0	DDR0_D00
MAAA1	AV16	DDR0_MA1	DDR0_D01
MAAA2	AU16	DDR0_MA2	DDR0_D02
MAAA3	AW17	DDR0_MA3	DDR0_D03
MAAA4	AU17	DDR0_MA4	DDR0_D04
MAAA5	AW18	DDR0_MA5	DDR0_D05
MAAA6	AV17	DDR0_MA6	DDR0_D06
MAAA7	AT18	DDR0_MA7	DDR0_D07
MAAA8	AU18	DDR0_MA8	DDR0_D08
MAAA9	AT19	DDR0_MA9	DDR0_D09
MAAA10	AW11	DDR0_MA10	DDR0_D10
MAAA11	AV19	DDR0_MA11	DDR0_D11
MAAA12	AU19	DDR0_MA12	DDR0_D12
MAAA13	AT20	DDR0_MA13	DDR0_D13
MAAA14	AT20	DDR0_MA14	DDR0_D14
MAAA15	AU21	DDR0_MA15	DDR0_D15
MODT_A0	AW10	DDR0_ODT0	DDR0_D16
MODT_A1	AV8	DDR0_ODT1	DDR0_D17
	AW8	DDR0_ODT2	DDR0_D18
	AW8	DDR0_ODT3	DDR0_D19
			DDR0_D20
			DDR0_D21
			DDR0_D22
			DDR0_D23
			DDR0_D24
			DDR0_D25
			DDR0_D26
			DDR0_D27
			DDR0_D28
			DDR0_D29
			DDR0_D30
			DDR0_D31
			DDR0_D32
			DDR0_D33
			DDR0_D34
			DDR0_D35
			DDR0_D36
			DDR0_D37
			DDR0_D38
			DDR0_D39
			DDR0_D40
			DDR0_D41
			DDR0_D42
			DDR0_D43
			DDR0_D44
			DDR0_D45
			DDR0_D46
			DDR0_D47
			DDR0_D48
			DDR0_D49
			DDR0_D50
			DDR0_D51
			DDR0_D52
			DDR0_D53
			DDR0_D54
			DDR0_D55
			DDR0_D56
			DDR0_D57
			DDR0_D58
			DDR0_D59
			DDR0_D60
			DDR0_D61
			DDR0_D62
			DDR0_D63
			DDR0_D64
			DDR0_D65
			DDR0_D66
			DDR0_D67
			DDR0_D68
			DDR0_D69
			DDR0_D70
			DDR0_D71
			DDR0_D72
			DDR0_D73
			DDR0_D74
			DDR0_D75
			DDR0_D76
			DDR0_D77
			DDR0_D78
			DDR0_D79
			DDR0_D80
			DDR0_D81
			DDR0_D82
			DDR0_D83
			DDR0_D84
			DDR0_D85
			DDR0_D86
			DDR0_D87
			DDR0_D88
			DDR0_D89
			DDR0_D90
			DDR0_D91
			DDR0_D92
			DDR0_D93
			DDR0_D94
			DDR0_D95
			DDR0_D96
			DDR0_D97
			DDR0_D98
			DDR0_D99
			DDR0_D100
			DDR0_D101
			DDR0_D102
			DDR0_D103
			DDR0_D104
			DDR0_D105
			DDR0_D106
			DDR0_D107
			DDR0_D108
			DDR0_D109
			DDR0_D110
			DDR0_D111
			DDR0_D112
			DDR0_D113
			DDR0_D114
			DDR0_D115
			DDR0_D116
			DDR0_D117
			DDR0_D118
			DDR0_D119
			DDR0_D120
			DDR0_D121
			DDR0_D122
			DDR0_D123
			DDR0_D124
			DDR0_D125
			DDR0_D126
			DDR0_D127
			DDR0_D128
			DDR0_D129
			DDR0_D130
			DDR0_D131
			DDR0_D132
			DDR0_D133
			DDR0_D134
			DDR0_D135
			DDR0_D136
			DDR0_D137
			DDR0_D138
			DDR0_D139
			DDR0_D140
			DDR0_D141
			DDR0_D142
			DDR0_D143
			DDR0_D144
			DDR0_D145
			DDR0_D146
			DDR0_D147
			DDR0_D148
			DDR0_D149
			DDR0_D150
			DDR0_D151
			DDR0_D152
			DDR0_D153
			DDR0_D154
			DDR0_D155
			DDR0_D156
			DDR0_D157
			DDR0_D158
			DDR0_D159
			DDR0_D160
			DDR0_D161
			DDR0_D162
			DDR0_D163
			DDR0_D164
			DDR0_D165
			DDR0_D166
			DDR0_D167
			DDR0_D168
			DDR0_D169
			DDR0_D170
			DDR0_D171
			DDR0_D172
			DDR0_D173
			DDR0_D174
			DDR0_D175
			DDR0_D176
			DDR0_D177
			DDR0_D178
			DDR0_D179
			DDR0_D180
			DDR0_D181
			DDR0_D182
			DDR0_D183
			DDR0_D184
			DDR0_D185
			DDR0_D186
			DDR0_D187
			DDR0_D188
			DDR0_D189
			DDR0_D190
			DDR0_D191
			DDR0_D192
			DDR0_D193
			DDR0_D194
			DDR0_D195
			DDR0_D196
			DDR0_D197
			DDR0_D198
			DDR0_D199
			DDR0_D200
			DDR0_D201
			DDR0_D202
			DDR0_D203
			DDR0_D204
			DDR0_D205
			DDR0_D206
			DDR0_D207
			DDR0_D208
			DDR0_D209
			DDR0_D210
			DDR0_D211
			DDR0_D212
			DDR0_D213
			DDR0_D214
			DDR0_D215
			DDR0_D216
			DDR0_D217
			DDR0_D218
			DDR0_D219
			DDR0_D220
			DDR0_D221
			DDR0_D222
			DDR0_D223
			DDR0_D224
			DDR0_D225
			DDR0_D226
			DDR0_D227
			DDR0_D228
			DDR0_D229
			DDR0_D230
			DDR0_D231
			DDR0_D232
			DDR0_D233
			DDR0_D234
			DDR0_D235
			DDR0_D236
			DDR0_D237
			DDR0_D238
			DDR0_D239
			DDR0_D240
			DDR0_D241
			DDR0_D242
			DDR0_D243
			DDR0_D244
			DDR0_D245
			DDR0_D246
			DDR0_D247
			DDR0_D248
			DDR0_D249
			DDR0_D250
			DDR0_D251
			DDR0_D252
			DDR0_D253
			DDR0_D254
			DDR0_D255
			DDR0_D256
			DDR0_D257
			DDR0_D258
			DDR0_D259
			DDR0_D260
			DDR0_D261
			DDR0_D262
			DDR0_D263
			DDR0_D264
			DDR0_D265
			DDR0_D266
			DDR0_D267
			DDR0_D268
			DDR0_D269
			DDR0_D270
			DDR0_D271
			DDR0_D272
			DDR0_D273
			DDR0_D274
			DDR0_D275
			DDR0_D276
			DDR0_D277
			DDR0_D278
			DDR0_D279
			DDR0_D280
			DDR0_D281
			DDR0_D282
			DDR0_D283
			DDR0_D284
			DDR0_D285
			DDR0_D286
			DDR0_D287
			DDR0_D288
			DDR0_D289
			DDR0_D290
			DDR0_D291
			DDR0_D292
			DDR0_D293
			DDR0_D294
			DDR0_D295
			DDR0_D296
			DDR0_D297
			DDR0_D298
			DDR0_D299
			DDR0_D300
			DDR0_D301
			DDR0_D302
			DDR0_D303
			DDR0_D304
			DDR0_D305
			DDR0_D306
			DDR0_D307
			DDR0_D308
			DDR0_D309
			DDR0_D310
			DDR0_D311
			DDR0_D312
			DDR0_D313
			DDR0_D314
			DDR0_D315
			DDR0_D316
			DDR0_D317
			DDR0_D318
			DDR0_D319
			DDR0_D320
			DDR0_D321
			DDR0_D322
			DDR0_D323
			DDR0_D324
			DDR0_D325
			DDR0_D326
			DDR0_D327
			DDR0_D328
			DDR0_D329
			DDR0_D330
			DDR0_D331
			DDR0_D332
			DDR0_D333
			DDR0_D334
			DDR0_D335
			DDR0_D336
			DDR0_D337
			DDR0_D338
			DDR0_D339
			DDR0_D340
			DDR0_D341
			DDR0_D342
			DDR0_D343
			DDR0_D344
			DDR0_D345
			DDR0_D346
			DDR0_D347
			DDR0_D348
			DDR0_D349
			DDR0_D350
			DDR0_D351
			DDR0_D352
			DDR0_D353
			DDR0_D354
			DDR0_D355
			DDR0_D356
			DDR0_D357
			DDR0_D358
			DDR0_D359
			DDR0_D360
			DDR0_D361
			DDR0_D362
			DDR0_D363
			DDR0_D364
			DDR0_D365
			DDR0_D366
			DDR0_D367
			DDR0_D368
			DDR0_D369
			DDR0_D370
			DDR0_D371
			DDR0_D372
			DDR0_D373
			DDR0_D374
			DDR0_D375
			DDR0_D376
			DDR0_D377
			DDR0_D378
			DDR0_D379
			DDR0_D380
			DDR0_D381
			DDR0_D382
			DDR0_D383
			DDR0_D384
			DDR0_D385
			DDR0_D386
			DDR0_D387
			DDR0_D388
			DDR0_D389
			DDR0_D390
			DDR0_D391
			DDR0_D392
			DDR0_D393
			DDR0_D394
			DDR0_D395
			DDR0_D396
			DDR0_D397
			DDR0_D398
			DDR0_D399
			DDR0_D400
			DDR0_D401
			DDR0_D402
			DDR0_D403
			DDR0_D404
			DDR0_D405
			DDR0_D406
			DDR0_D407
			DDR0_D408
			DDR0_D409
			DDR0_D410
			DDR0_D411
			DDR0_D412
			DDR0_D413
			DDR0_D414
			DDR0_D415
			DDR0_D416
			DDR0_D417
			DDR0_D418
			DDR0_D419
			DDR0_D420
			DDR0_D421
			DDR0_D422
			DDR0_D423
			DDR0_D424
			DDR0_D425
			DDR0_D426
			DDR0_D427

# LGA1150 (F,J)

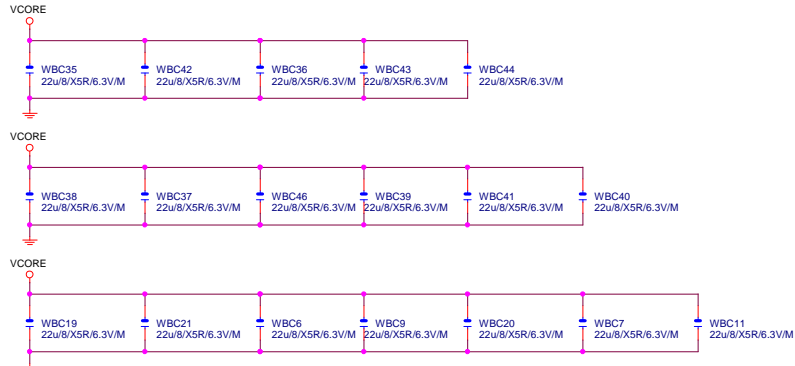


# LGA1155 (G,H,I)



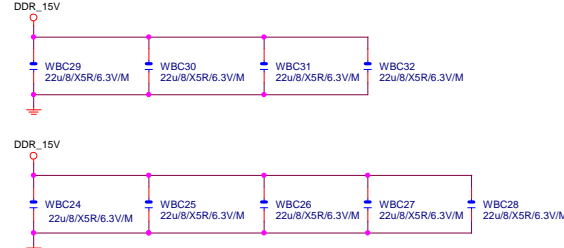
## VCore CAP

(X18)



## DDR CAP

(X9)



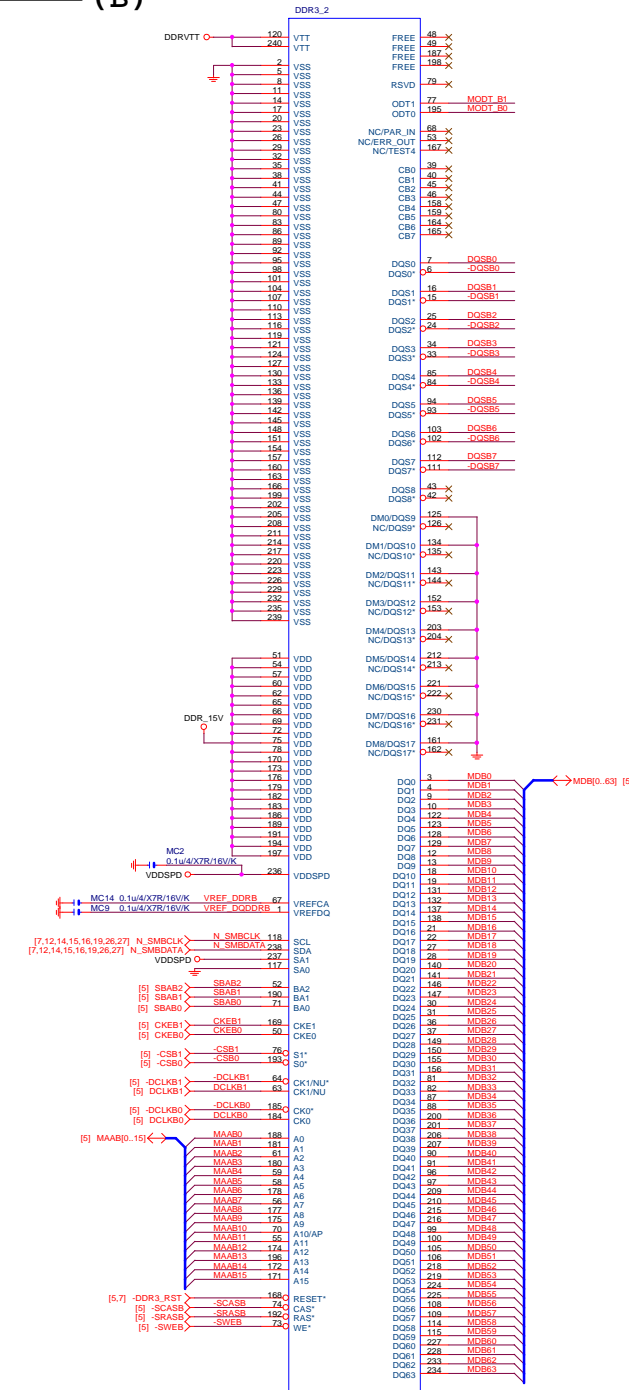
Gigabyte Technology

Title	CPU LGA1150-C		
Size	Custom	Document Number	GA-H87M-HD3
Date:	Tuesday, July 30, 2013	Sheet	6 of 32
Rev	1.1		

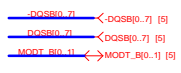


DDR3

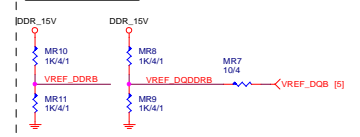
(B)



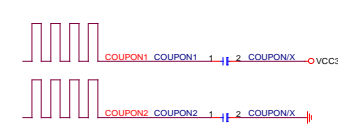
DDR3\_240/BK/VA/D  
BLACK CONNECTOR



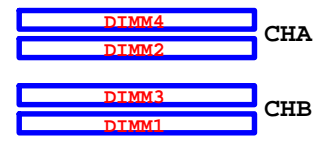
DDR3 VREF



COUPON



CPU



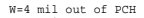
www.aitech1.ru



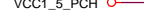
DMI:12/4/4/4/12(breakout min 8/4/4/4/8)  
Impedance=85 +- 17.5%

PCHB

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



W=4 mil out of PCH



8111G

.....

PCIEx1

Impedance=80 +- 17.5%

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

PCHJ



VCC3  
0

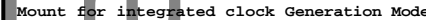
FDI\_TXP[0..1] >> FDI\_TXP[0..1] [4]

```
FDI_TXN[0..1]  >> FDI_TXN[0..1]  1 1
```

Impedance=85 +- 17.5%

Back Panel &lt; 10000 MILS

Front Panel < 6000 MILS



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

SB HEATSIN



GRAY HS

PCH\_HS  
PCH\_HS/12SP2-030005-43R\_12SP2-030005-41R\_12SP2-030005-42R

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

OC0#	F USB30
------	---------

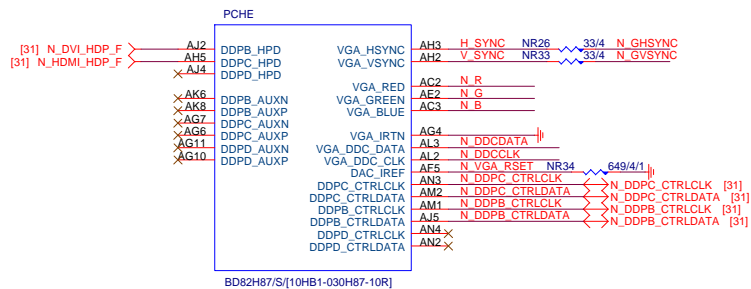
Title	PCH FDI,DMI,USB ,PCIE,NVRAM
-------	-----------------------------

Size	Document Number	<b>GA-H87M-HD3</b>
Custom		

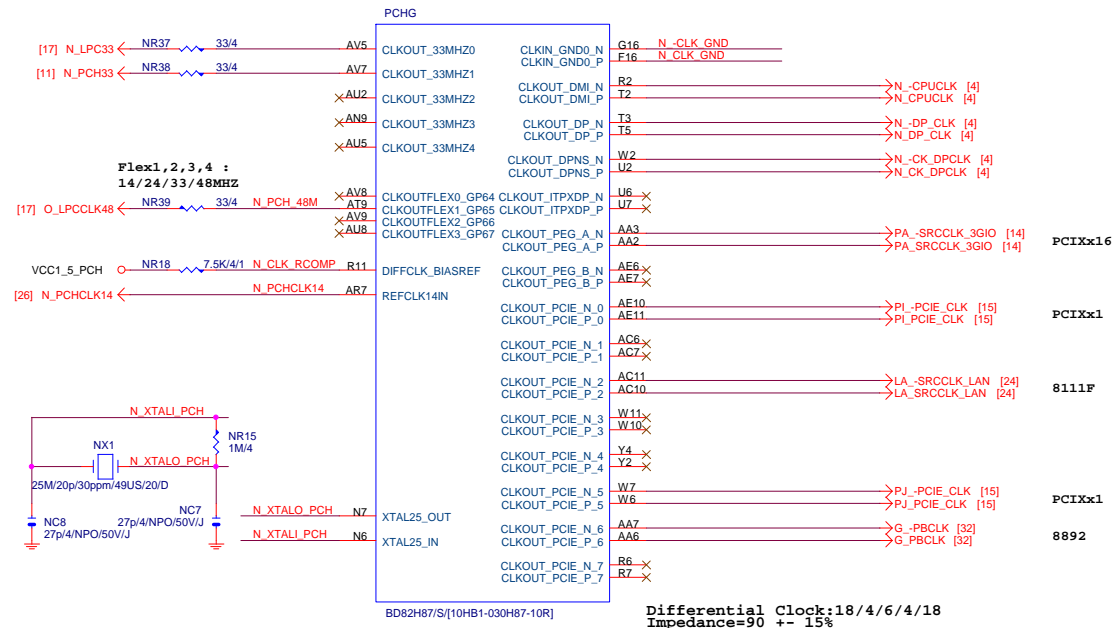
Date: Tuesday, July 30, 2013 Sheet 9 of 32

1.1

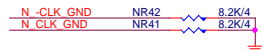
**PCH (E)**



**PCH (G)**



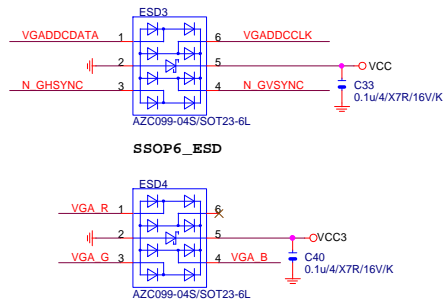
PCH CLK PD
------------



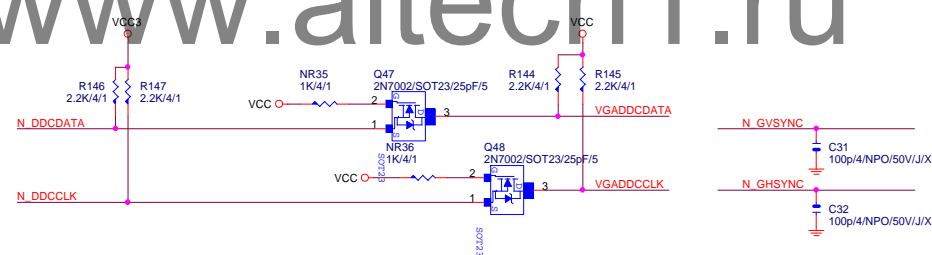
Mount for integrated clock Generation  
Mode



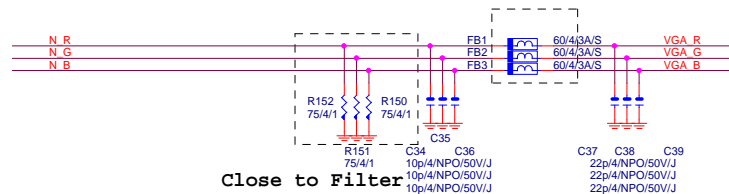
## VGA ESD



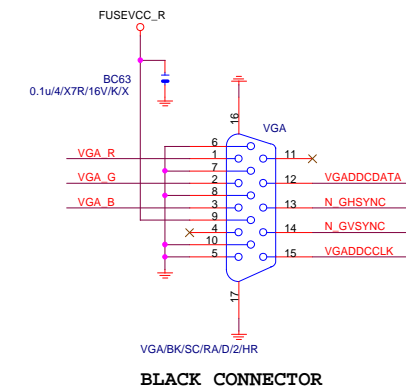
## VGA DDC



## VGA DDC



## VGA CONNECTOR



BLACK CONNECTOR

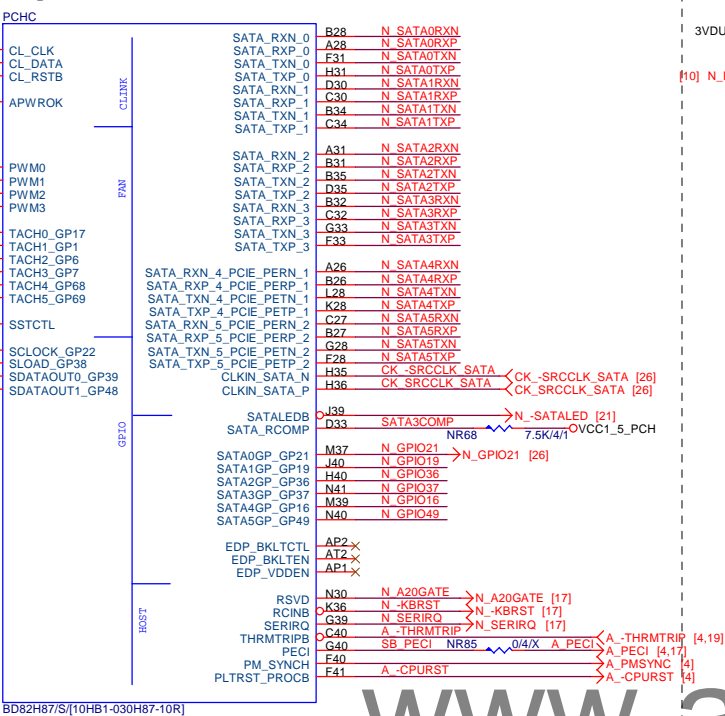
## Gigabyte Technology

### PCH DISPLAY ,CLK BUFFER

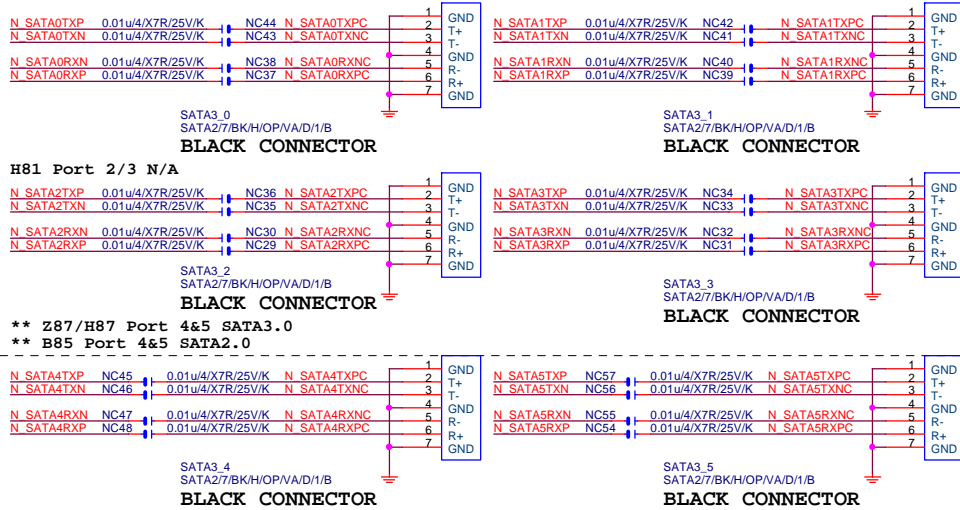
Size Custom	Document Number <b>GA-H87M-HD3</b>	Rev 1.1
Date: Tuesday, July 30, 2013	Sheet 10 of 32	

(C)

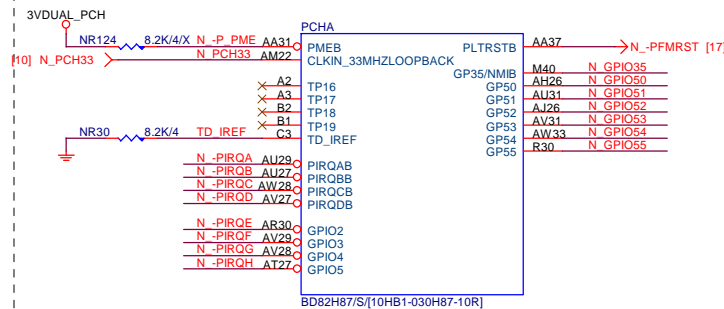
SATA3 : 20/7.5/4.5/7.5/20 (breakout min 8/4/4/4/8)  
Impedance=90 +- 17.5%  
SATA2 : 15/7.5/4.5/7.5/15 (breakout min 8/4/4/4/8)  
Impedance=90 +- 17.5%



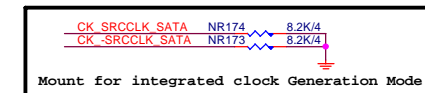
## SATA CONNECTOR



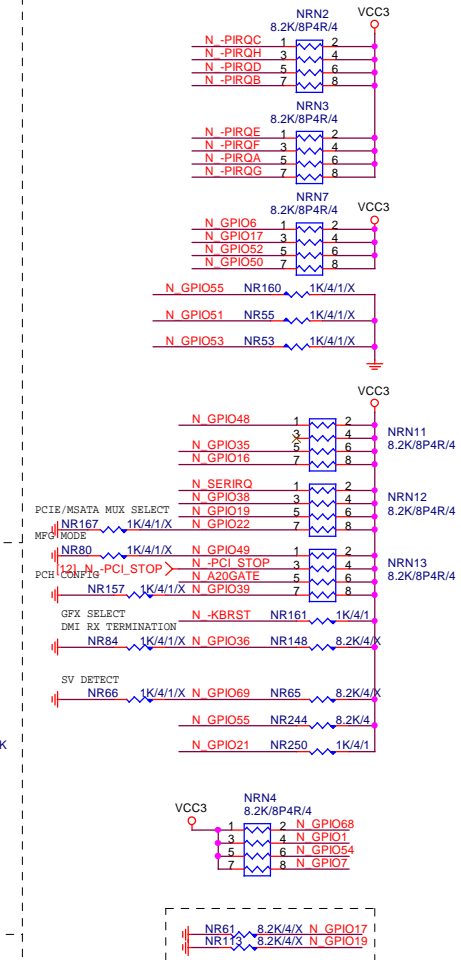
**PCH (A)**



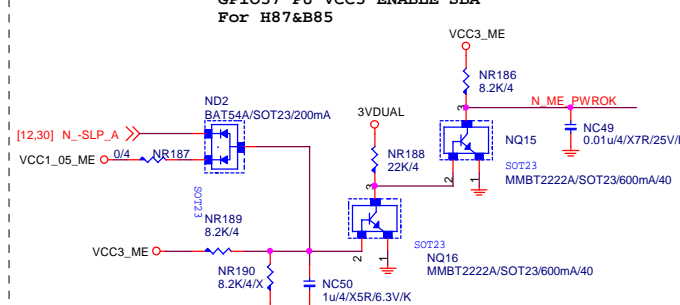
PCH	CLK	PD
-----	-----	----



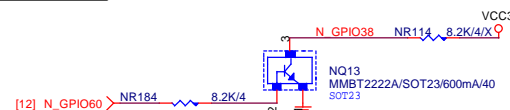
PCH	PU/PD
-----	-------



## ME PWROK



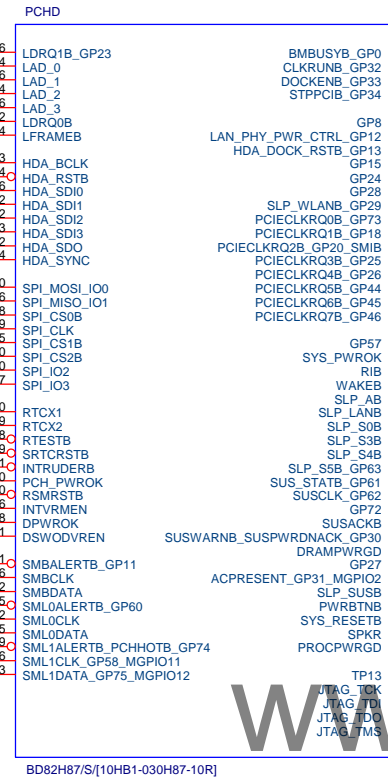
GPIO38 Ctrl



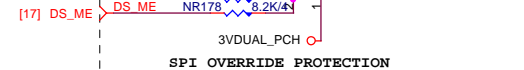
## Gigabyte Technology

Title			
PCH HOST , SATA, PCI			
Size	Document Number	Rev	
Custom	GA-H87M-HD3	1.1	
Date:	Tuesday, July 30, 2013	Sheet	11 of 32

(D)

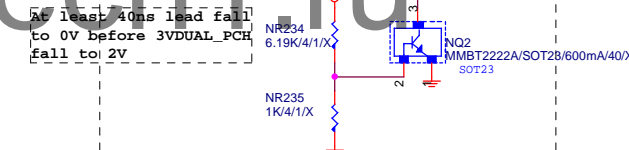


## ACZ\_SDOUT

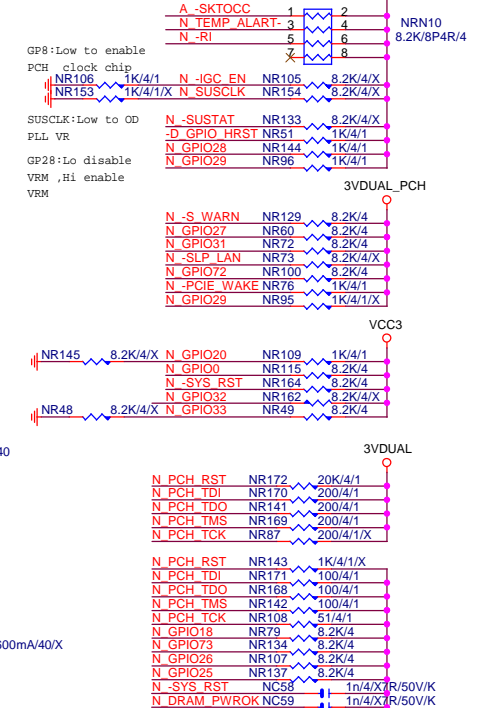


## PCH\_DPWROK

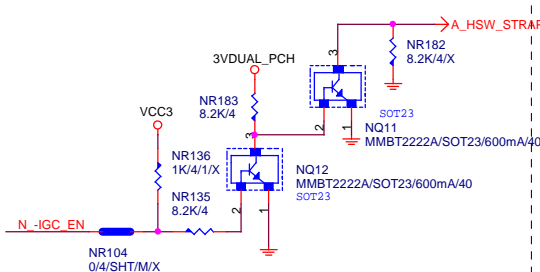
```
| At least 10ms delay after
| 3VDUAL_PCH stabel
```



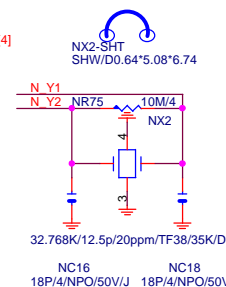
PCH	PU/PD
-----	-------



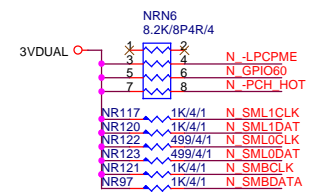
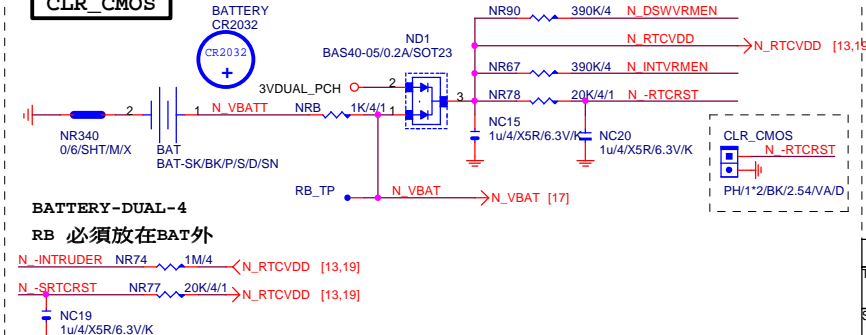
## HSW\_STRAP13



32.768KHZ



CLR\_CMOS

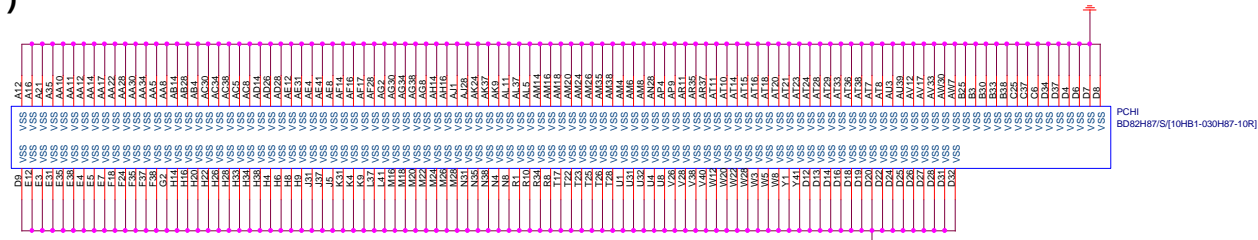


## Gigabyte Technology

## PCH GPIO , CTRL , AUDIO

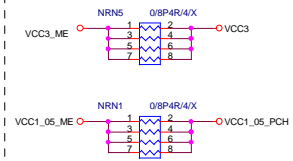
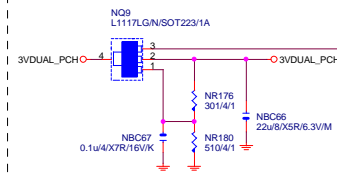
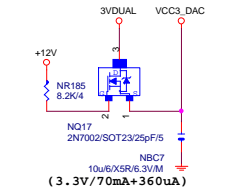
Title			
PCH GPIO , CTRL , AUDIO			
Size	Document Number	Rev	
Custom	GA-H87M-HD3	1.1	
Date:	Tuesday, July 30, 2013	Sheet	12 of 32

**PCH (I)**

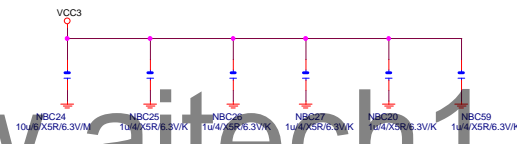


## 3VDUAL\_PCH

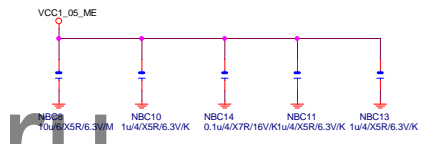
H87 N/A



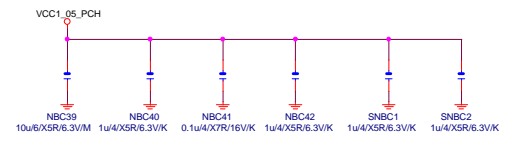
( 3.3V ) ( X6 )



(1.05V) (x5)



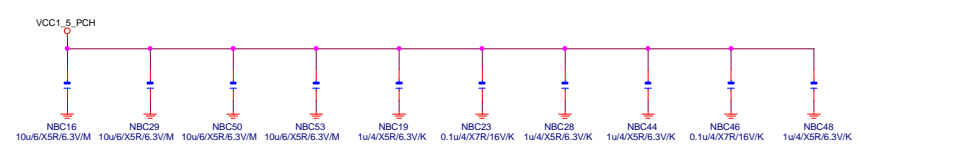
(1.05V)(x6)



(1.05V)(x2) (3.3V)(x2)

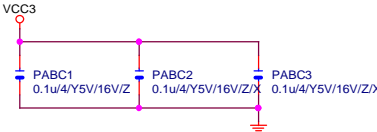


**(1.05V) (x10)**

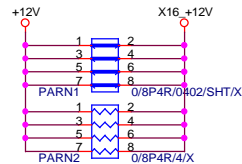




# PCIEX16 CAP



# PCIEX16 PROTECT SHT

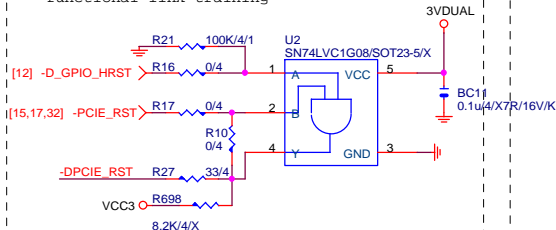


# PCIEX16 AC CAP

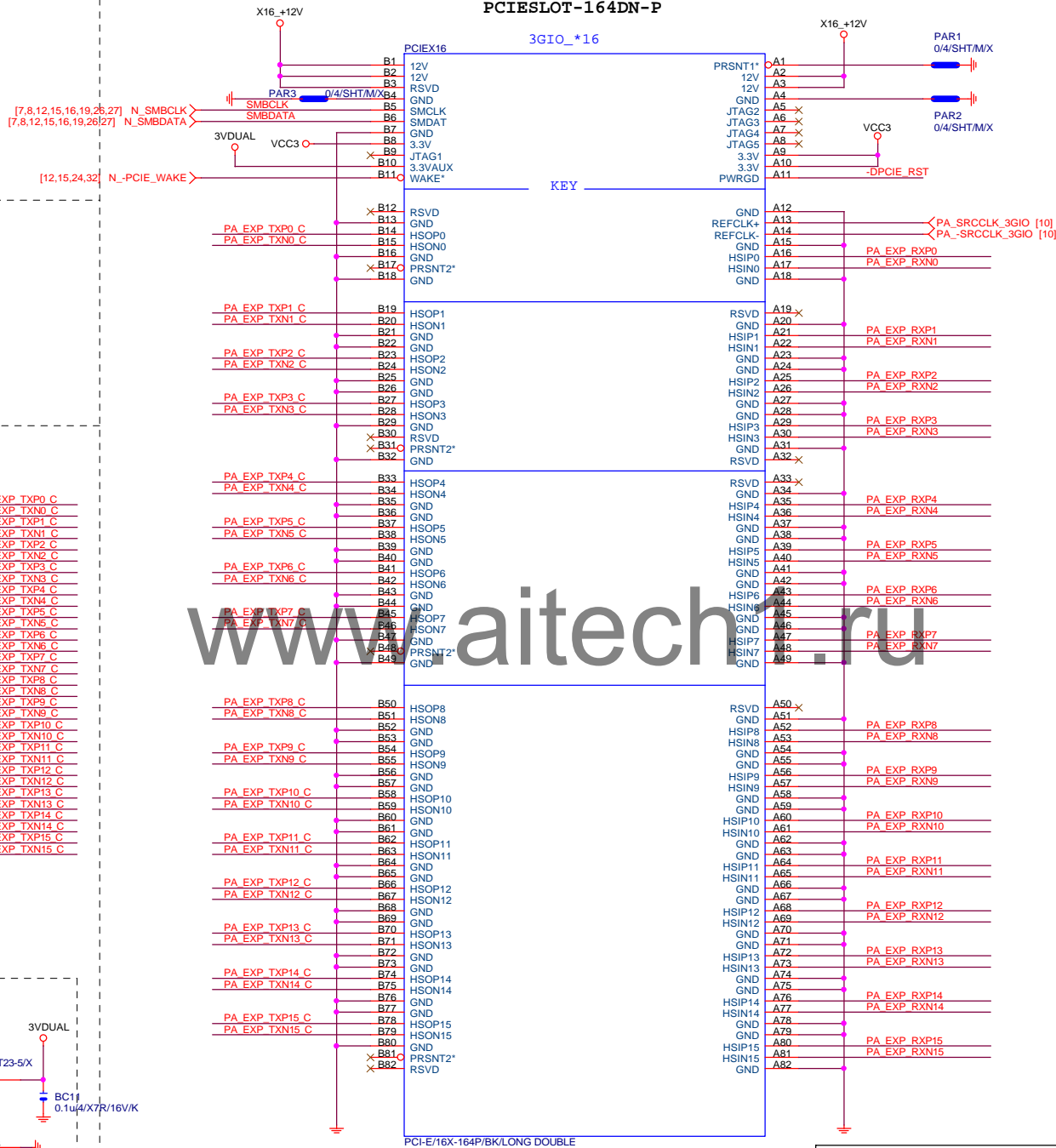
PA EXP TXP0	PAC5	0.22u4/X5R/6.3V/K	PA EXP TXP0 C
PA EXP TXN0	PAC4	0.22u4/X5R/6.3V/K	PA EXP TXN0 C
PA EXP TXP1	PAC6	0.22u4/X5R/6.3V/K	PA EXP TXP1 C
PA EXP TXN1	PAC7	0.22u4/X5R/6.3V/K	PA EXP TXN1 C
PA EXP TXP2	PAC8	0.22u4/X5R/6.3V/K	PA EXP TXP2 C
PA EXP TXN2	PAC9	0.22u4/X5R/6.3V/K	PA EXP TXN2 C
PA EXP 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	PAC18	0.22u4/X5R/6.3V/K	PA EXP TXP7 C
PA EXP TXN7	PAC19	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]

The auxiliary reset circuit is only required for PCIe Gen3 margining and functional link training



# PCIEX16 SLOT

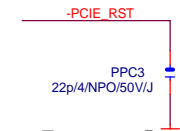
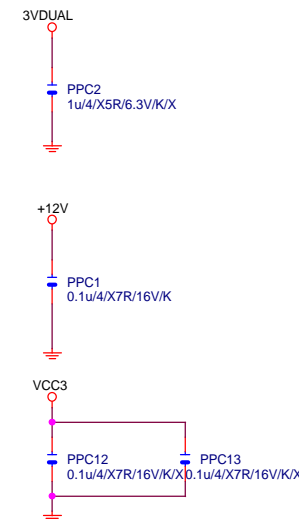
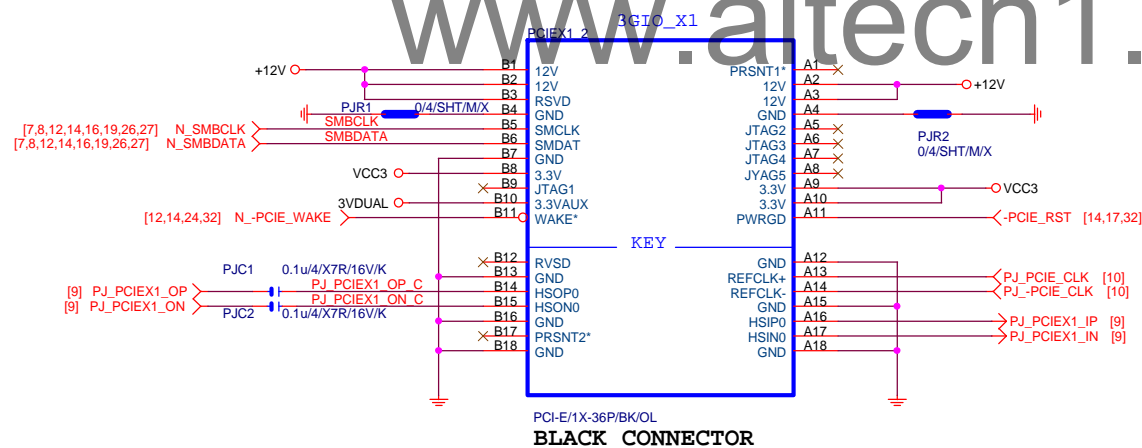
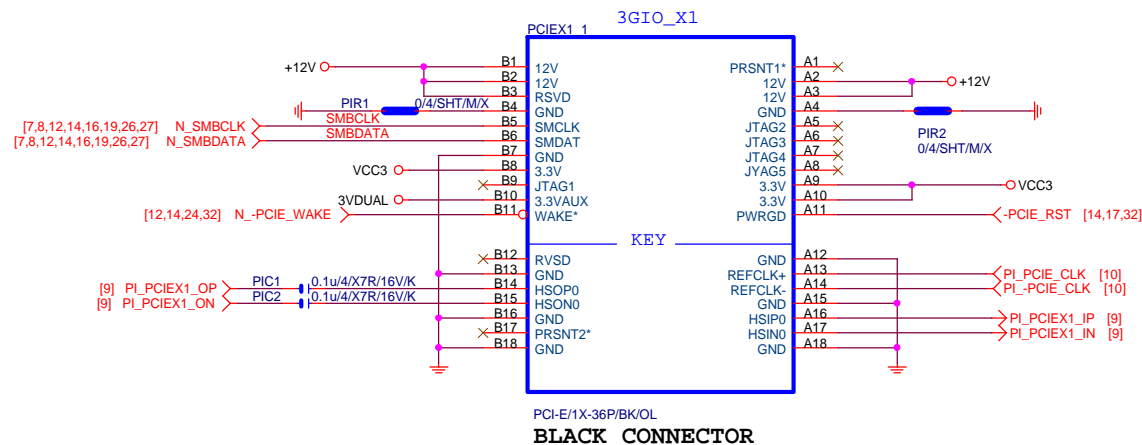


BLACK CONNECTOR

Gigabyte Technology

Title			PCI EXPRESS * 16		
Size			Document Number		
Custom			GA-H87M-HD3		
Date:			Tuesday, July 30, 2013		
Sheet			14 of 32		
Rev			1.1		

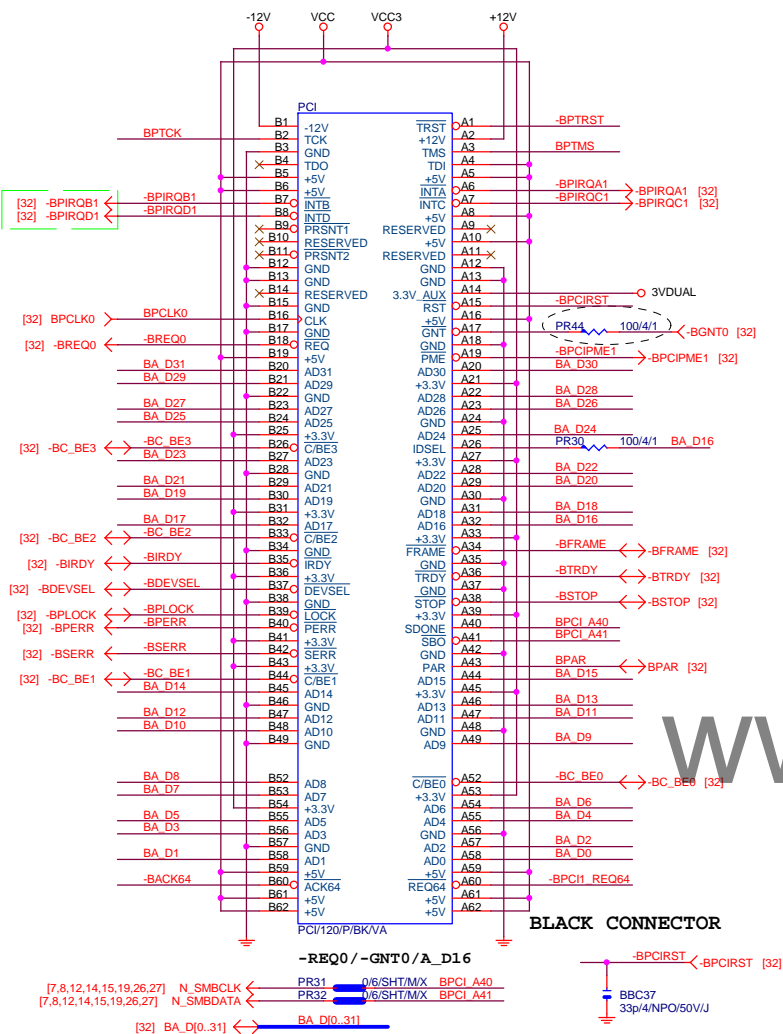
# PCIEX1 SLOT



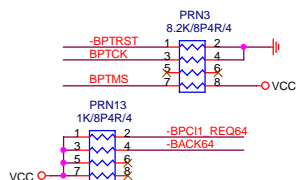
www.aitech1.ru

Gigabyte Technology			
PCI EXPRESS X 1 PORT			
Title	Document Number		
Size Custom	GA-H87M-HD3		
Date:	Tuesday, July 30, 2013	Sheet 15 of 32	Rev 1.1

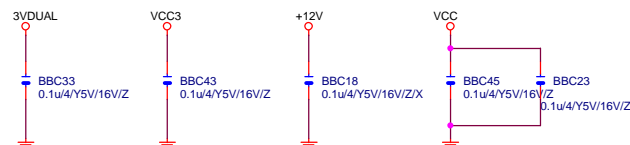
PCI SLOT 1
------------



## PCI PU



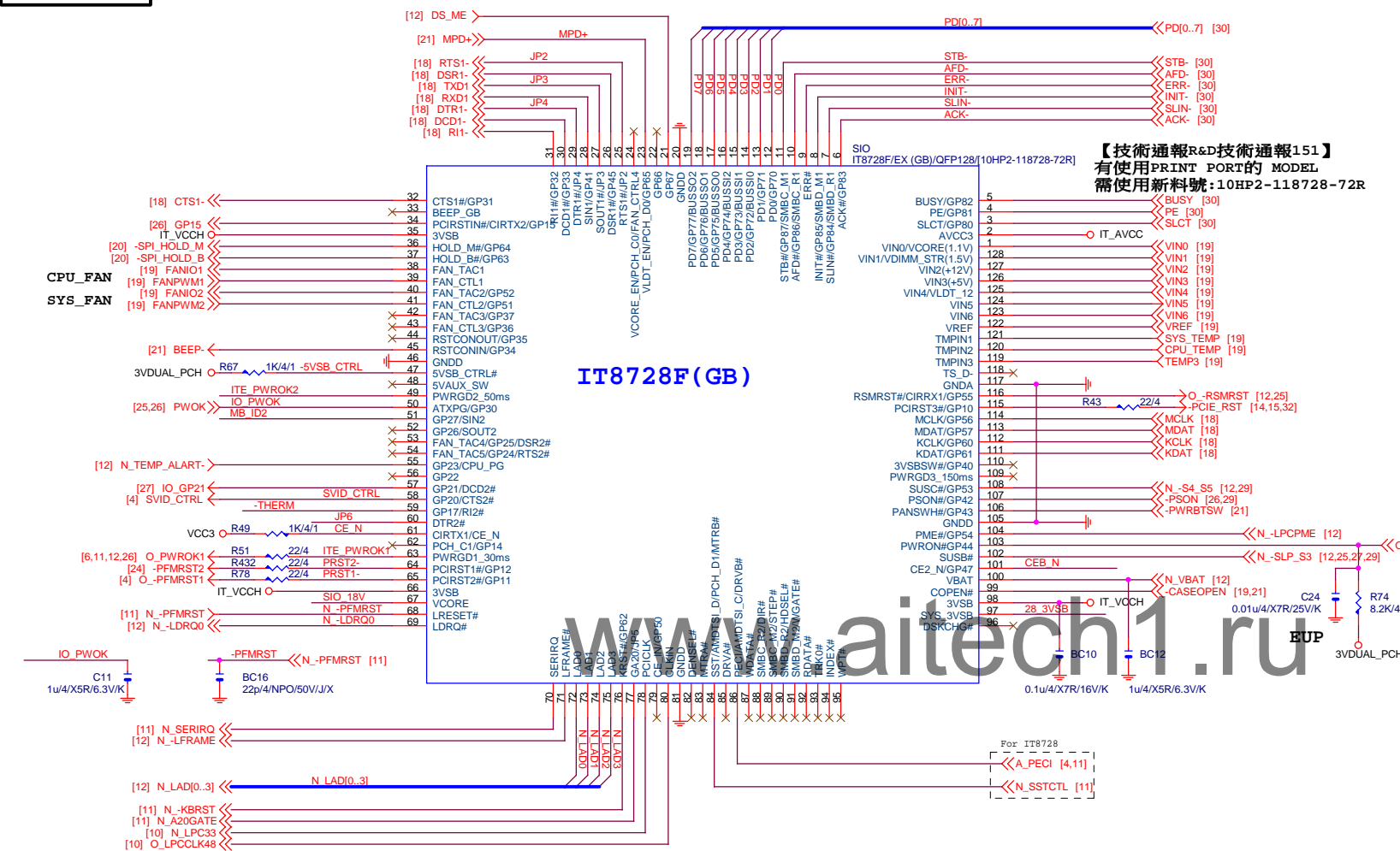
## PCI CAP



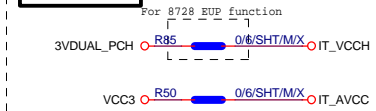
www.aitech1.ru



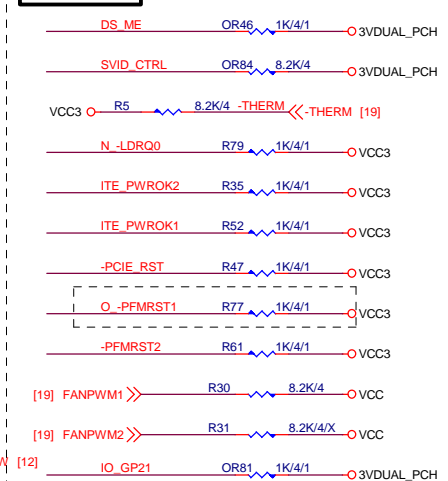
## SIO IT8728F



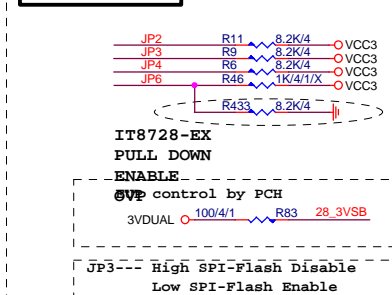
PWR	SHT
-----	-----



SIO	PU
-----	----



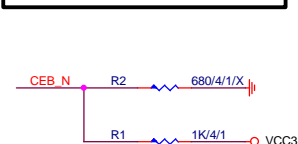
SIO STRAP



## IT8728F NOTE

	IT8728
PIN121	VCORE_EN/PCH_C0
PIN120	VLDT_EN/PCH_D0
PIN19	ATXPG
PIN31	PCCH_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

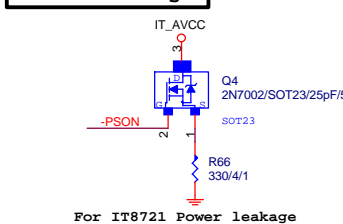
## DUAL BIOS OPT STRAP



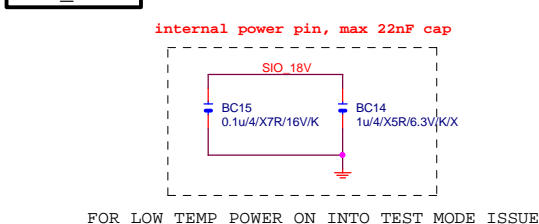
SIO CAP



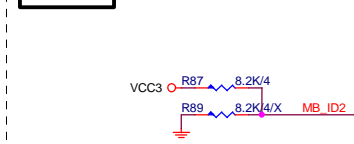
Power leakage



## SIO\_18V



## MB ID

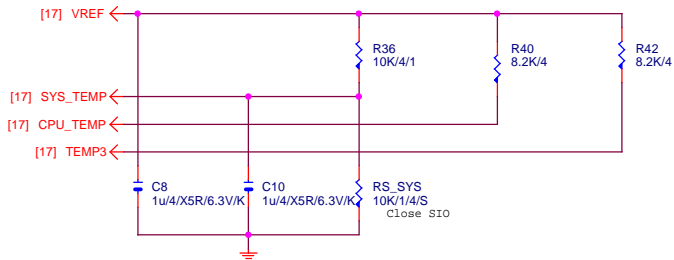


## Gigabyte Technology

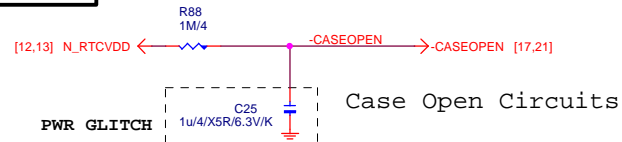
Title		ITE 8728 LPC IO	
Size	Document Number	Rev	
Custom	GA-H87M-HD3	1.1	
Date:	Tuesday, July 30, 2013	Sheet	17 of 32



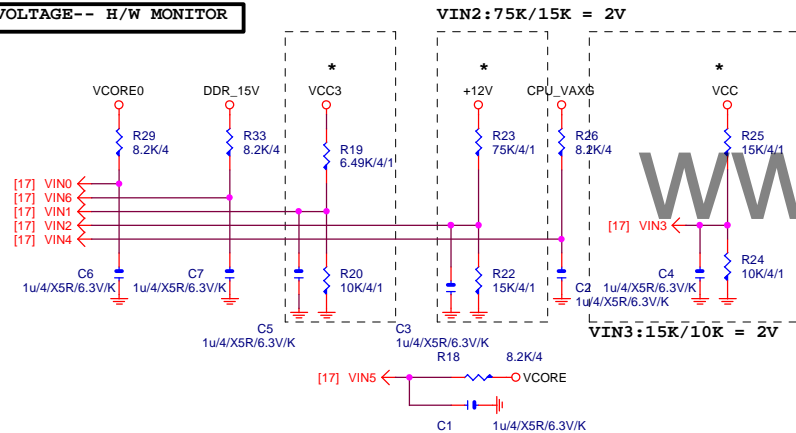
## TEMP H/W MONITOR



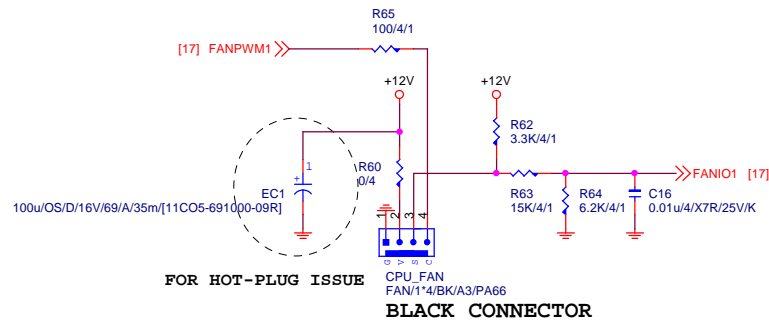
## CASE OPEN



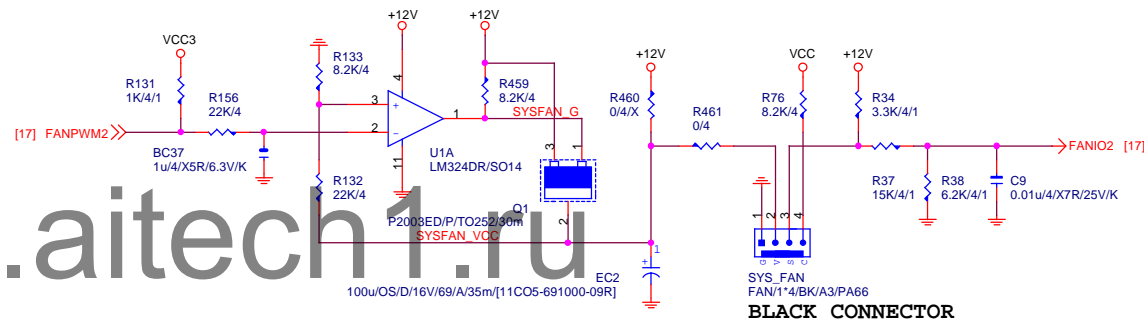
## VOLTAGE-- H/W MONITOR



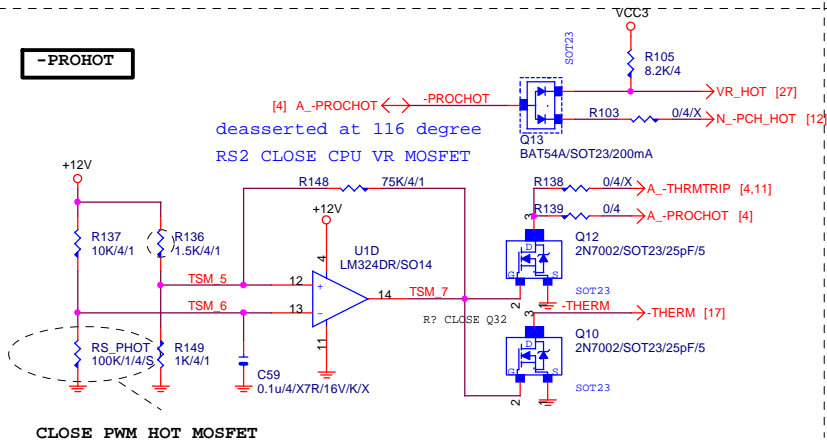
## CPU SMART FAN



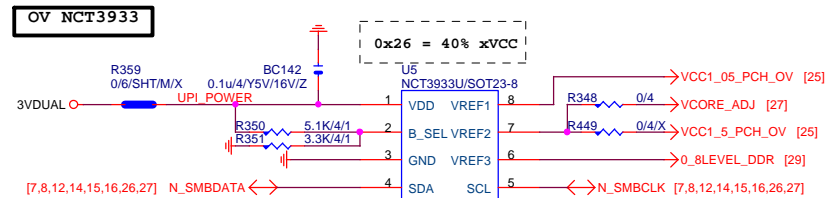
## SYS SMART FAN



## -PROHOT

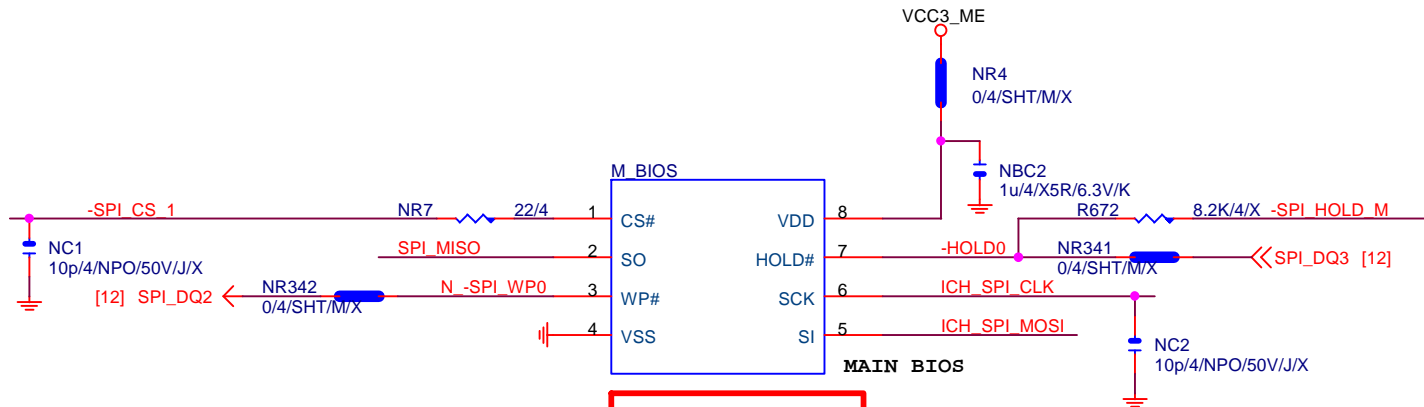


## 接pwm feedback pin

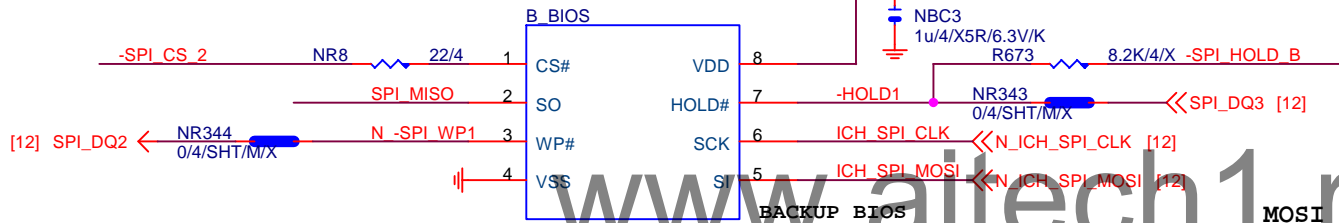


Gigabyte Technology

Title			HWM,FAN CTRL,OV
Size	Document Number	GA-H87M-HD3	
Custom		Rev 1.1	
Date:	Tuesday, July 30, 2013	Sheet	19 of 32



64M/Q/SPI/SO8/S

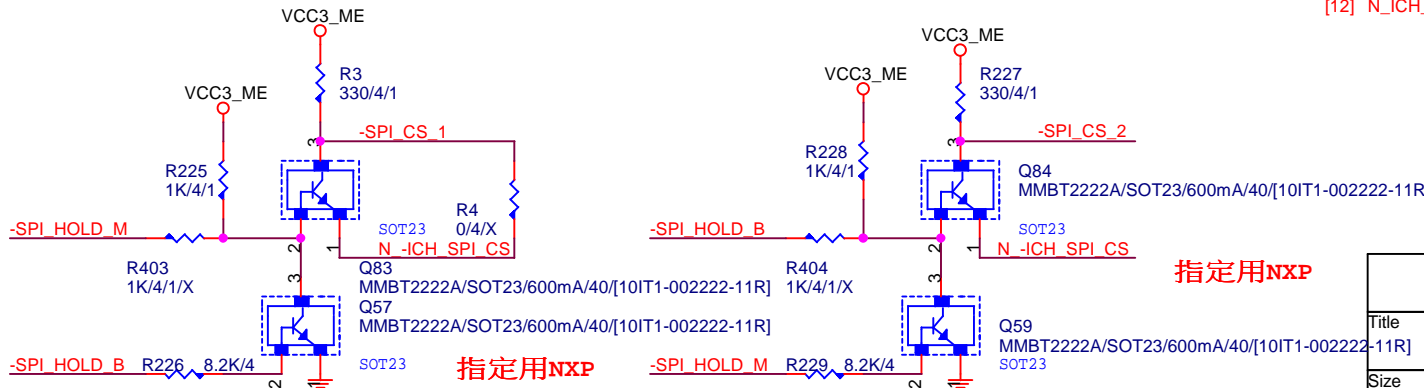
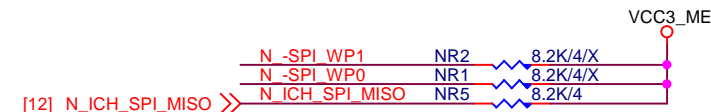
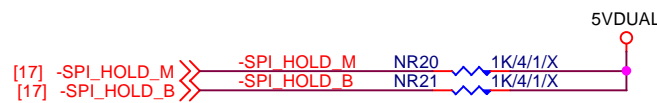
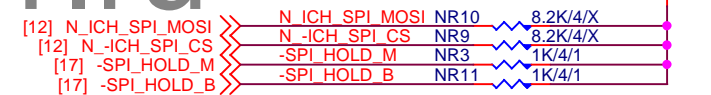


64M/Q/SPI/SO8/S

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

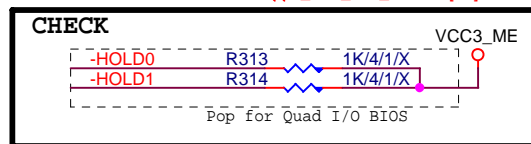
1 means floating  
0 means PD 1K

MOSI For DMI RX Termination Voltage



指定用NXP

指定用NXP



**Gigabyte Technology**

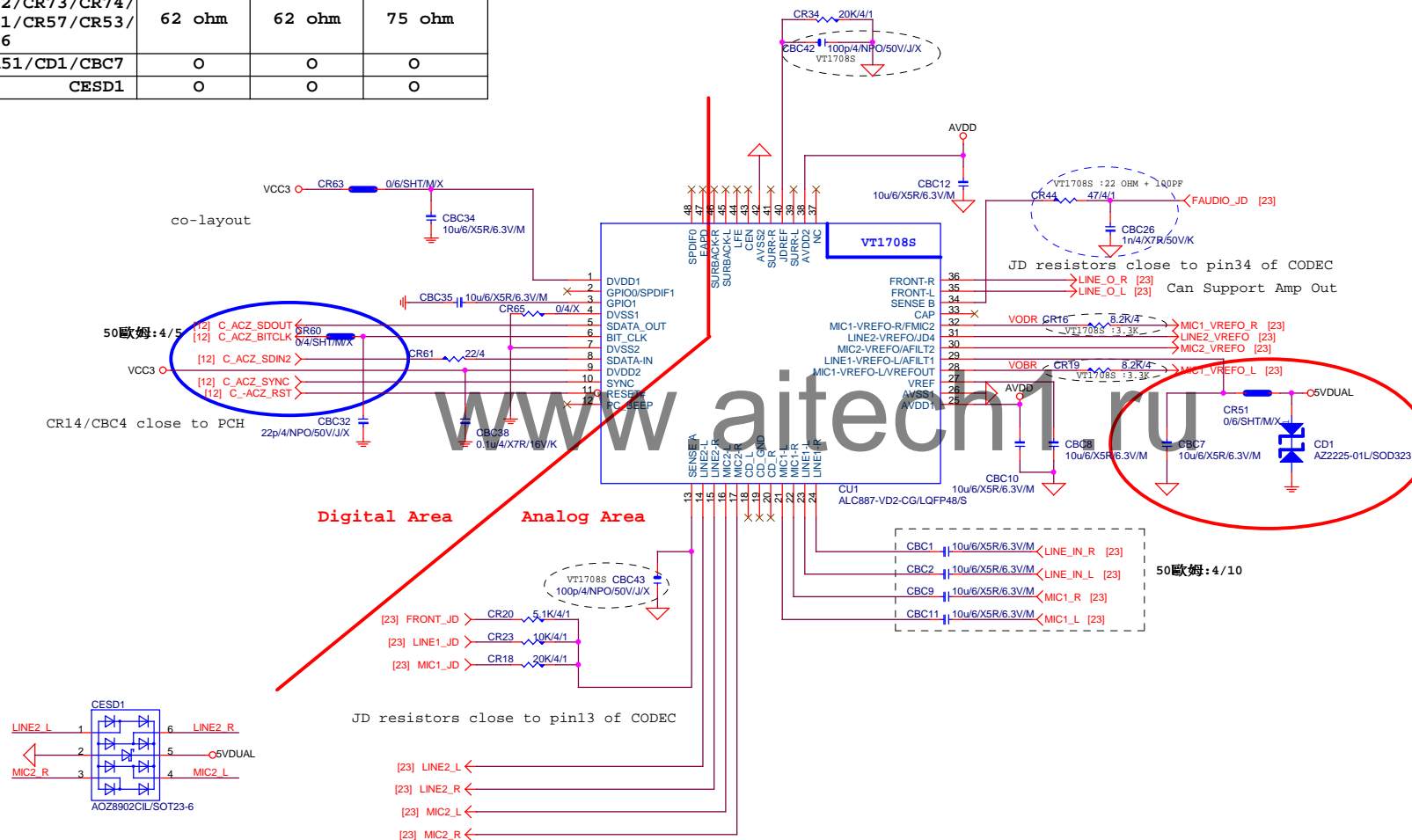
**DUAL BIOS**

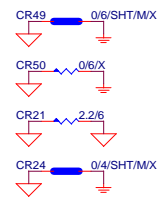
**GA-H87M-HD3**

Title	Document Number		Rev
Size Custom			1.1
Date	Tuesday, July 30, 2013	Sheet	20 of 32

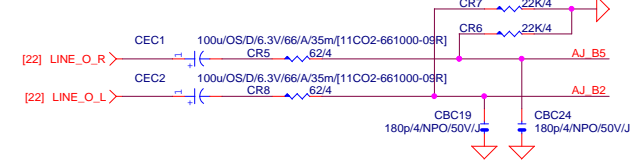


	ALC892	ALC887-VD2	VT1708S-CE
CR44/CBC26	47ohm+1nF	47ohm+1nF	22ohm+100P
CBC42/CBC43	X	X	100P/4
CR6/CR7/CR58/CR54/ CR67/CR68/CR69/CR70	22K/4	22K/4	10K/4/1
CR5/CR8/CR1/CR14/ CR17/CR22/CR73/CR74/ CR13/CR11/CR57/CR53/ CR75/CR76	62 ohm	62 ohm	75 ohm
CR51/CD1/CBC7	O	O	O
CESD1	O	O	O





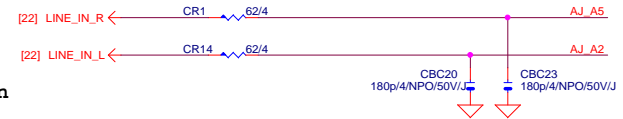
## LINE-OUT



## LINE-IN

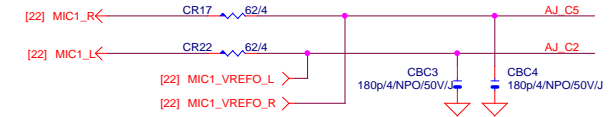
Verify MIC function  
in LINE-in

Only reserved for ALC888



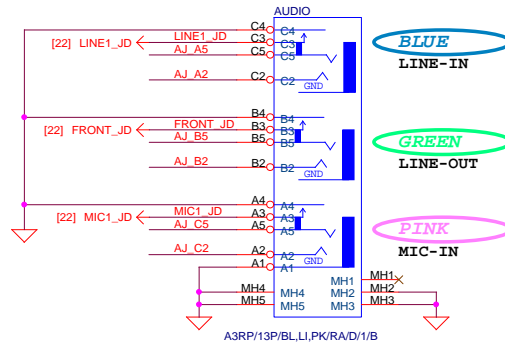
For 889A/888

## MIC-IN

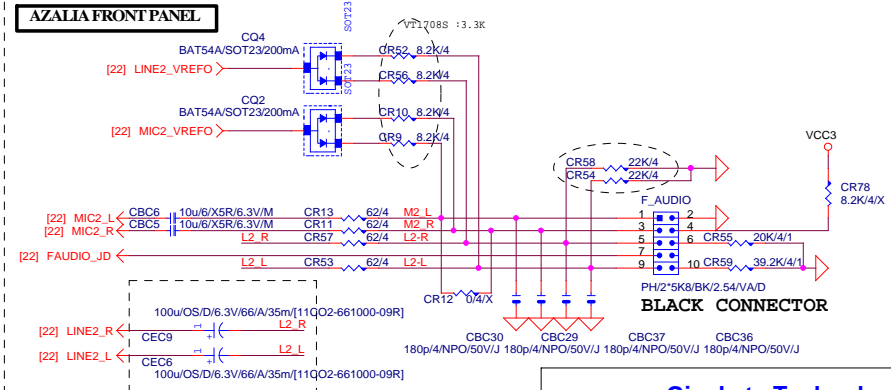


## SPDIF\_OUT

www.aitech1.ru

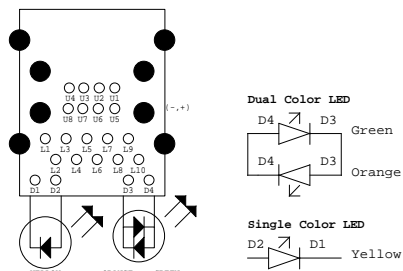
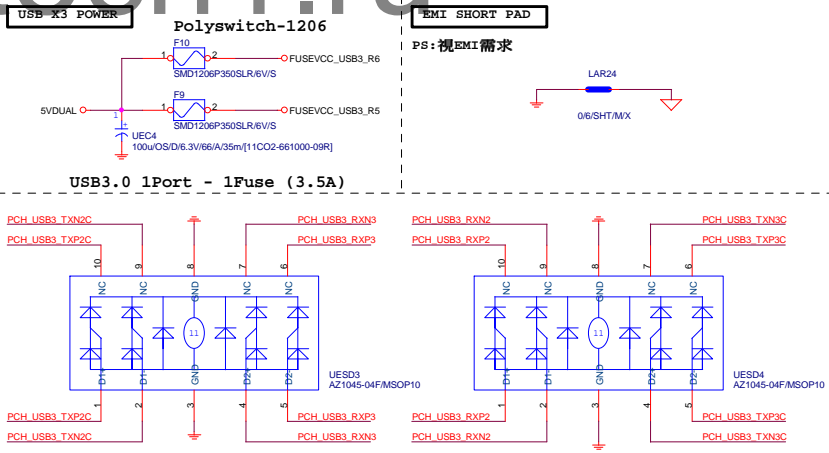
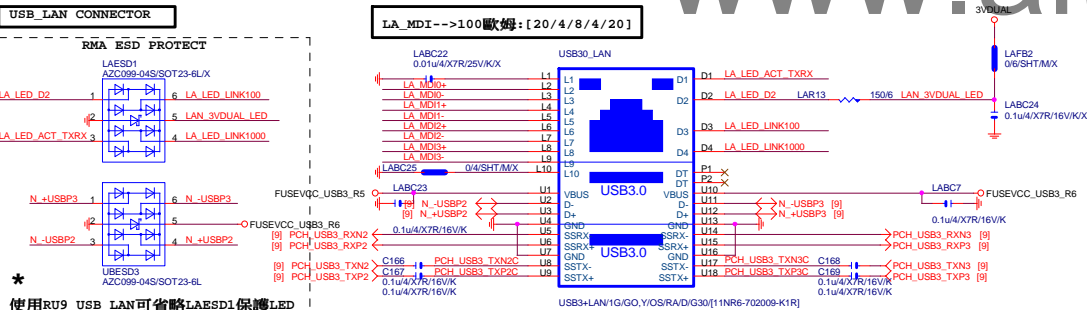
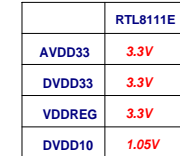
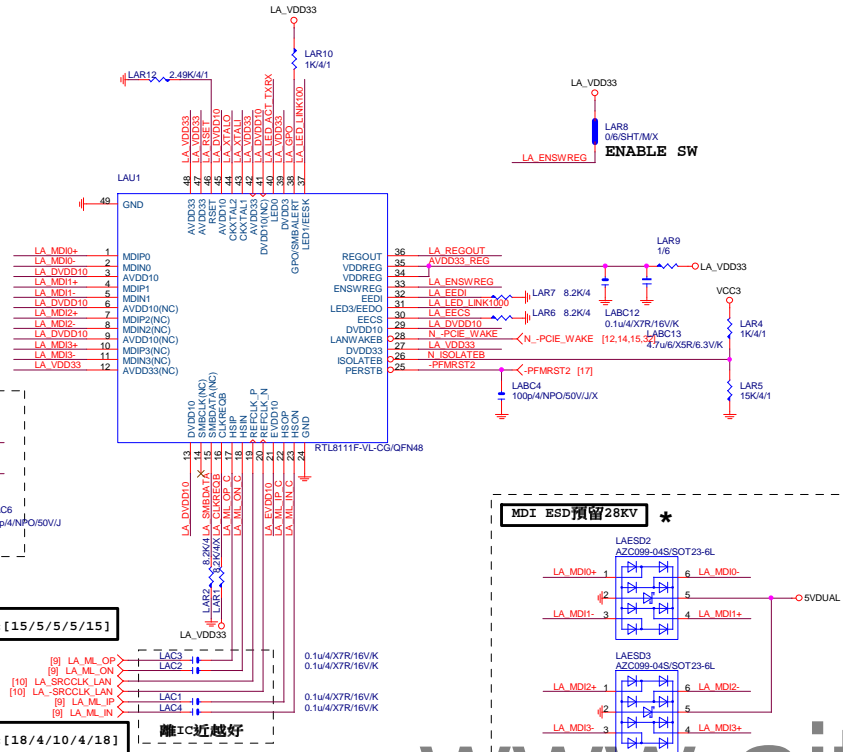


## AZALIA FRONT PANEL



Gigabyte Technology

Title			AUDIO JACK
Size			GA-H87M-HD3
Date:			Tuesday, July 30, 2013
Sheet			23 of 32
Rev			1.1



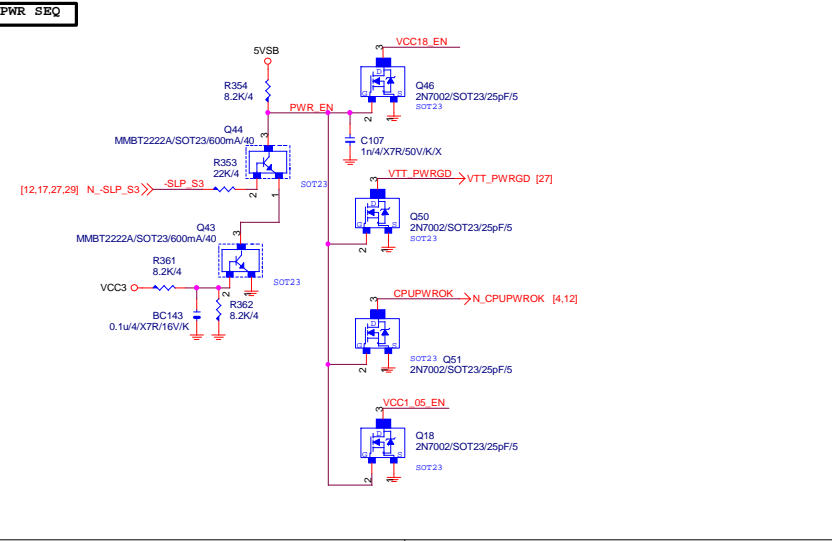
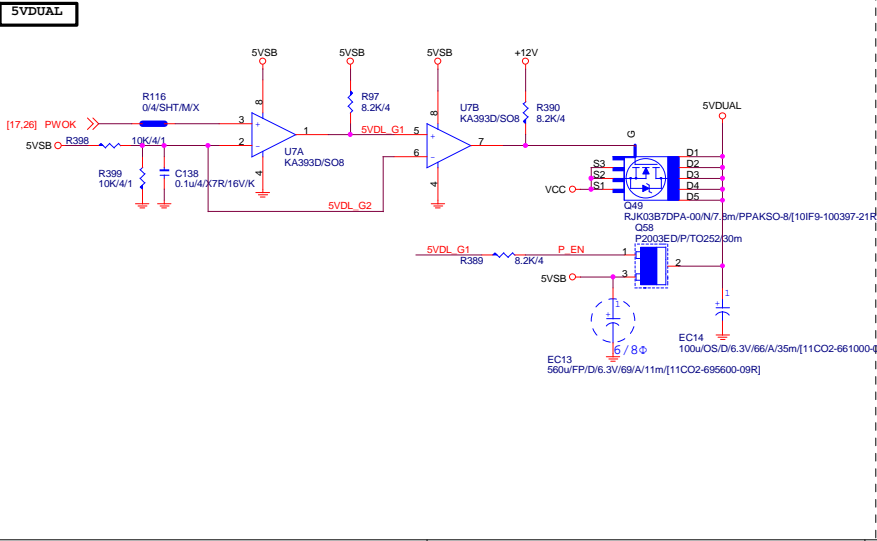
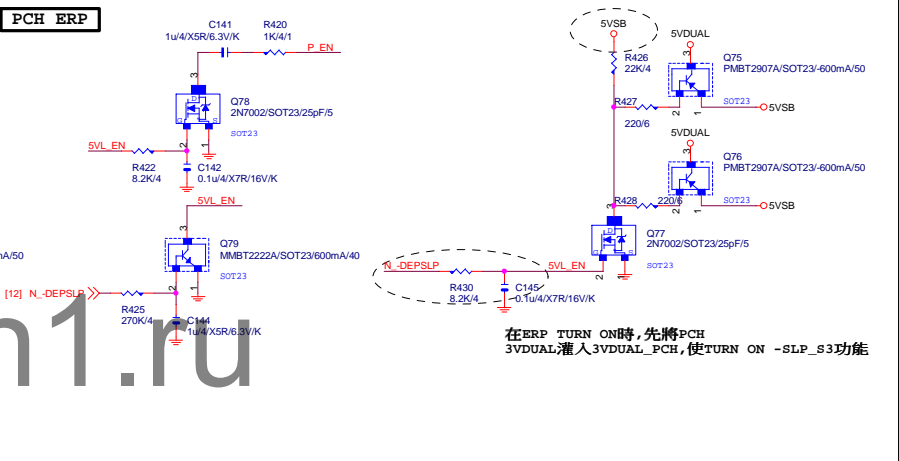
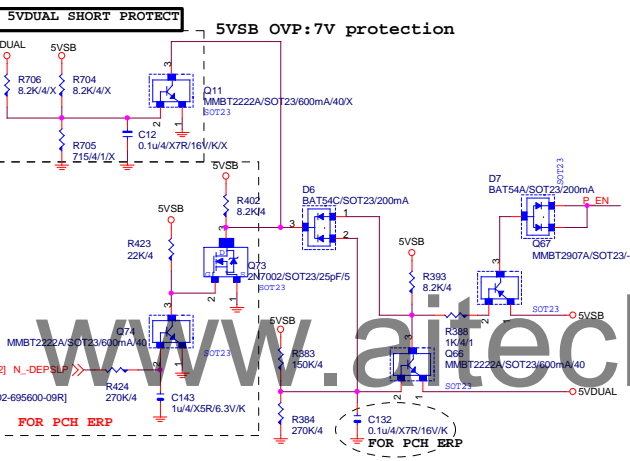
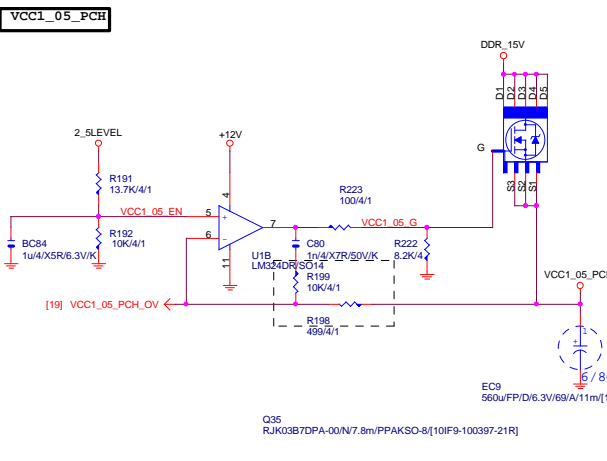
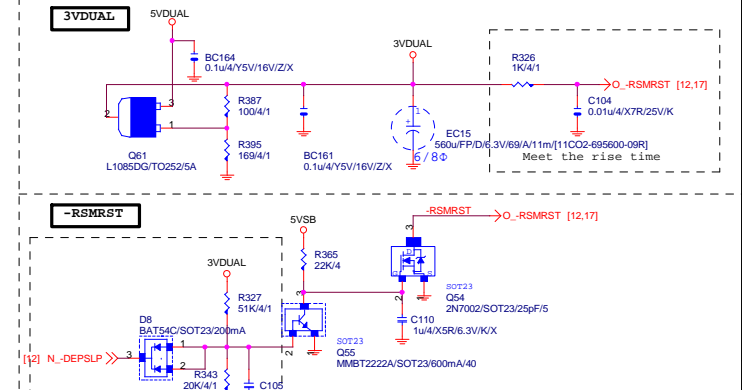
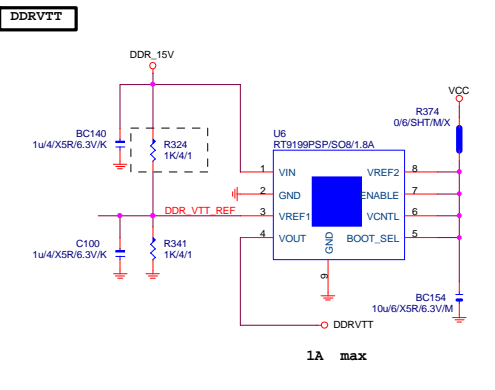
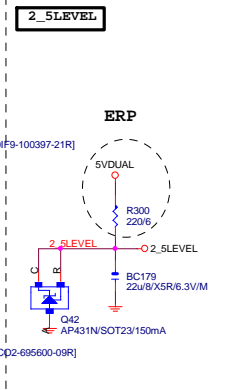
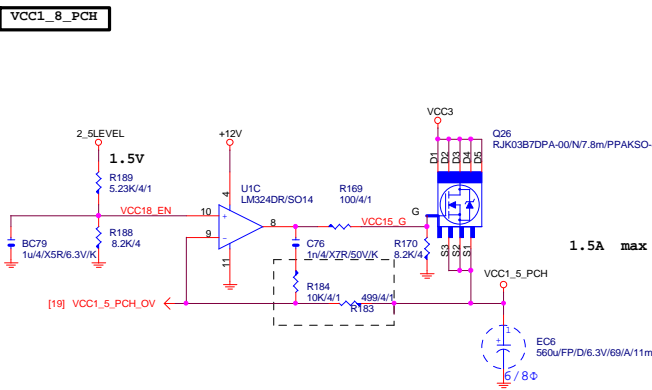
注意:USB PORT(目前:暫代6,7PORT)  
USB-->90歐姆:[15/4.5/7.5/4.5/15]

BOM NOTICE			★		
料號		規格		廠商	
11NR6-702009-96R 1G LAN (12core)				UDE(RU9 ESD+)	
[LED獨立走線, 可省略外加AZC099料件LAESD1]					

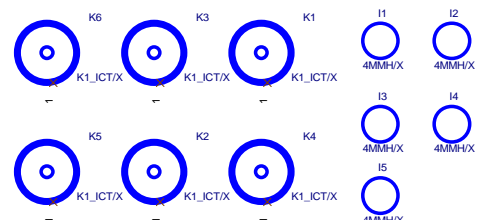
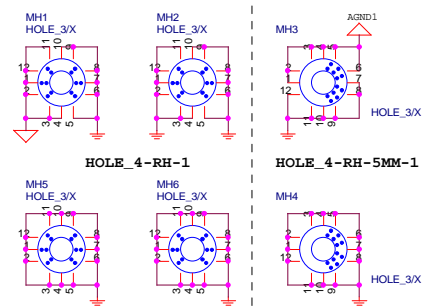
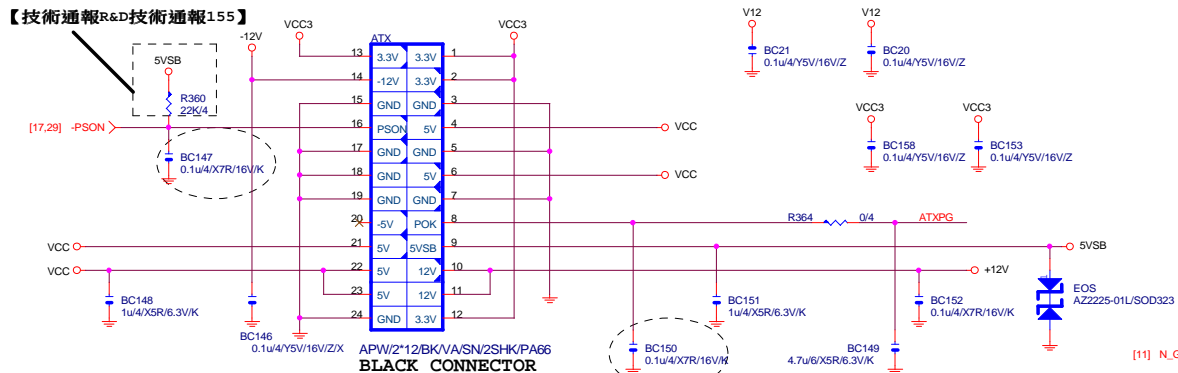
  

1. 9KV ESD BOM: USB_LAN (RU9):11NR6-702009-96R	
2. 28KV ESD BOM: USB_LAN (RU9):11NR6-702009-96R LAESD2, LAESD3: <u>上件</u> AZC398-04S	



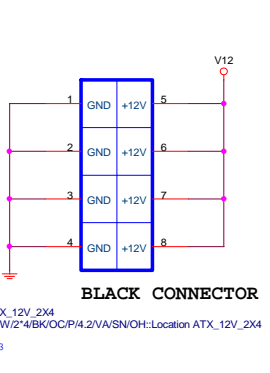
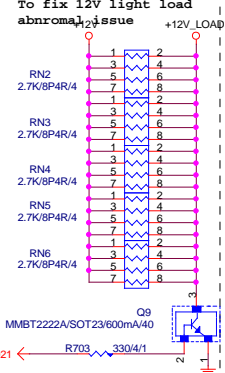


## 【技術通報R&amp;D技術通報155】



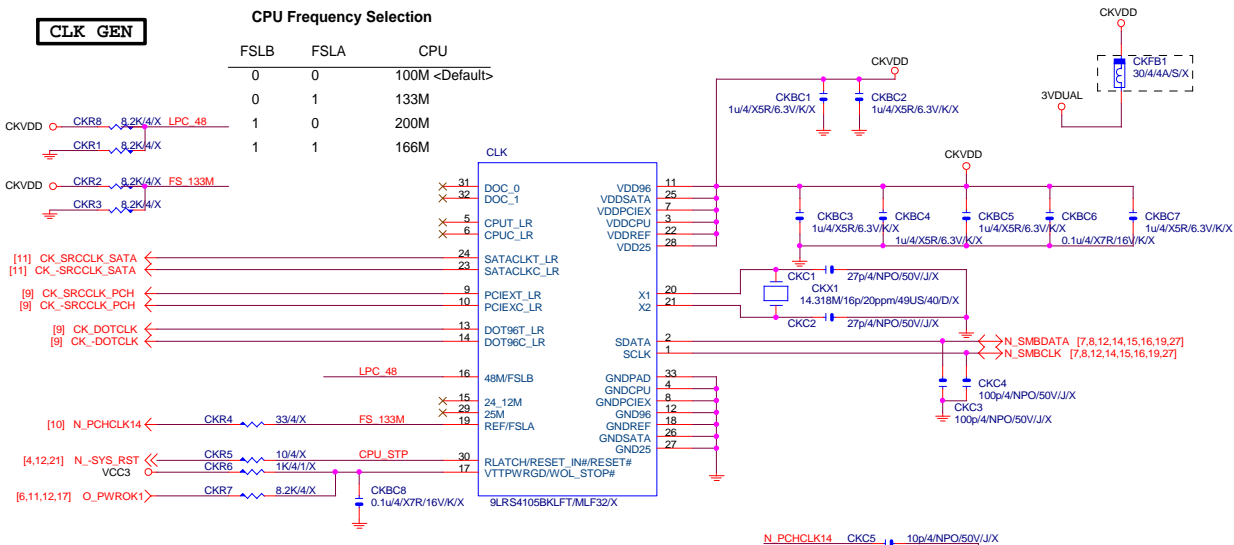
To prevent the 5VSB  
under loading when  
boot

To fix 12V lig.  
abnormal issue

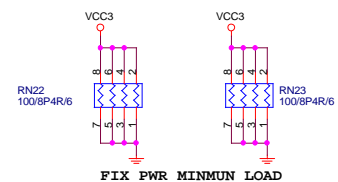
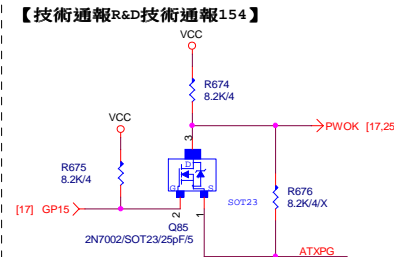


### CPU Frequency Selection

FSLB	FSLA	CPU
0	0	100M <Default>
0	1	133M
1	0	200M
1	1	166M



## 【技術通報R&amp;D技術通報154】

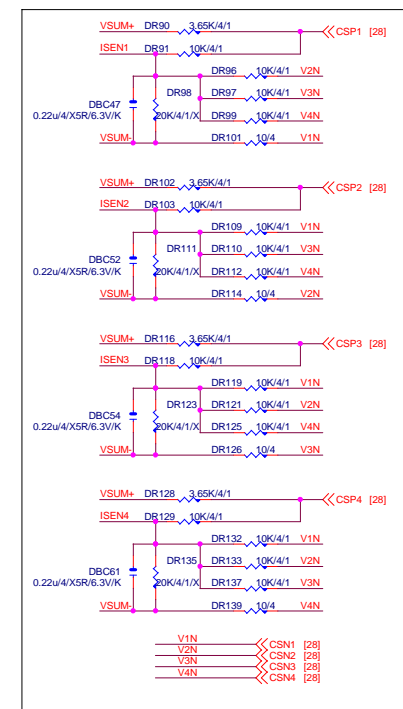


## Gigabyte Technology

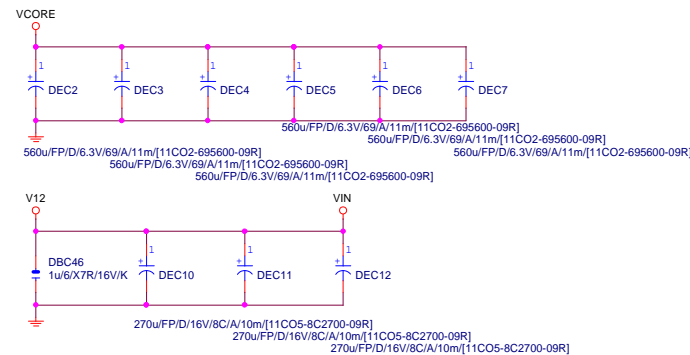
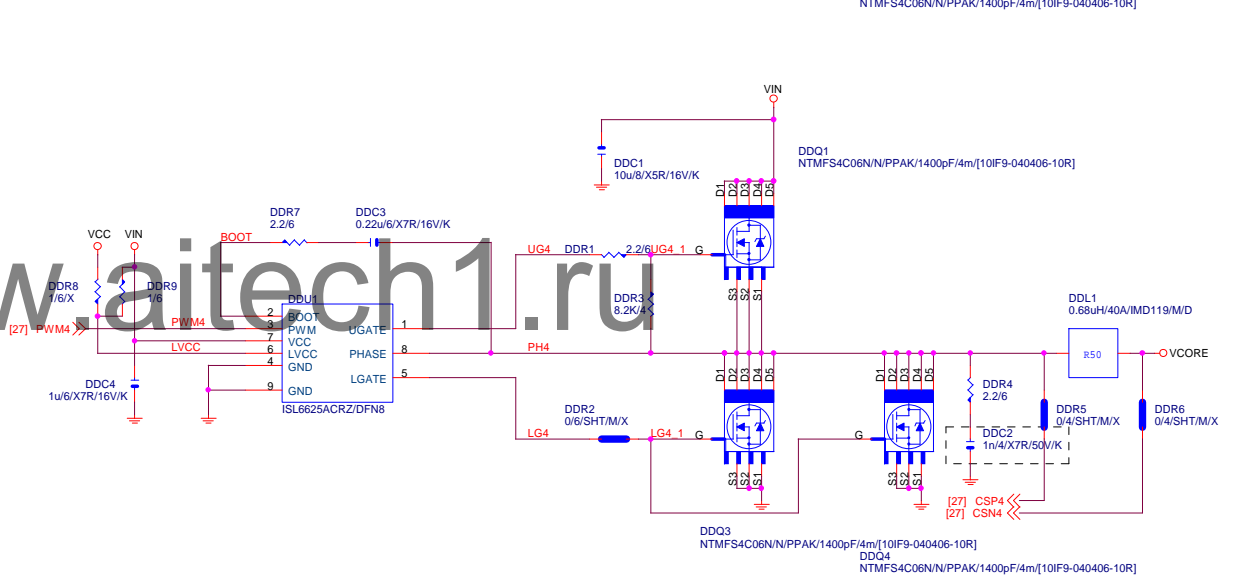
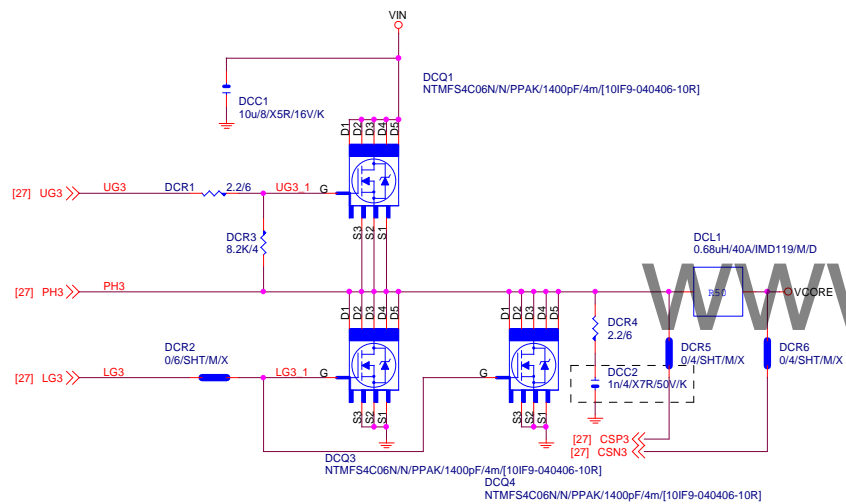
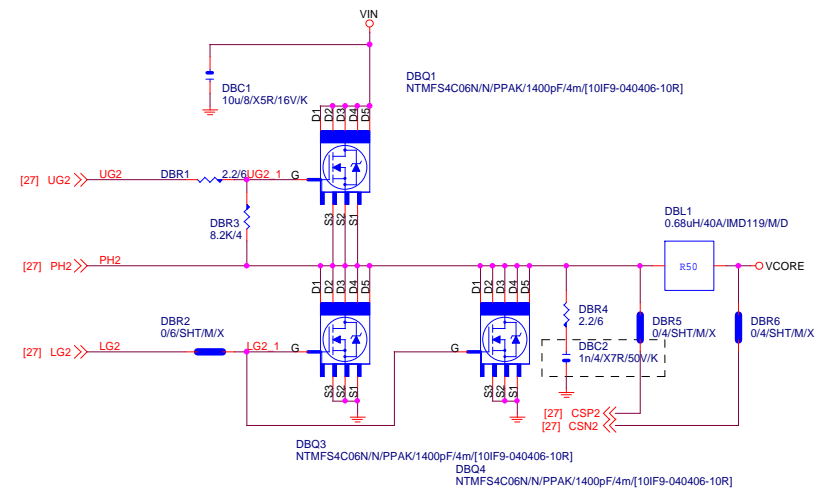
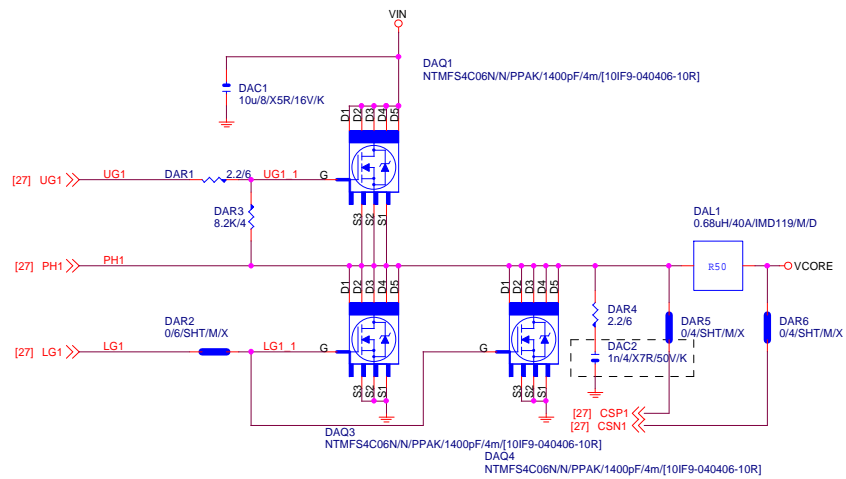
## ATX CONNECTOR

GA-H87M-HD3

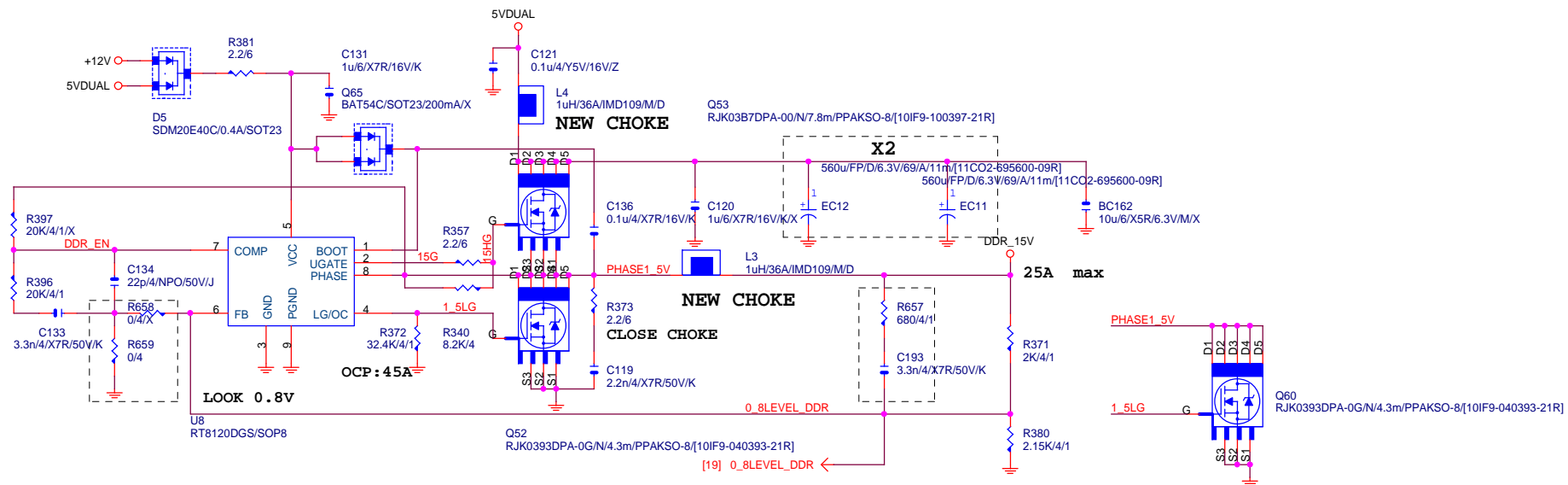
Rev
1.1



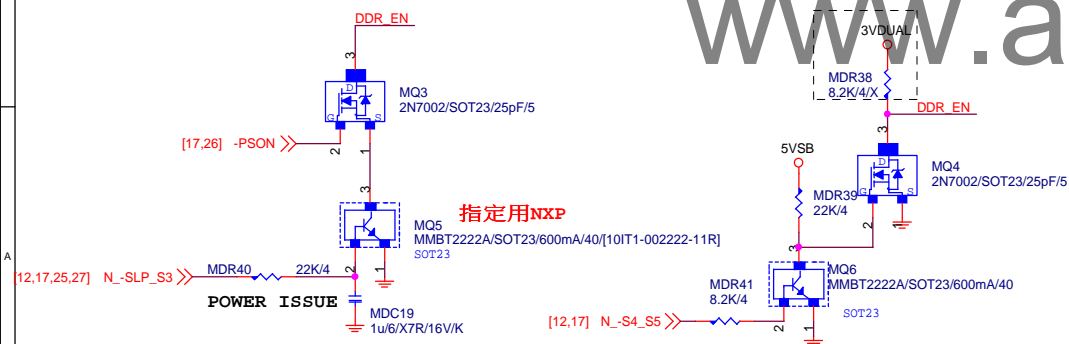
CLOSE PWM



DDR15V



PWR SEQ



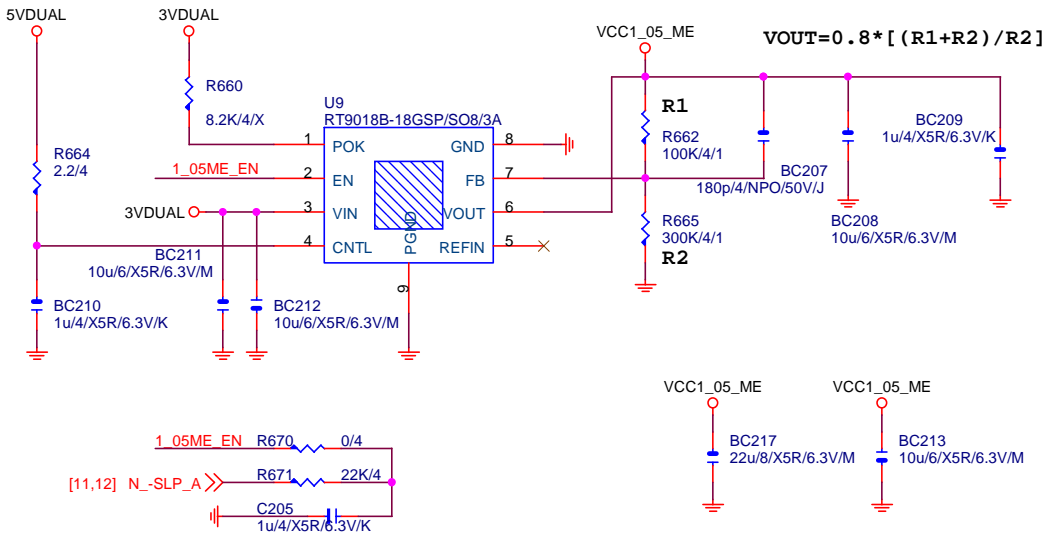
VIN=5V, VOUT=1.5V, IOUT=25A, PHASE=1  
IRMS=11.45A  
560uF/P/D/6.3V/68/8m RIPPLE CURRENT=4.7A  
Coefficient=1.7(85°C), 1(105°C)  
VIN Ripple current=4.7X1.7=7.99A(85°C)  
-->故固態電容須2X7.99=15.98>11.45A

```
Rocset=(Iocp*Lgate,rdson)/Iocset
Rocset=(45A*6.7mOhm)/10uA = 30K
Iocset=10uA
```

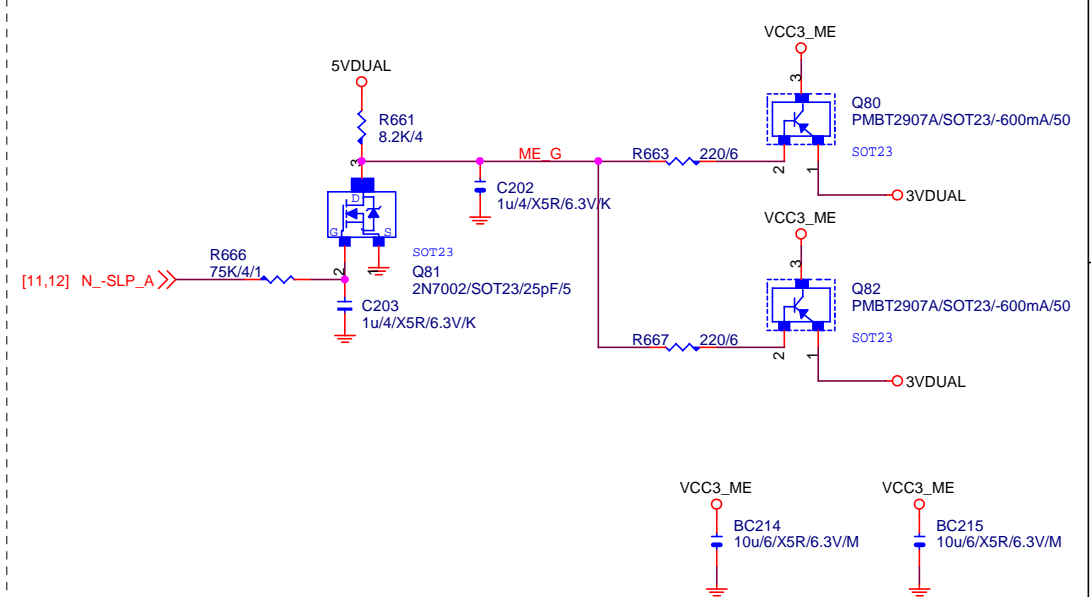
<b><i>Gigabyte Technology</i></b>			
Title			
<b>DDR POWER</b>			
Size	Document Number	<b>GA-H87M-HD3</b>	Rev
Custom			<b>1.1</b>
Date:	Tuesday, July 30, 2013	Sheet	29 of 32

# VCC1\_05\_ME

【技術通報R&D技術通報156】  
(RICHTER), (NUVOTON), (EMC)做共用  
PIN7分壓阻值須做修改為100K以上電阻值

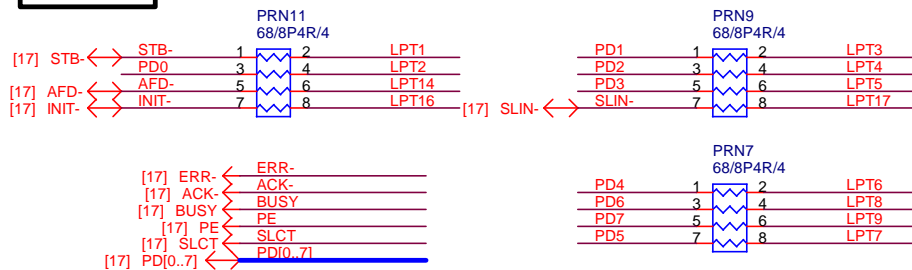


# VCC3\_ME

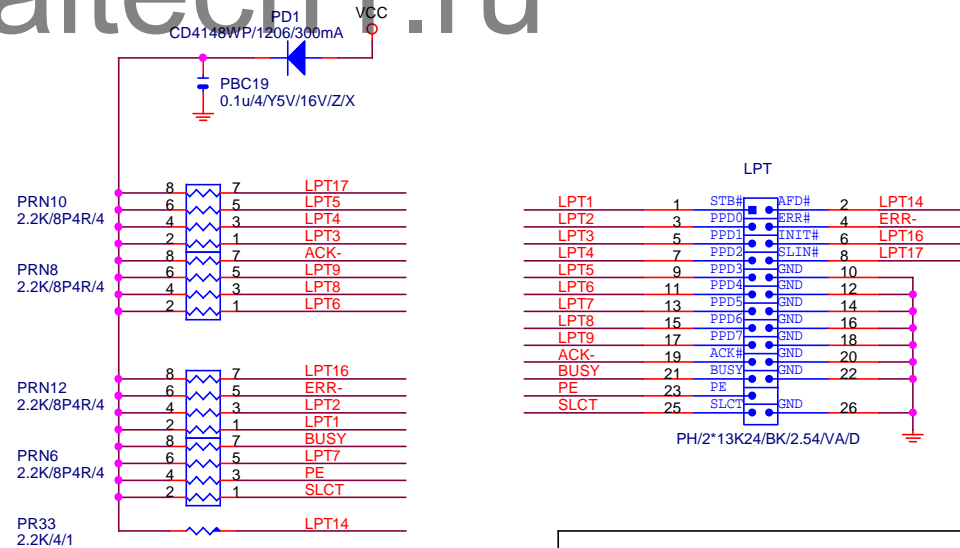


www.aitech1.ru

# LPT PORT

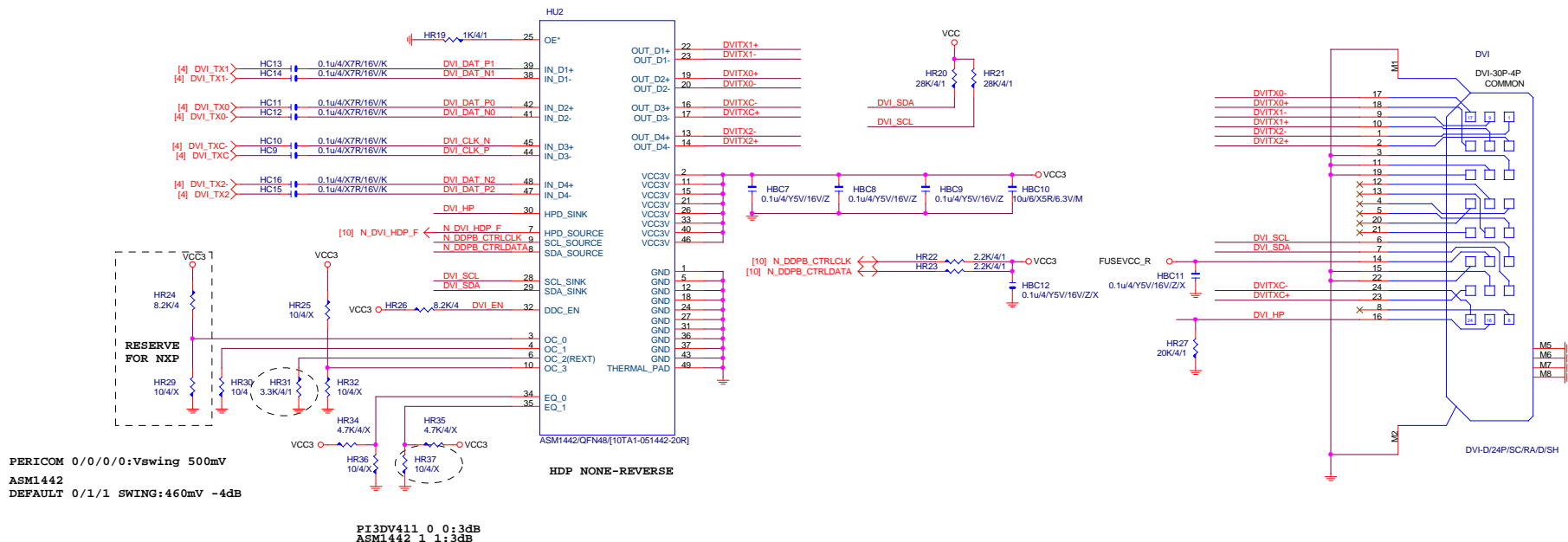


【技術通報R&D技術通報151】  
33ohm Change to 68ohm

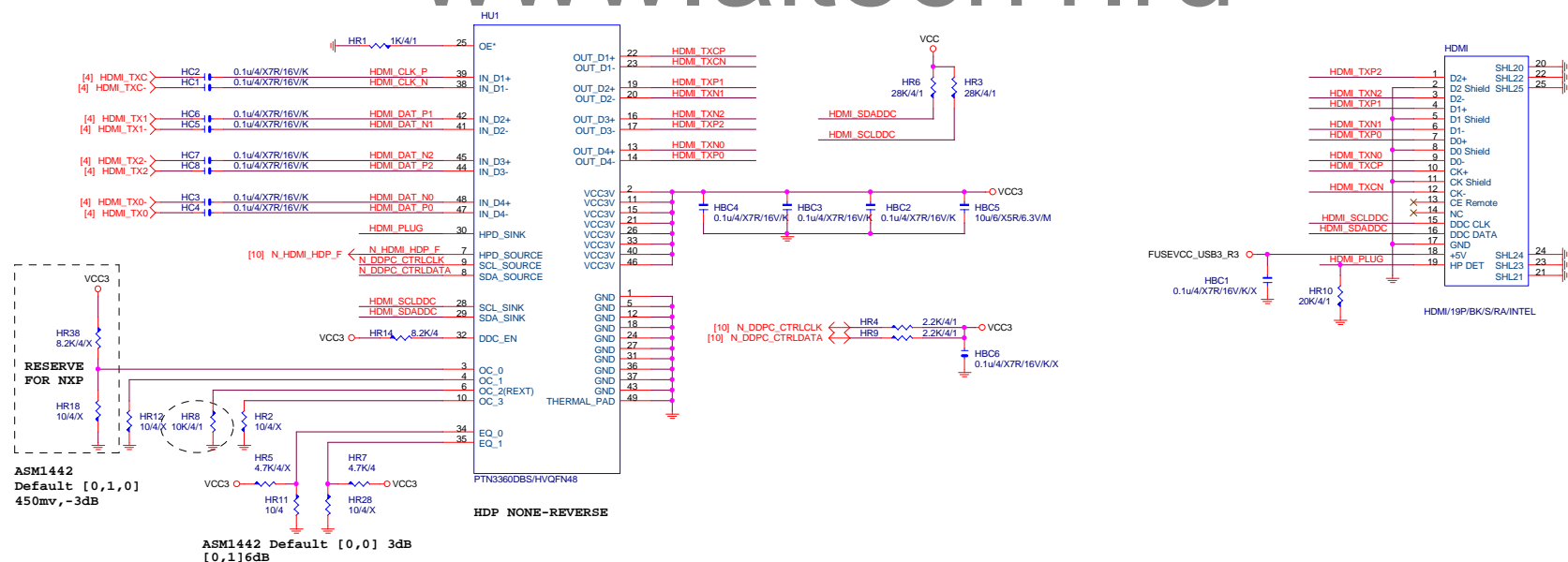


Gigabyte Technology			
Title			
LPT			
Size	Document Number	GA-H87M-HD3	
Custom		Rev 1.1	
Date:	Tuesday, July 30, 2013	Sheet	30 of 32

## DVI LEVEL SHIFT



## HDMI LEVEL SHIFT



【技術通報R&amp;D技術通報150】

HDMI eye diagram1.4版(deep color)會fail

原因：因目前的HDMI訊號過長，造成RISING TIME過慢，而會壓到eye diagram

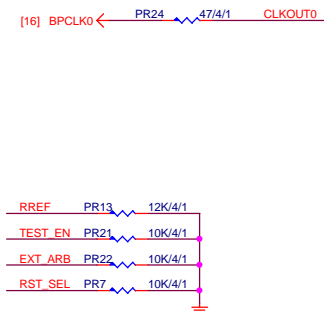
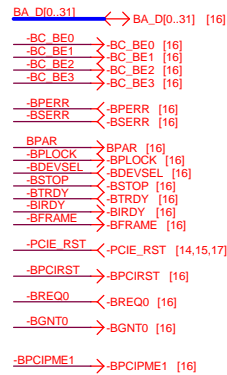
改善: ASMEDIA ASM1442 : 3.16K(PIN6 PULL DOWN電阻) 10ohm(PIN4 PULL DOWN電阻)

## PCIE TO PCI

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

IT8892: PR24 -> 47ohm

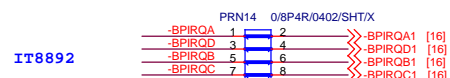
IT8893: PR24 -> 22ohm



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



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



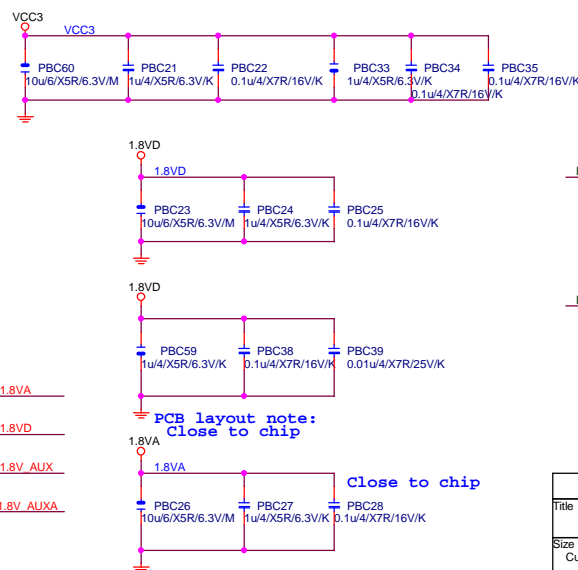
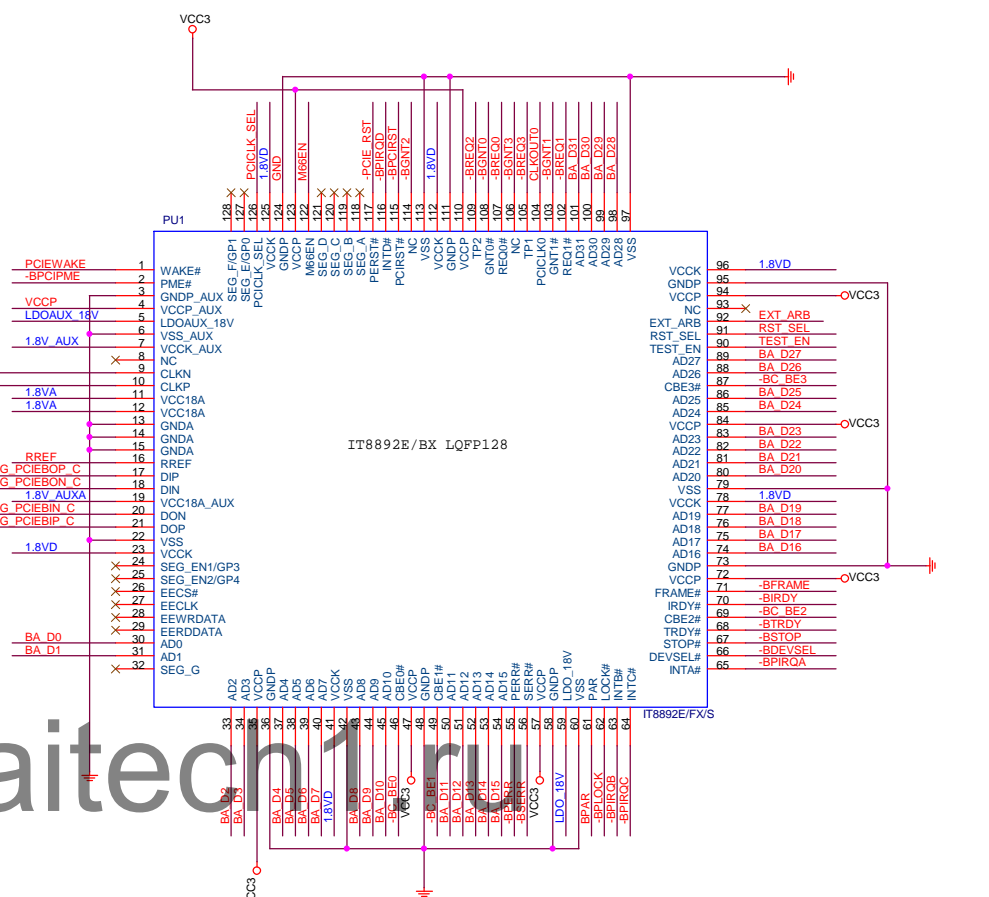
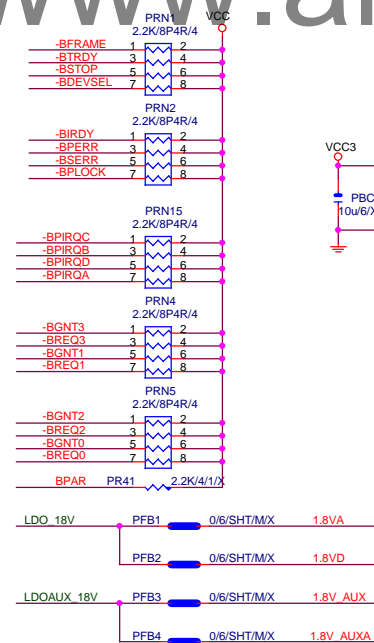
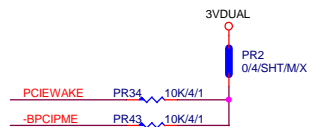
PCI slot



PCI slot


**-BPCIPME1** PR27 **0/4/SHT/M/X** >>N **-PCIE WAKE** [12.14.15.24]

chipset side



PCB layout note:  
Close to chip

## Gigabyte Technology

Title			
<div style="text-align: center;">    <b>ITE IT8892E</b> </div>			
Size	Document Number		Rev
Custom	<b>GA-H87M-HD3</b>		<b>1.1</b>
Date	Tuesday, July 30, 2013	Sheet	32 of 32