

Model Name: GA-H87M-D3H

Revision 1.11

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 1,2
08	DDR III CHANNEL B 1,2
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*4 SLOT
16	PCI SLOT1,2
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 ALC892-GR
23	REAR AUDIO JACK
24	REALTEK RTL8111F
25	DISCRETE POWER
26	ATX , CLOCK GEN, TPM
27	VCORE ISL95820_1

SHEET

TITLE

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

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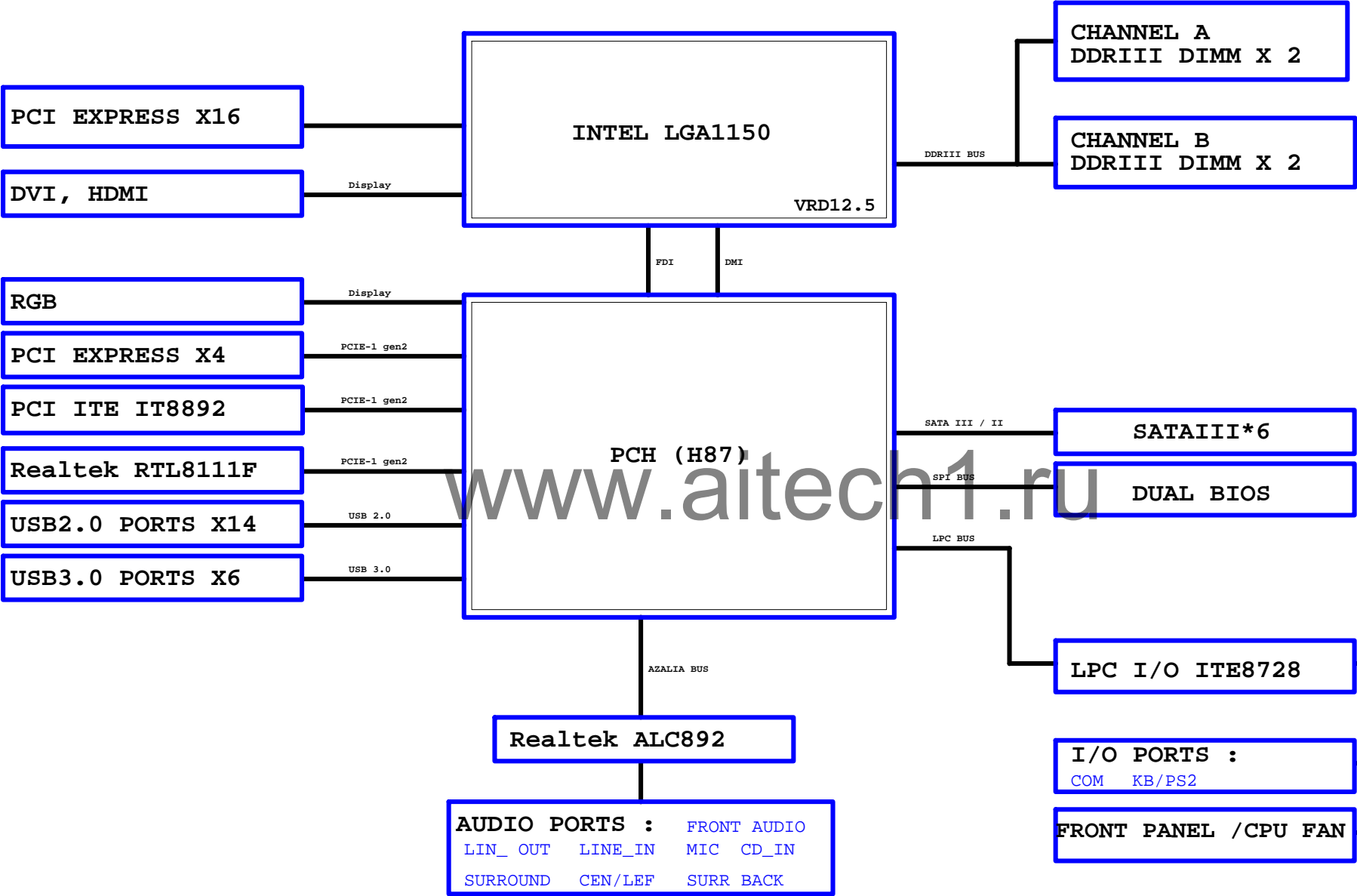
Title			Cover Sheet
Size	Document Number	GA-H87M-D3H	
Custom		Rev	1.11
Date:	Thursday, August 15, 2013	Sheet	1 of 32

Circuit or PCB layout change

2013/08/15

[illegible][illegible]

BLOCK DIAGRAM



[illegible][illegible]

PCIEX16:16/5/5/16(breakout min 10/4/4/4/10)					
Impedance=80 +- 1.5%					
LGAI1500C					
PA EXP RXP0	F15	PEG_RXP0	A12	PA EXP TXP0	
PA EXP RXN0	F19	PEG_RXN0	B12	PA EXP TXN0	
PA EXP RXP1	D14	PEG_RXP1	B11	PA EXP TXP1	
PA EXP RXN1	E14	PEG_RXN1	C11	PA EXP TXN1	
PA EXP RXP2	E13	PEG_RXP2	C10	PA EXP TXP2	
PA EXP RXN2	F13	PEG_RXN2	D10	PA EXP TXN2	
PA EXP RXP3	D12	PEG_RXP3	B9	PA EXP TXP3	
PA EXP RXN3	E12	PEG_RXN3	C9	PA EXP TXN3	
PA EXP RXP4	E11	PEG_RXP4	C8	PA EXP TXP4	
PA EXP RXN4	F11	PEG_RXN4	D8	PA EXP TXN4	
PA EXP RXP5	G10	PEG_RXP5	B7	PA EXP TXP5	
PA EXP RXN5	G10	PEG_RXN5	C7	PA EXP TXN5	
PA EXP RXP6	E9	PEG_RXP6	A6	PA EXP TXP6	
PA EXP RXN6	F9	PEG_RXN6	B6	PA EXP TXN6	
PA EXP RXP7	F8	PEG_RXP7	B5	PA EXP TXP7	
PA EXP RXN7	G8	PEG_RXN7	C5	PA EXP TXN7	
PA EXP RXP8	D3	PEG_RXP8	E1	PA EXP TXP8	
PA EXP RXN8	D4	PEG_RXN8	F2	PA EXP TXN8	
PA EXP RXP9	E4	PEG_RXP9	F3	PA EXP TXP9	
PA EXP RXN9	E5	PEG_RXN9	F2	PA EXP TXN9	
PA EXP RXP10	F5	PEG_RXP10	G1	PA EXP TXP10	
PA EXP RXN10	F6	PEG_RXN10	G2	PA EXP TXN10	
PA EXP RXP11	G4	PEG_RXP11	H2	PA EXP TXP11	
PA EXP RXN11	G5	PEG_RXN11	J1	PA EXP TXN11	
PA EXP RXP12	H5	PEG_RXP12	J1	PA EXP TXP12	
PA EXP RXN12	H6	PEG_RXN12	K2	PA EXP TXN12	
PA EXP RXP13	J4	PEG_RXP13	K2	PA EXP TXP13	
PA EXP RXN13	J5	PEG_RXN13	M3	PA EXP TXN13	
PA EXP RXP14	K5	PEG_RXP14	M2	PA EXP TXP14	
PA EXP RXN14	K6	PEG_RXN14	L3	PA EXP TXN14	
PA EXP RXP15	L4	PEG_RXP15	L1	PA EXP TXP15	
PA EXP RXN15	L5	PEG_RXN15	L2	PA EXP TXN15	
(1.011V)					
al Voltage					
Core Voltage					
(1.050V)					
Voltage(0.923V)					
gen(0.815V)					
(1.35V)					
[9] A DMI_0RXP0	A DMI_0RXP	U3		A44	A DMI_0TXP
[9] A DMI_0RXN0	A DMI_0RXN	T3		A45	A DMI_0TXN
[9] A DMI_1RXP1	A DMI_1RXP	U1		A43	A DMI_1TXP
[9] A DMI_1RXN1	A DMI_1RXN	V1		A44	A DMI_1TXN
[9] A DMI_2RXP2	A DMI_2RXP	W2		A45	A DMI_2TXP
[9] A DMI_2RXN2	A DMI_2RXN	X2		A44	A DMI_2TXN
[9] A DMI_3RXP3	A DMI_3RXP	Y3		A41	A DMI_3TXP
[9] A DMI_3RXN3	A DMI_3RXN	W5		A42	A DMI_3TXN
	X D1	RSVD_TP			
	X C2	RSVD_TP			
	X B3	RSVD_TP			
	X A4	RSVD_TP			
W=12 mil out of CPU					
S=15 mil out of CPU					
VCCIOA_L0-WR15	24.9/41	GRCOMP	P3		
USE RCOMP					
HASWELL10SC1-F01150-01R 10SC1-F01150-03RI					

3V DUAL

WR27 1K4/1/X

WR45 8.2K4/X

WR26 2004/1/X

VCC3

1.1V分壓

A_CPURST

WR31 1004/1/X

WBC3 1n4/X7R

O_PFMRST1

SOT23

MMBT2222A/SOT23/600mA/40/X

WQ1

WQ2

CPU_VTT_OR

Timing diagram for CPU_VTT_0R. The diagram shows the relationship between the CPU_VTT_0R signal and various system signals. The signals are:

- WR14: 514/1/X
- WR16: 514/1/X
- WR17: 514/1/X
- WR30: 514/1
- WR11: 514/1
- WR9: 514/1
- WR29: 1K4/1/X
- WR10: 1K4/1/X
- WR25: 1K4/1
- WR56: 514/1/X
- WR55: 1K4/1/X

The signals are connected to the following system signals:

- A_TMS
- A_TDI
- A_HPRDY
- A_TCK
- A_TRST
- A_PECI
- A_GATERR
- A_PROCHOT
- N_CPUWPBCK

DDR_15V

WR62
100k/1

WR60
100k/1

WC3
0.1uF/X7R/16V/K

A SM_VREF

LGA1150 (A)

MAAA0	AU13	DDR0_MA0	DDR0_D00	AD38	MDA0
MAAA1	AV16	DDR0_MA1	DDR0_D01	AD39	MDA1
MAAA2	AU16	DDR0_MA2	DDR0_D02	AF38	MDA2
MAAA3	AW17	DDR0_MA3	DDR0_D03	AF39	MDA3
MAAA4	AU17	DDR0_MA4	DDR0_D04	AD37	MDA4
MAAA5	AW18	DDR0_MA5	DDR0_D05	AD40	MDA5
MAAA6	AV17	DDR0_MA6	DDR0_D06	AE37	MDA6
MAAA7	AT18	DDR0_MA7	DDR0_D07	AF40	MDA7
MAAA8	AU18	DDR0_MA8	DDR0_D08	AH40	MDA9
MAAA9	AT19	DDR0_MA9	DDR0_D09	AH39	MDA10
MAAA10	AW11	DDR0_MA10	DDR0_D10	AK38	MDA10
MAAA11	AV19	DDR0_MA11	DDR0_D11	AK39	MDA11
MAAA12	AU19	DDR0_MA12	DDR0_D12	AH37	MDA12
MAAA13	AY10	DDR0_MA13	DDR0_D13	AH38	MDA13
MAAA14	AT20	DDR0_MA14	DDR0_D14	AK37	MDA14
MAAA15	AU21	DDR0_MA15	DDR0_D15	AK40	MDA15
MODT_A0	AW10	DDR0_ODT0	DDR0_D16	AM40	MDA17
MODT_A1	AY8	DDR0_ODT1	DDR0_D17	AM39	MDA21
MODT_A2	AW9	DDR0_ODT2	DDR0_D18	AP38	MDA18
MODT_A3	AU8	DDR0_ODT3	DDR0_D19	AP39	MDA19
			DDR0_D20	AM37	MDA20
			DDR0_D21	AM38	MDA16
			DDR0_D22	AP37	MDA22
			DDR0_D23	AP40	MDA23
			DDR0_D24	AW37	MDA29
			DDR0_D25	AU35	MDA26
			DDR0_D26	AU35	MDA27
			DDR0_D27	AT37	MDA28
			DDR0_D28	AU37	MDA24
			DDR0_D29	AT35	MDA30
			DDR0_D30	AW35	MDA31
			DDR0_D31	AY6	MDA33
			DDR0_D32	AU6	MDA37
			DDR0_D33	AW4	MDA34
			DDR0_D34	AW4	MDA35
			DDR0_D35	AW6	MDA32
			DDR0_D36	AW4	MDA38
			DDR0_D37	AW4	MDA39
			DDR0_D38	AR1	MDA41
			DDR0_D39	AR4	MDA45
			DDR0_D40	AN3	MDA42
			DDR0_D41	AN4	MDA43
			DDR0_D42	AR2	MDA44
			DDR0_D43	AR3	MDA40
			DDR0_D44	AN2	MDA46
			DDR0_D45	AN1	MDA47
			DDR0_D46	AL1	MDA49
			DDR0_D47	AL4	MDA53
			DDR0_D48	AL4	MDA50
			DDR0_D49	AJ4	MDA51
			DDR0_D50	AL2	MDA52
			DDR0_D51	AL3	MDA48
			DDR0_D52	AJ2	MDA54
			DDR0_D53	AJ1	MDA55
			DDR0_D54	AG1	MDA57
			DDR0_D55	AG4	MDA61
			DDR0_D56	AE3	MDA58
			DDR0_D57	AE4	MDA59
			DDR0_D58	AG2	MDA60
			DDR0_D59	AG3	MDA56
			DDR0_D60	AE2	MDA62
			DDR0_D61	AE1	MDA63
			DDR0_D62	AE39	DQSA0
			DDR0_D63	AJ39	DQSA1
			DDR0_D64	AN39	DQSA2
			DDR0_D65	AV36	DQSA3
			DDR0_D66	AV5	DQSA4
			DDR0_D67	AP3	DQSA5
			DDR0_D68	AK3	DQSA6
			DDR0_D69	AF3	DQSA7
			DDR0_D70	AV32	
			DDR0_D71	AE38	DQSA0
			DDR0_D72	AJ38	DQSA1
			DDR0_D73	AN38	DQSA2
			DDR0_D74	AJ36	DQSA3
			DDR0_D75	AW5	DQSA4
			DDR0_D76	AP2	DQSA5
			DDR0_D77	AK2	DQSA6
			DDR0_D78	AF2	DQSA7
			DDR0_D79	AU32	

LGA1150A

RSVD

DDR0_RAS*

DDR0_WE*

RSVD

RSVD

RSVD

DDR0_CAS*

DDR_RESET

HASWELL[10SC1-F01150-01R_10SC1-F01150-03R]

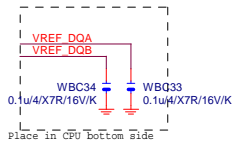
LGA1150 (B)

MAAB0	AL19	DDR1_MA0	AE34	MD80
MAAB1	AK23	DDR1_MA1	AE35	MD81
MAAB2	AM22	DDR1_MA2	AG35	MD82
MAAB3	AM23	DDR1_MA3	AH35	MD83
MAAB4	AP23	DDR1_MA4	AD34	MD84
MAAB5	AL23	DDR1_MA5	AD35	MD85
MAAB6	AY24	DDR1_MA6	AG34	MD86
MAAB7	AV25	DDR1_MA7	AH34	MD87
MAAB8	AU26	DDR1_MA8	AL34	MD88
MAAB9	AW25	DDR1_MA9	AL35	MD89
MAAB10	AP18	DDR1_MA10	AL31	MD810
MAAB11	AY25	DDR1_MA11	AL31	MD811
MAAB12	AV26	DDR1_MA12	AK34	MD812
MAAB13	AR15	DDR1_MA13	AK35	MD813
MAAB14	AV27	DDR1_MA14	AK32	MD814
MAAB15	AY28	DDR1_MA15	AL32	MD815
MODT_B0	AM17	DDR1_ODT0	AP34	MD817
MODT_B1	AL16	DDR1_ODT1	AP34	MD821
MODT_B2	AM16	DDR1_ODT2	AP31	MD819
MODT_B3	AK15	DDR1_ODT3	AP35	MD820
			AP35	MD816
			AP32	MD818
			AP32	MD822
			AP29	MD825
			AP28	MD828
			AP29	MD827
			AP28	MD830
			AL28	MD824
			AL28	MD829
			AP29	MD826
			AP28	MD831
			AP12	MD832
			AP12	MD833
			AL13	MD834
			AL12	MD835
			AP13	MD836
			AP13	MD837
			AM13	MD838
			AM12	MD839
			AR9	MD845
			AP9	MD841
			AR6	MD847
			AP6	MD843
			AR10	MD844
			AP10	MD840
			AR7	MD846
			AP7	MD842
			AM9	MD852
			AL9	MD853
			AL6	MD850
			AL7	MD855
			AM10	MD848
			AL10	MD849
			AM6	MD854
			AM7	MD851
			AH6	MD861
			AH7	MD860
			AE6	MD859
			AE7	MD863
			AJ6	MD856
			AJ7	MD857
			AF6	MD858
			AF7	MD862
			AF35	DQSB0
			AL33	DQSB1
			AP33	DQSB2
			AN28	DQSB3
			AN12	DQSB4
			AP8	DQSB5
			AL8	DQSB6
			AG7	DQSB7
			AN25	
			AE34	DQSB0
			AK33	DQSB1
			AN33	DQSB2
			AN29	DQSB3
			AN13	DQSB4
			AR8	DQSB5
			AM8	DQSB6
			AG6	DQSB7
			AN26	

LGA1150B

DDR_VREF_DQ0

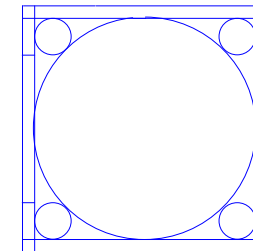
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HASWELL[10SC1-F01150-01R_10SC1-F01150-03R]

LGA1150 (CR)

CR
CPU RETAINTION/X



LGA1150_P



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

DDR BUS

[7] MODT_A[0..3] ↔ MODT_A0..3

[8] MODT_B[0..3] ↔ MODT_B0..3

[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

Gigabyte Technology

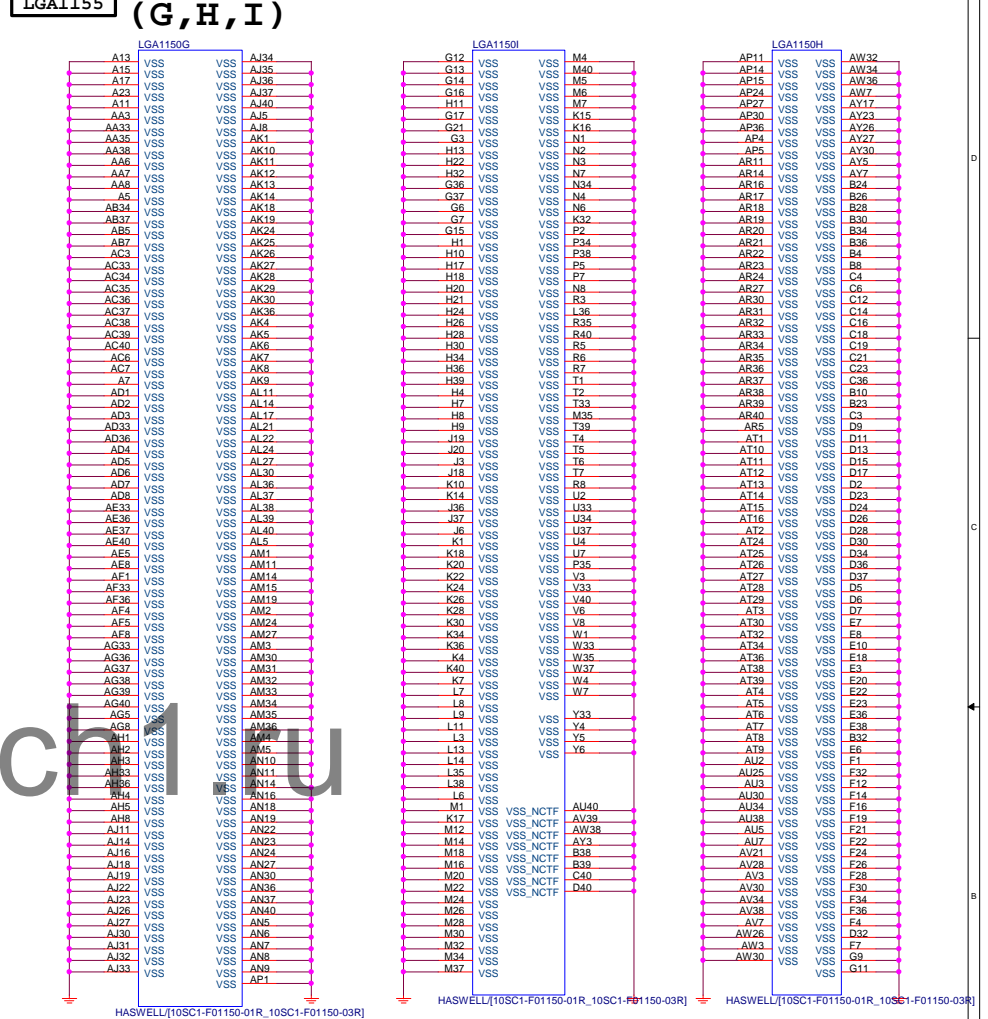
CPU LGA1150-B

GA-H87M-D3H

Rev 1.1

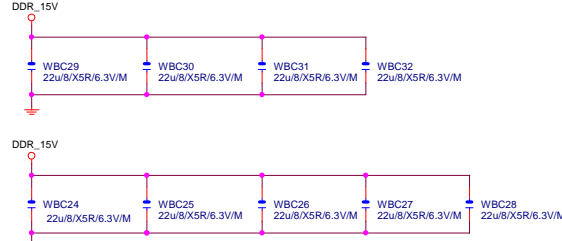
Date: Thursday, August 15, 2013 Sheet 5 of 32

LGA1155 (G,H,I)



DDR CAP

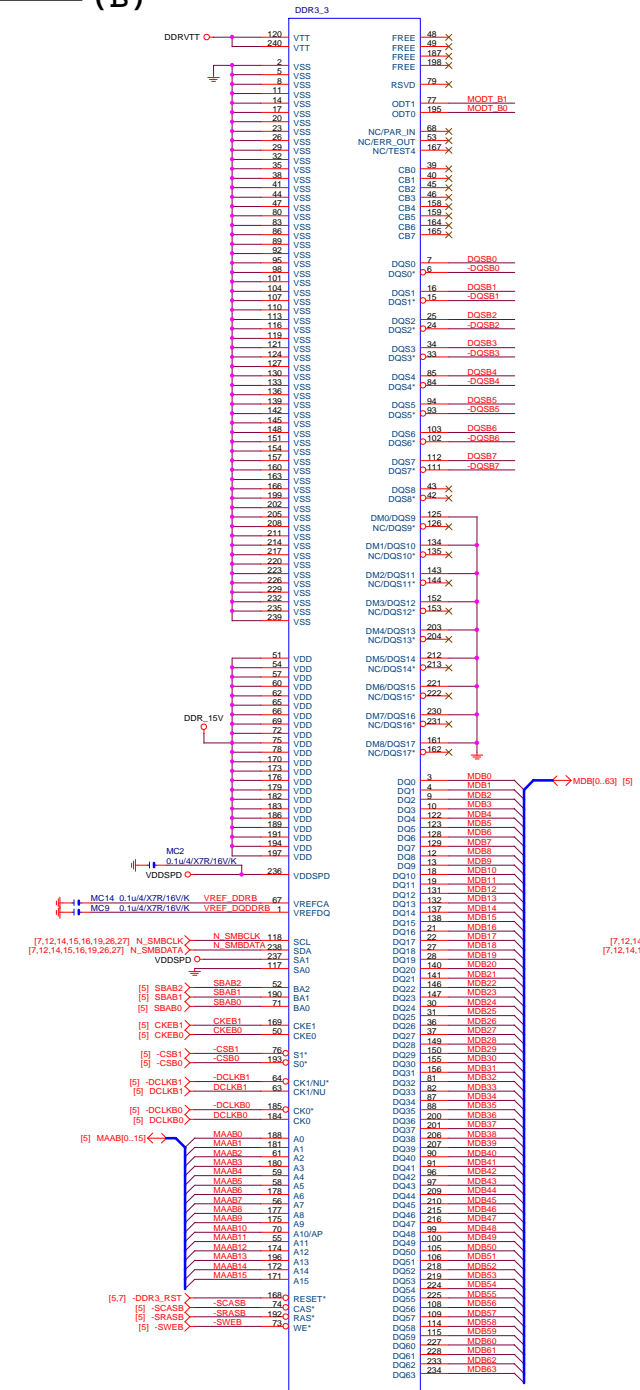
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Title			
CPU LGA1150-C			
Size	Document Number	GA-H87M-D3H	Rev
Custom			1.11
Date:	Thursday, August 15, 2013	Sheet	6 of 32

DDR3

(B)



PCH

(B)

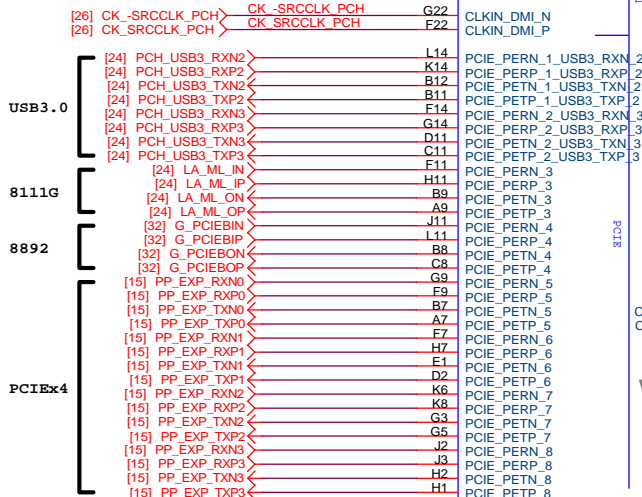
DMI:12/4/4/4/12(breakout min 8/4/4/4/8)
Impedance=85 +- 17.5%

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

B85: Port 6/7 N/A
H81: Port 6/7/12/13 N/A

W=4 mil out of PCH
S=15 mil out of PCH

VCC1_5_PCH



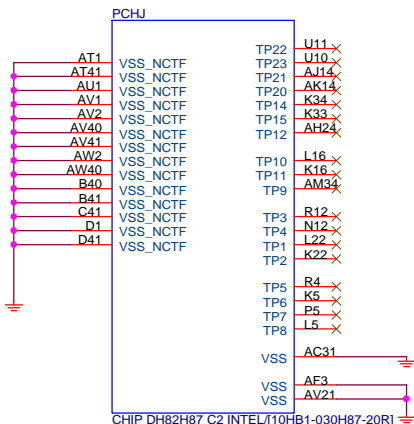
放靠近 Device & PCI-E Slot

Impedance=80 +- 17.5%

PCIE1:16/5/5/5/16 (breakout min 8/4/4/4/8)

PCH

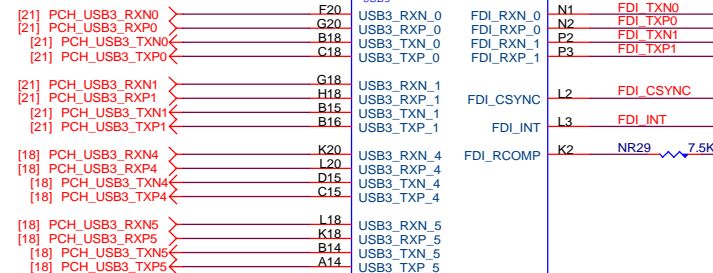
(J)



CHIP DH82H87 C2 INTEL(10HB1-030H87-20R)

PCH

(F)



VCC3

PCHF

USB3

FDILINK

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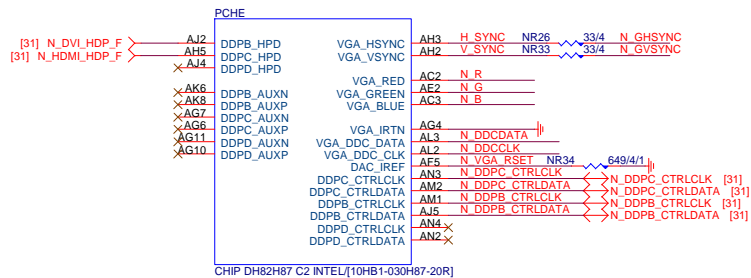
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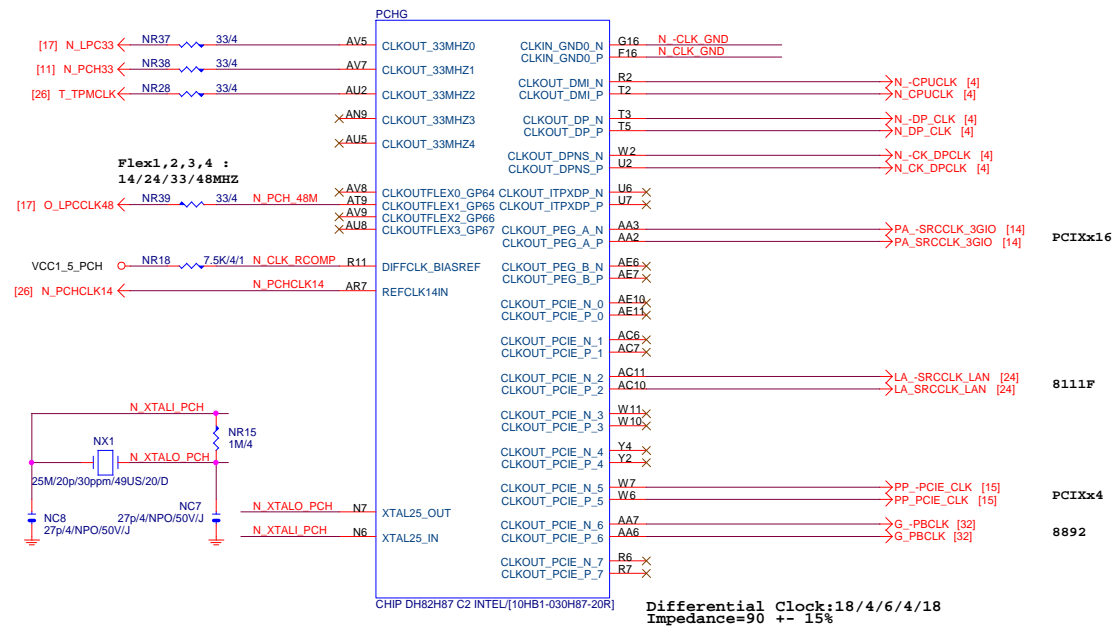
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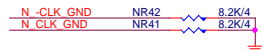
PCH (E)



PCH (G)



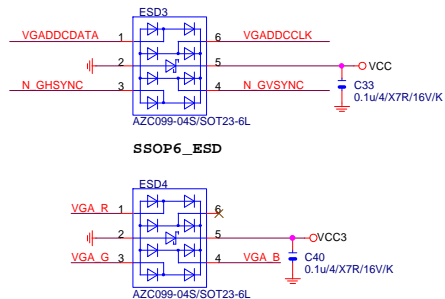
PCH CLK PD



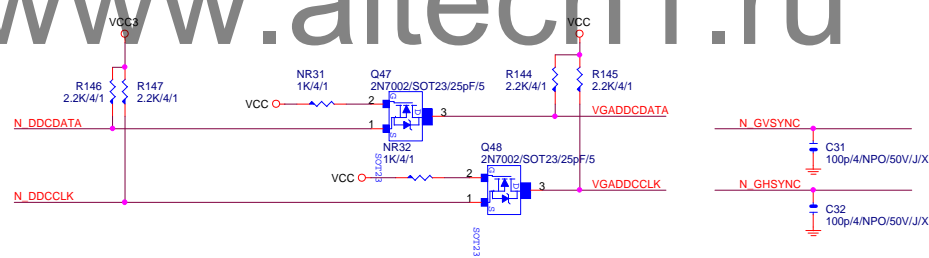
Mount for integrated clock Generation
Mode



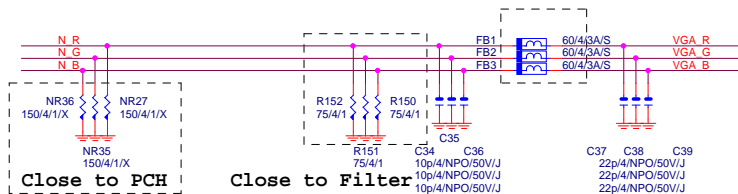
VGA ESD



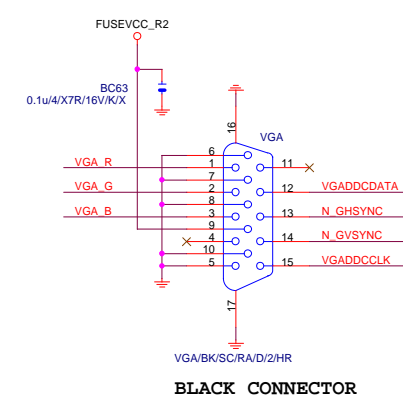
VGA DDC



VGA DDC



VGA CONNECTOR



Gigabyte Technology

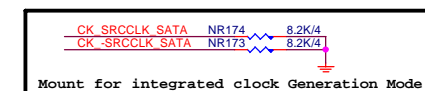
PCH DISPLAY ,CLK BUFFER

GA-H87M-D3H

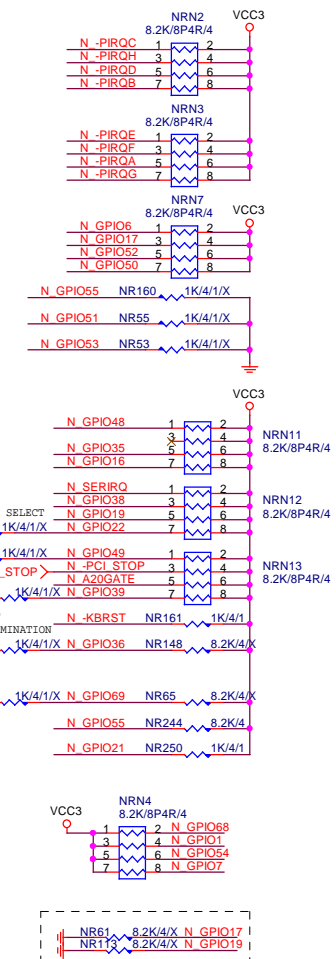
Size Custom	Document Number GA-H87M-D3H	Rev 1.11
Date: Thursday, August 15, 2013	Sheet 10 of 32	

Date: Thursday, August 15, 2013 Sheet 10 of 32

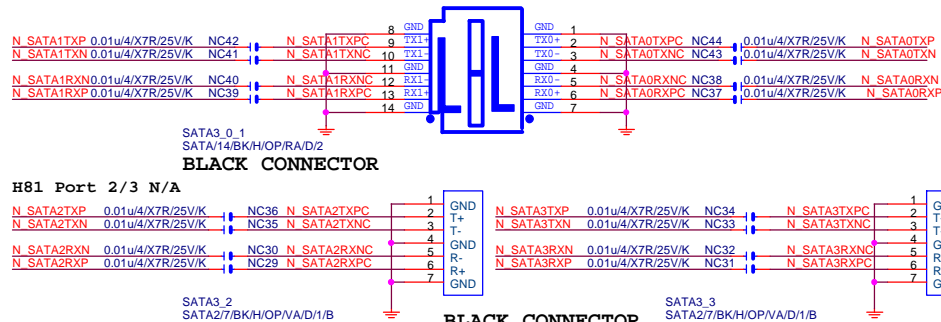
SATA3 : 20/7.5/4.5/7.5/20 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%
SATA2 : 15/7.5/4.5/7.5/15 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%



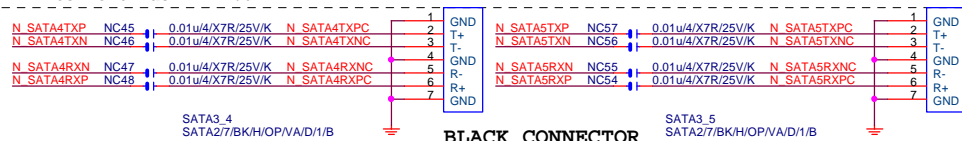
PCH	PU/PD
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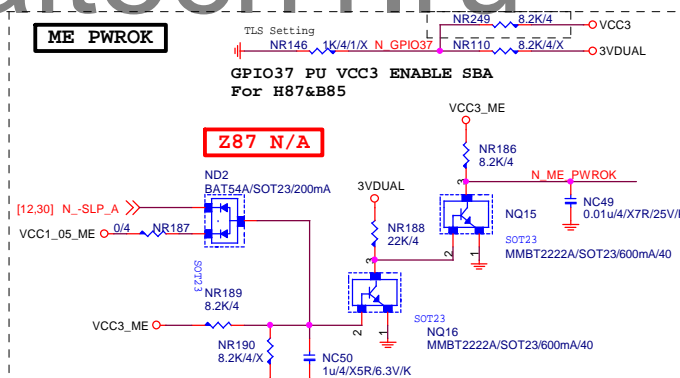
SATA CONNECTOR



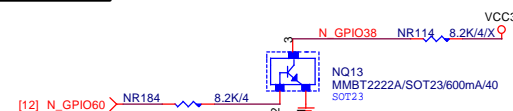
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** Z87/H87 Port 4&5 SATA3.0
** B85 Port 4&5 SATA2.0
```



ME PWROK



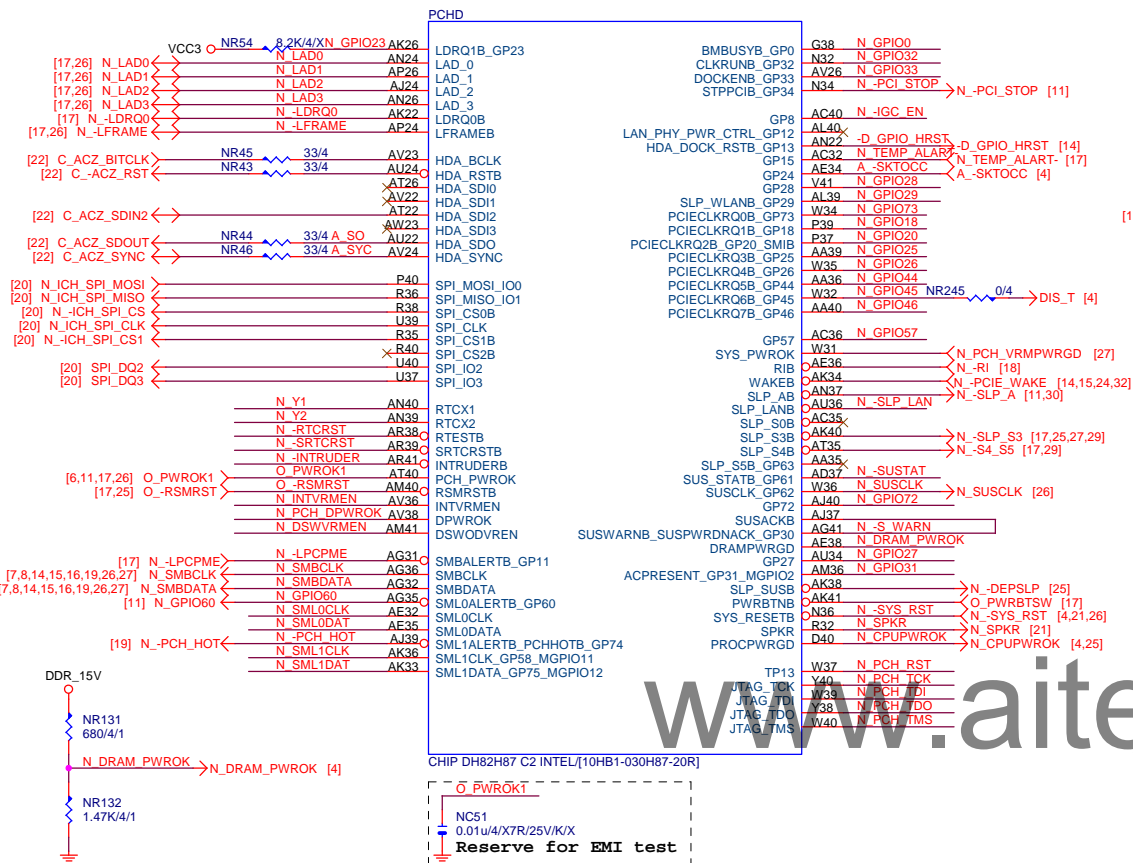
GPIO38 Ctrl



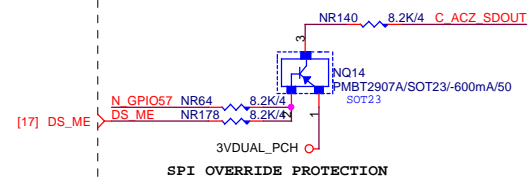
Gigabyte Technology

Title			
PCH HOST , SATA, PCI			
Size	Document Number		Rev
Custom	GA-H87M-D3H		1.1
Date:	Thursday, August 15, 2013	Sheet	11 of 32

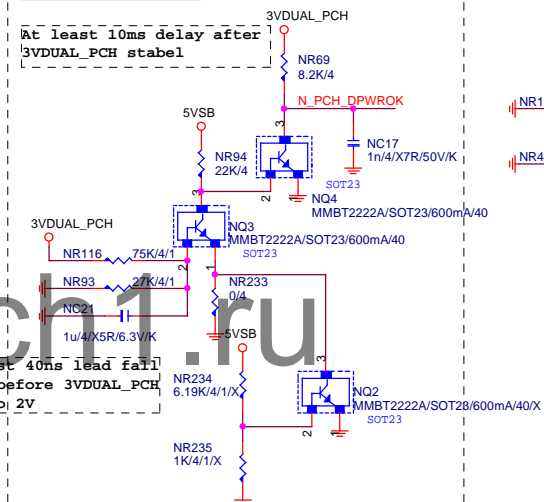
(D)



ACZ_SDOUT



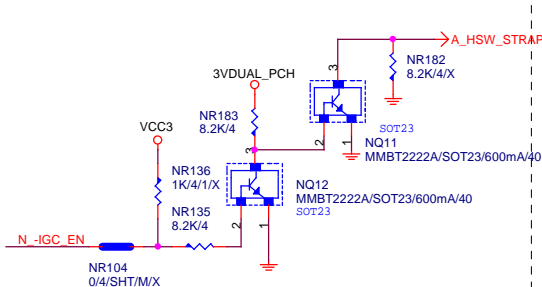
PCH_DPWROK



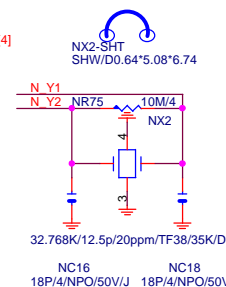
PCH	PU/PD
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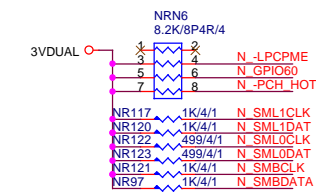
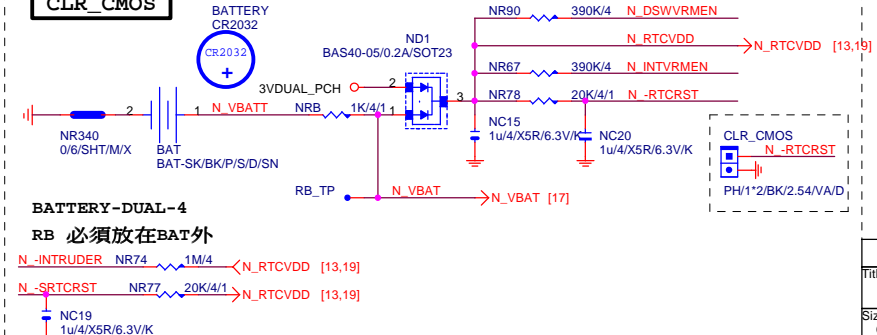
HSW_STRAP13



32.768KHZ



CLR_CMOS

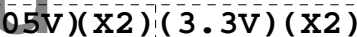
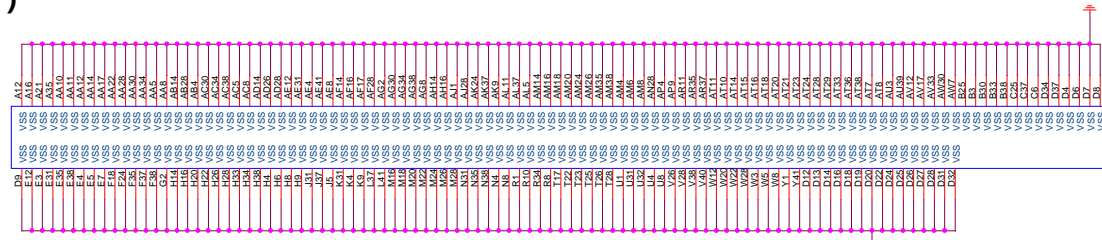


Gigabyte Technology

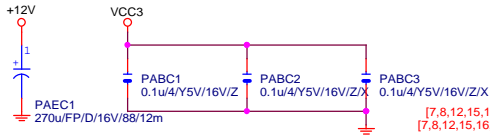
PCH GPIO , CTRL , AUDIO

Title			
PCH GPIO , CTRL , AUDIO			
Size	Document Number	GA-H87M-D3H	Rev
Custom			1.1
Date:	Thursday, August 15, 2013	Sheet	12 of 32

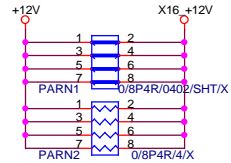
PCH (I)



PCIEX16 CAP



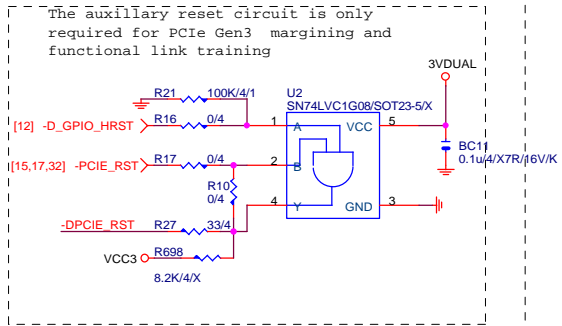
PCIEX16 PROTECT SHT



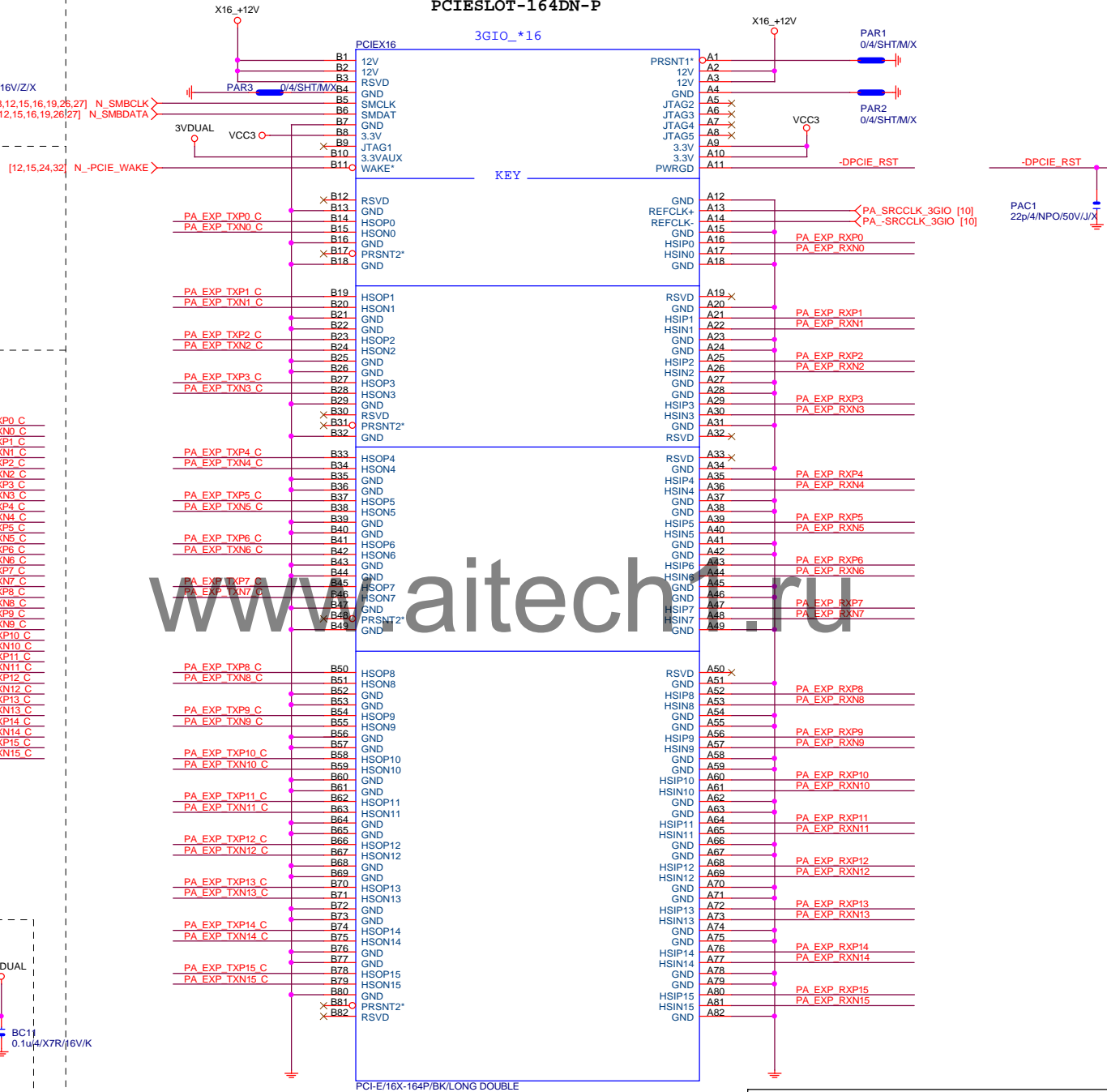
PCIEX16 AC CAP

PA EXP TXP0	PAC5	0.22u/4/X5R/6.3V/K	PA EXP TXP0 C
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_RXP0[0..15] [4]
PA_EXP_RXN0[0..15] >>> PA_EXP_RXN0[0..15] [4]
PA_EXP_TXP0[0..15] >>> PA_EXP_TXP0[0..15] [4]
PA_EXP_TXN0[0..15] >>> PA_EXP_TXN0[0..15] [4]



PCIEX16 SLOT



BLACK CONNECTOR

Gigabyte Technology

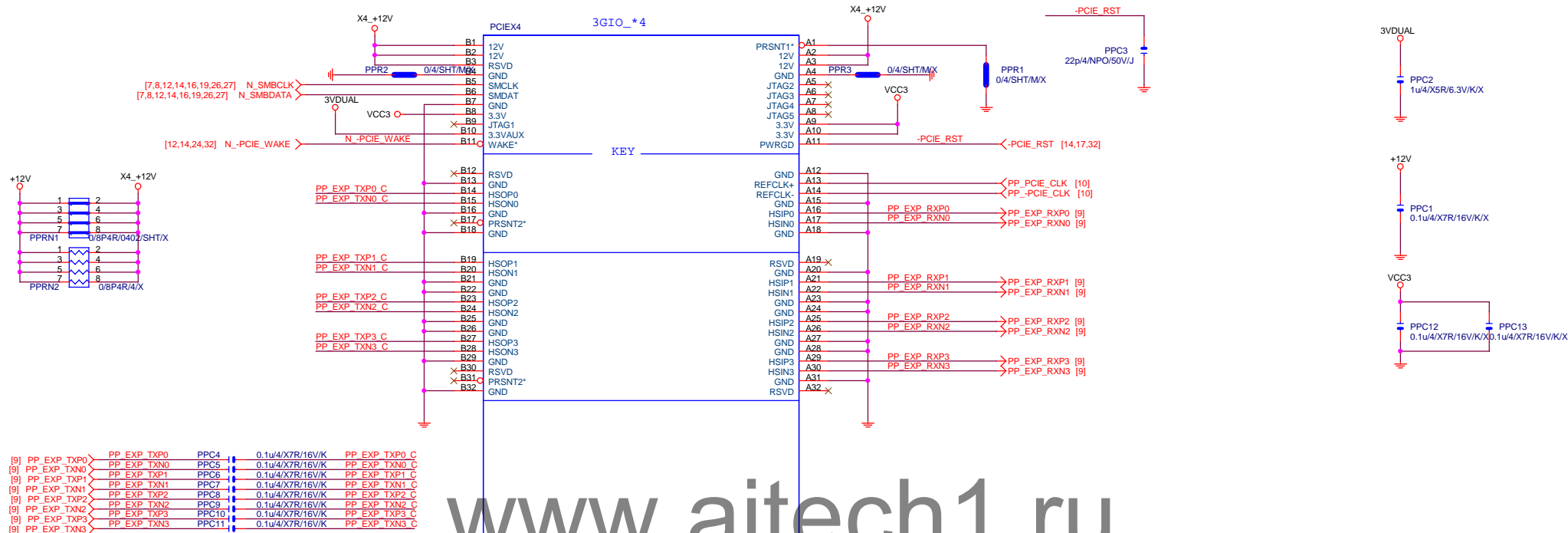
PCI EXPRESS * 16

Title

Size Custom Document Number GA-H87M-D3H Rev 1.11

Date: Thursday, August 15, 2013 Sheet 14 of 32

PCIEX4 SLOT



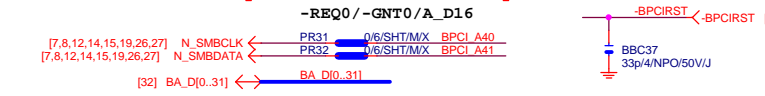
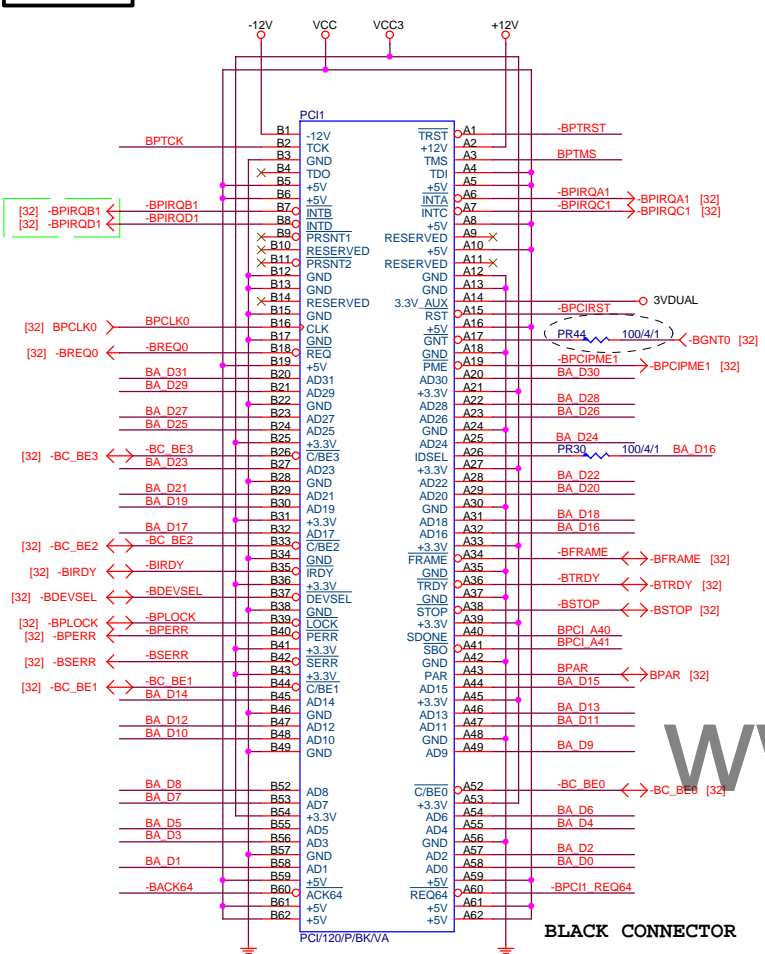
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PCI-E/4X-65P/BK/LONG DOUBLE

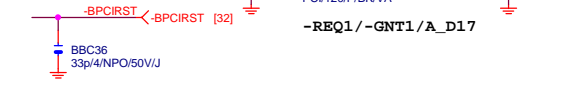
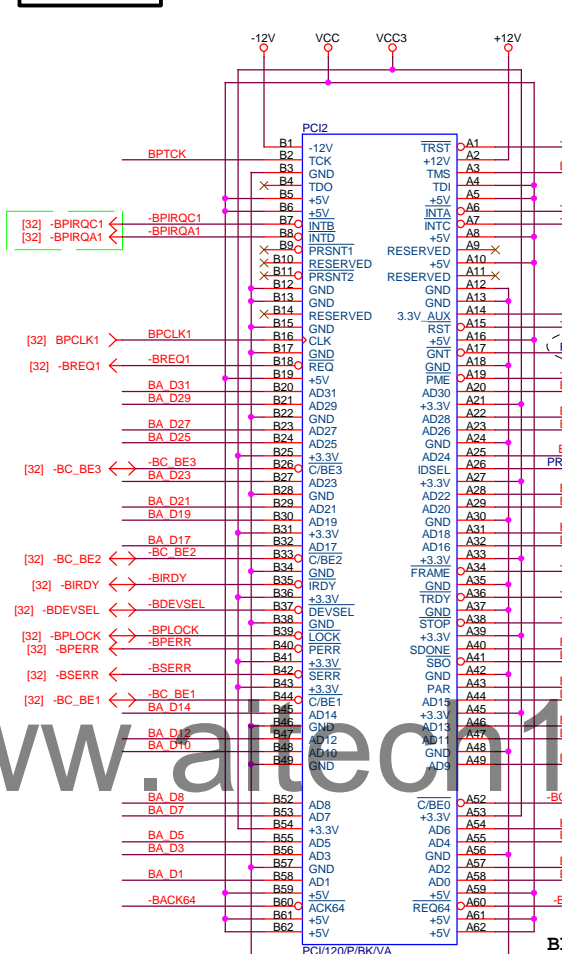
BLACK CONNECTOR

Gigabyte Technology			
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PCI EXPRESS X 1 PORT			
Size	Document Number	Rev	
Custom	GA-H87M-D3H	1.11	
Date:	Thursday, August 15, 2013	Sheet	15 of 32
2		1	

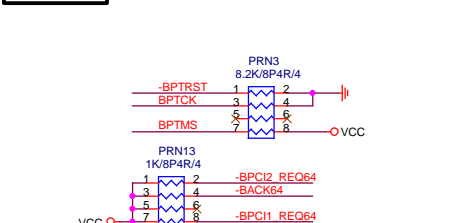
PCI SLOT 1



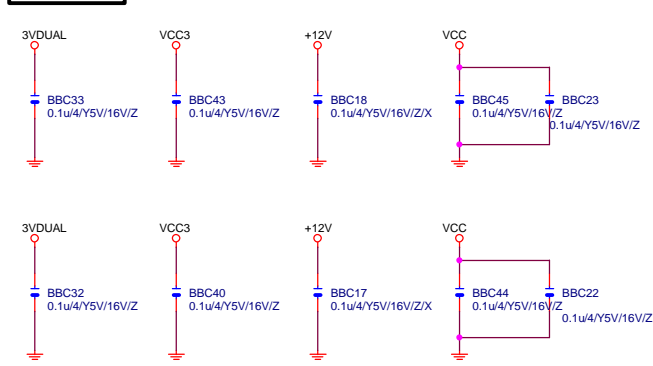
PCI SLOT 2



PCI PU

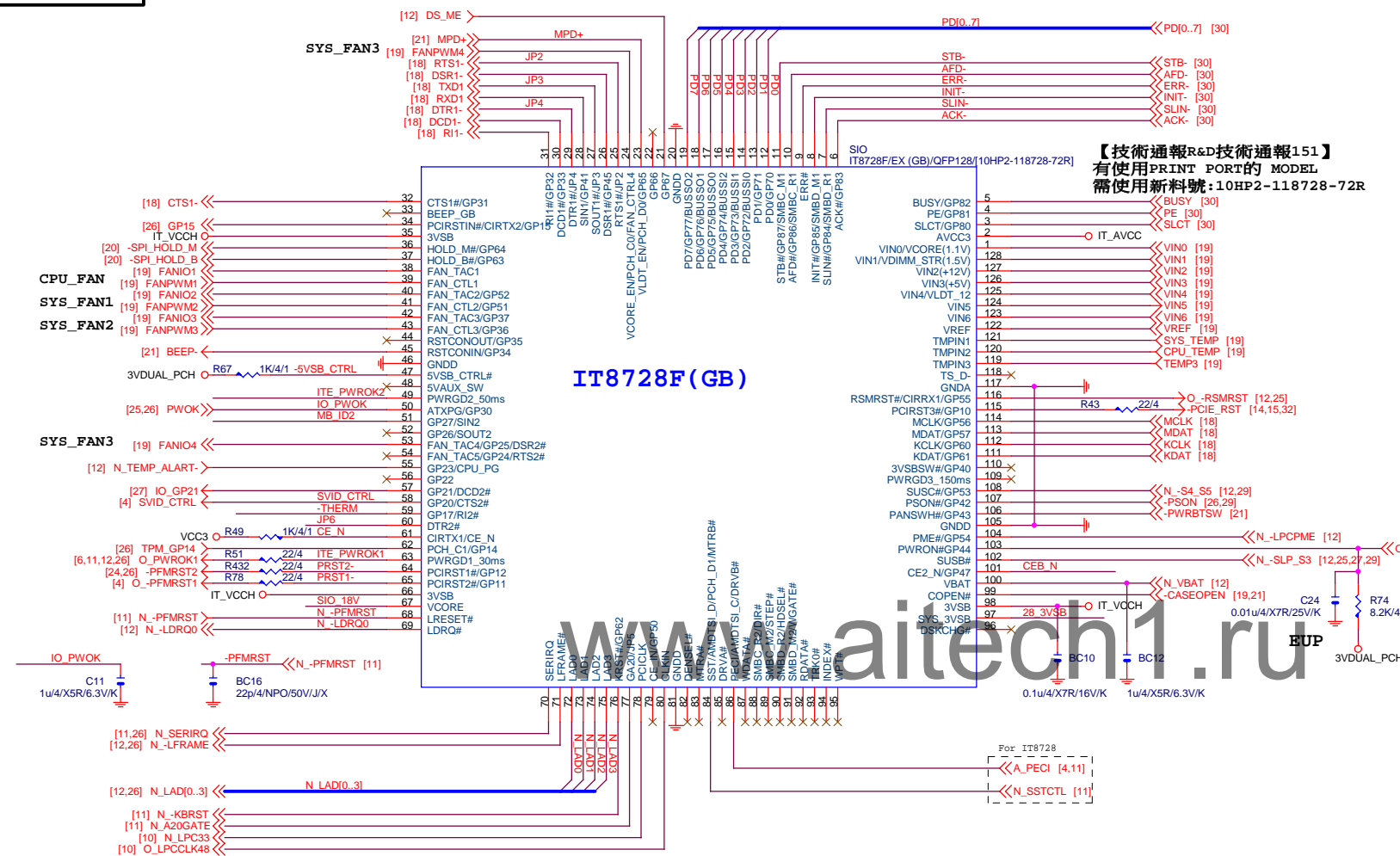


PCI CAP

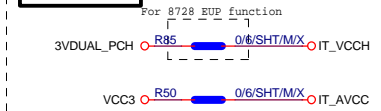


Gigabyte Technology			
Title			
PCI SLOT 1&2			
Size			
Custom			
Document Number			
GA-H87M-D3H			
Date:			
Thursday, August 15, 2013			
Sheet			
16 of 32			
Rev			
1.11			

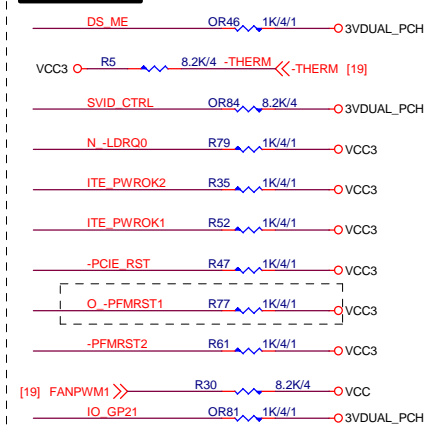
SIO IT8728F



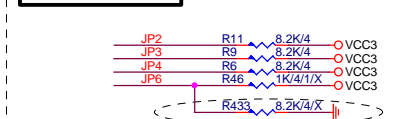
PWR	SHT
-----	-----



SIO	PU
-----	----



SIO STRAP



IT8728-EX
PULL DOWN

— —ENABLE

GVP con

3VDLIAI 100/4/1 R83 28_3VSB

OVERALL  

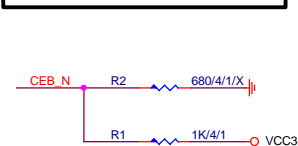
Journal of Management Inquiry 18(6) 709–724
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<http://www.sagepub.com/journalsPermissions.nav>

JP3--- High SPI-Flash Disable
Low SPI-Flash Enable

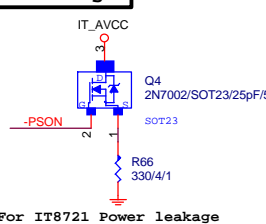
IT8728F NOTE

	IT8728
PIN121	VCORE_EN/PCF_C0
PIN120	VLED_EN/PCF_D0
PIN19	ATKPG
PIN31	PCF_C1
PIN53	SST/AMDTSI_D_MTRB#/PCF_D1
PIN55	PECI/AMDTSI_C/DRV#
PIN66	SYS_3VSB
PIN70	GP47
PIN95	VIN2(VCC5)
PIN96	VIN1(VCC12)
PIN97	VIN1/VDIMM_STR(1.5V)
PIN98	VIN0/VCORE(1.1V)/NC

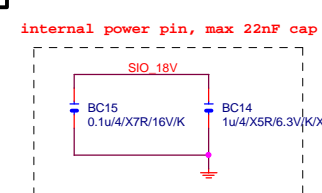
DUAL BIOS OPT STRAP



Power leakage

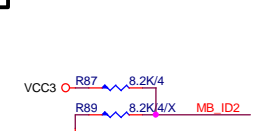


SIO_18V

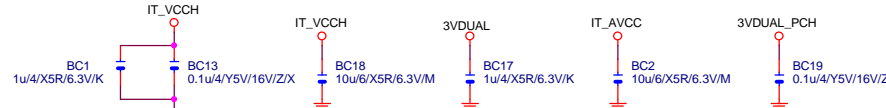


FOR LOW TEMP POWER ON INTO TEST MODE ISSUE

MB	ID
----	----



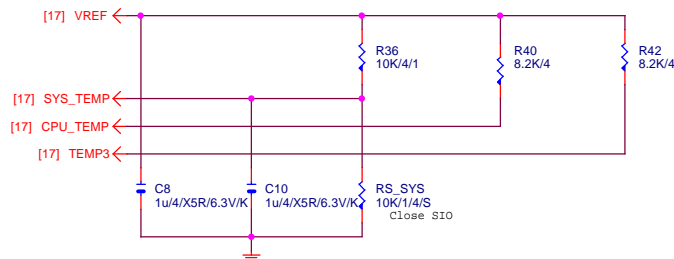
SIO CAP



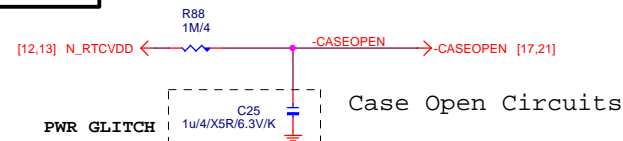
Gigabyte Technology

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ITE 8728 LPC IO			
Size	Document Number	Rev	
Custom	GA-H87M-D3H	1.11	
Date:	Thursday, August 15, 2013	Sheet	17 of 32

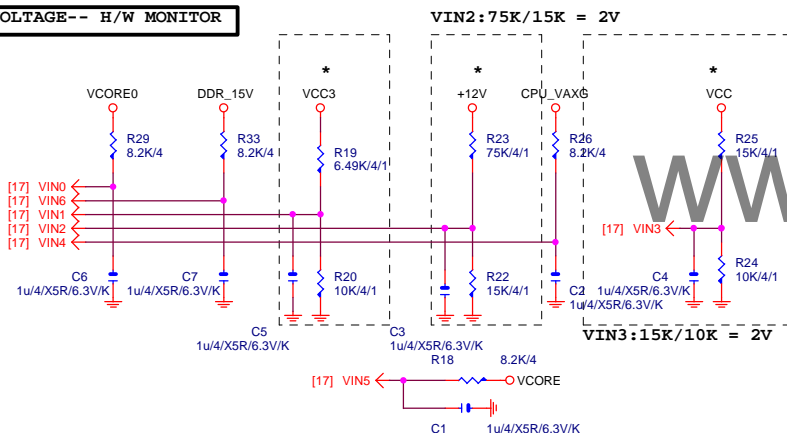
TEMP H/W MONITOR



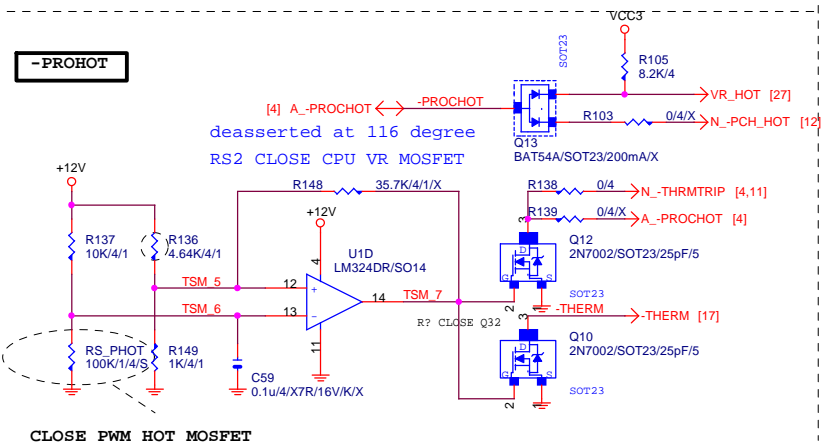
CASE OPEN



VOLTAGE-- H/W MONITOR

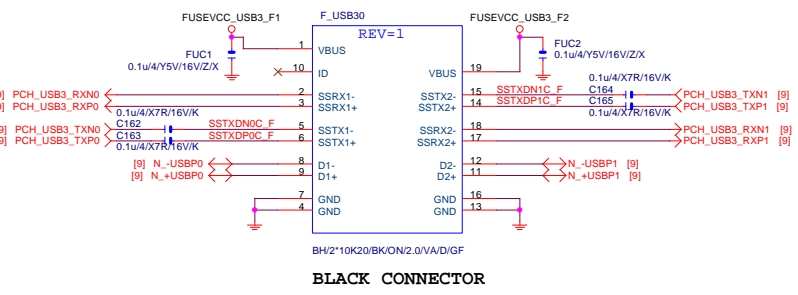


-PROHOT

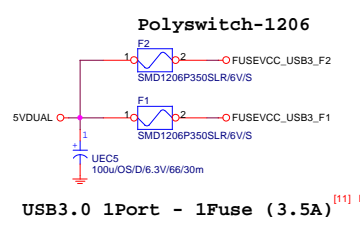


Date: Thursday, August 15, 2013 Sheet 20 of 32

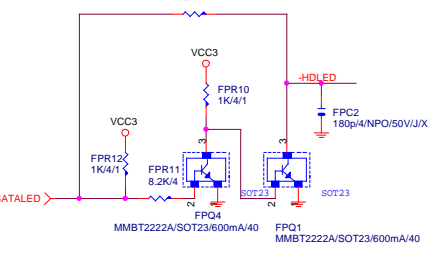
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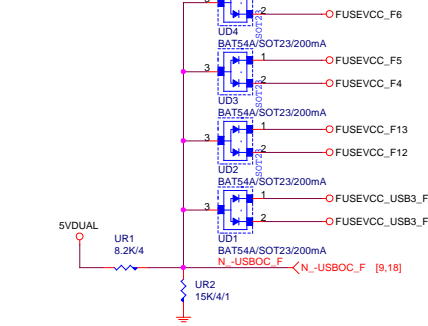
F_USB30 PWR



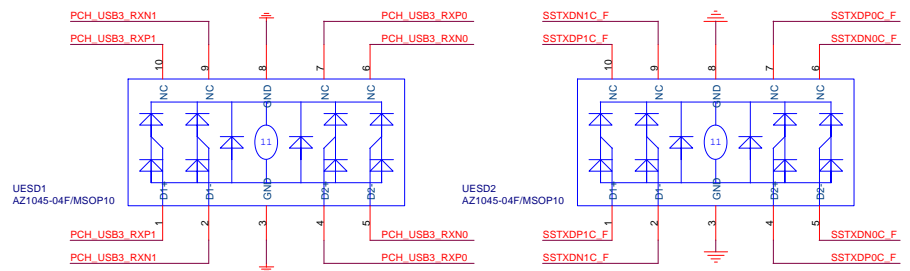
SATA LED



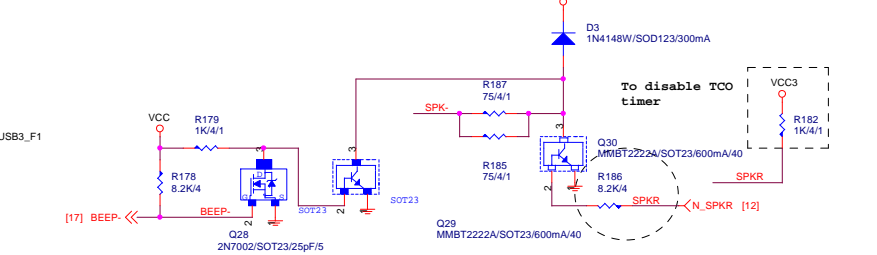
-USB0C_F



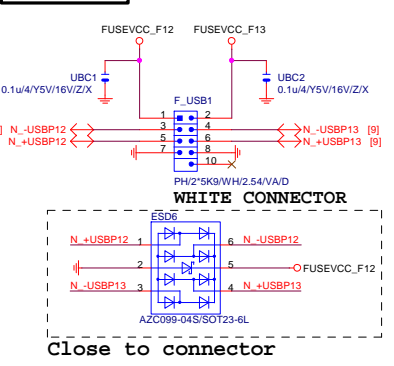
F_USB30 ESD PROTECT



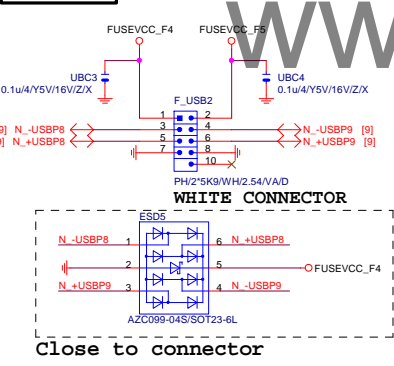
SPKR



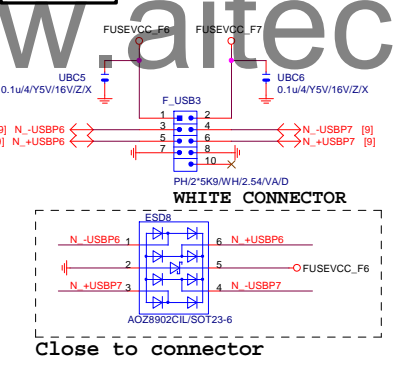
FRONT USB1



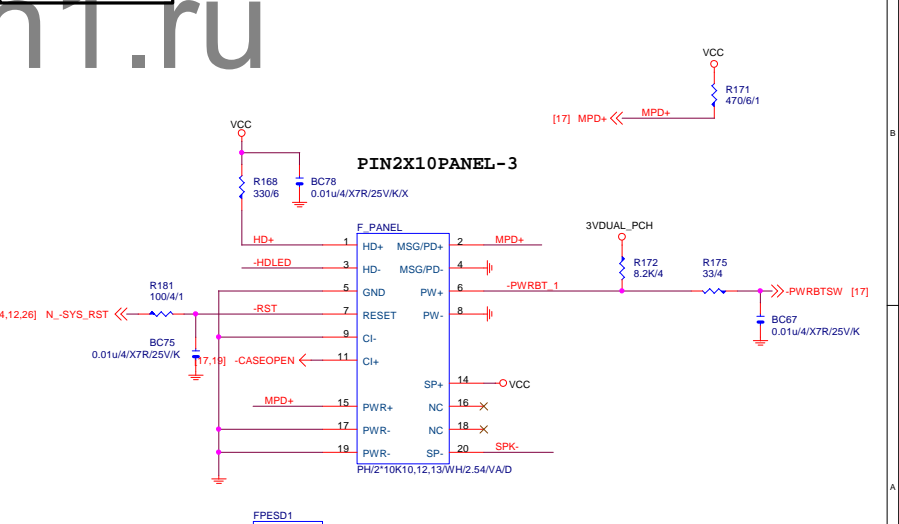
FRONT USB2



FRONT USB3



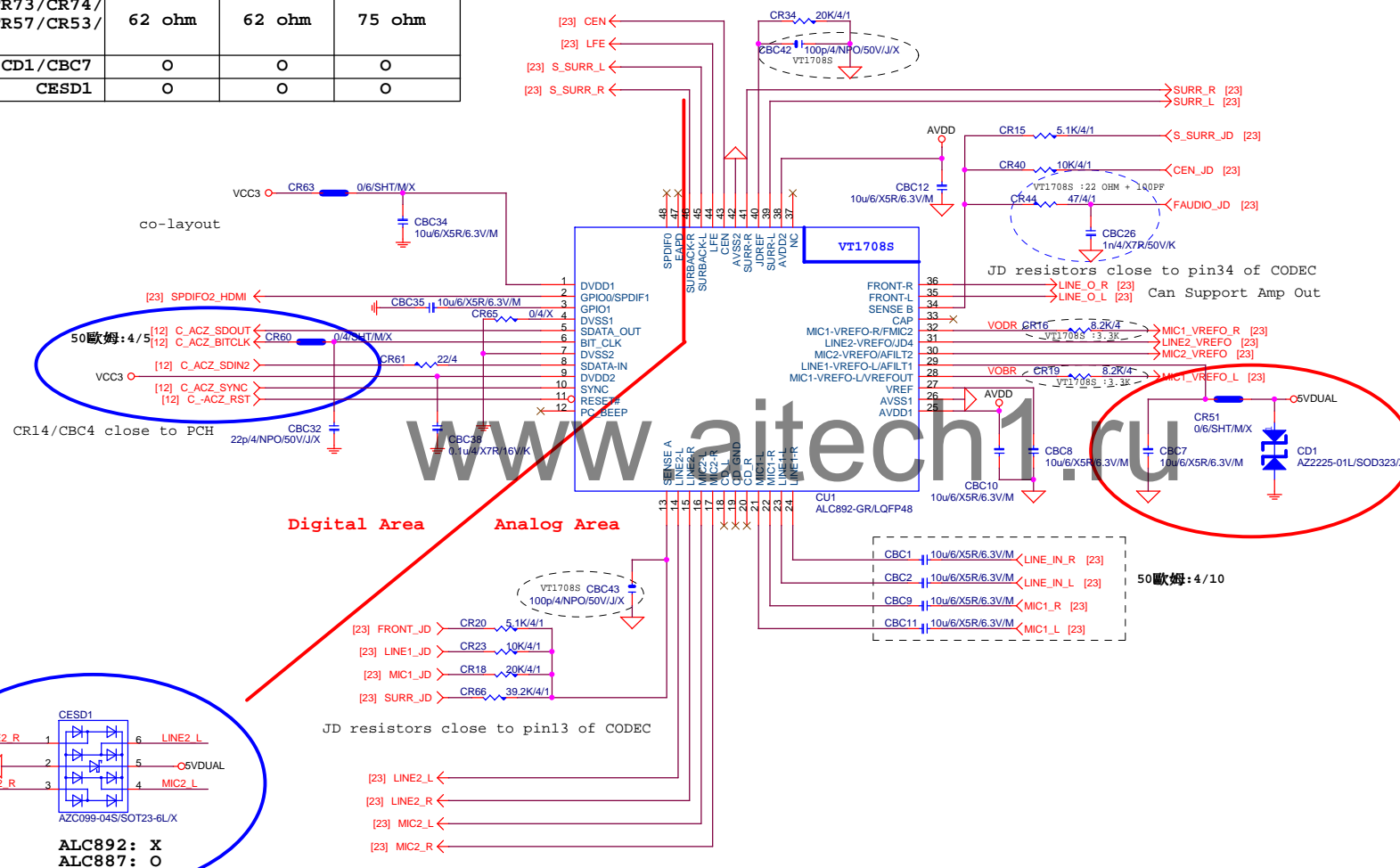
INTEL FRONT PANEL

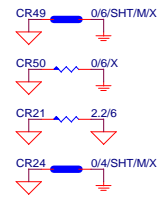


Gigabyte Technology			
FP,F_USB,USB PWR,SPKR,SATA LED			
GA-H87M-D3H			
Rev	1.11		

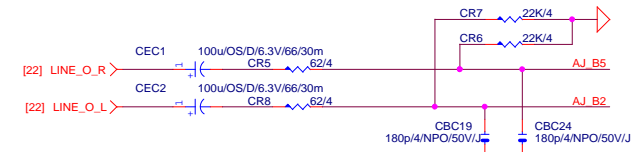
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	ALC892	ALC887-VD2	VT1708S-CE
CR44/CBC26	47ohm+1nF	47ohm+1nF	22ohm+100P
CBC42/CBC43	X	X	100P/4
CR6/CR7/CR58/CR54/ CR67/CR68/CR69/CR70	22K/4	22K/4	10K/4/1
CR5/CR8/CR1/CR14/ CR17/CR22/CR73/CR74/ CR13/CR11/CR57/CR53/ CR75/CR76	62 ohm	62 ohm	75 ohm
CR51/CD1/CBC7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



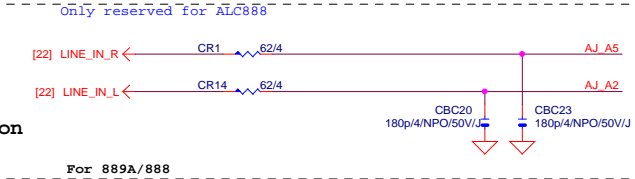


LINE-OUT

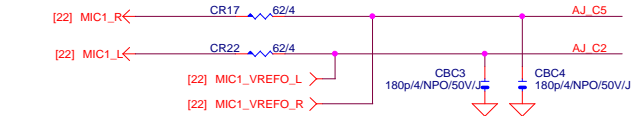


LINE-IN

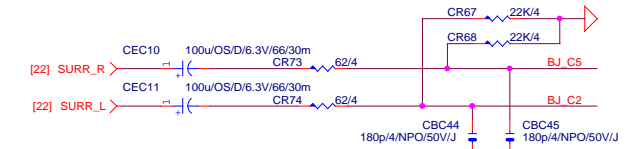
Verify MIC function
in LINE-in



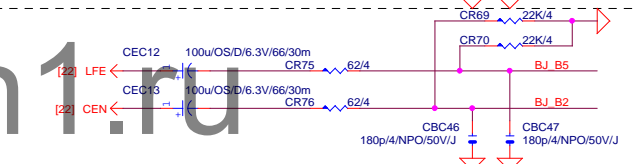
MIC-IN



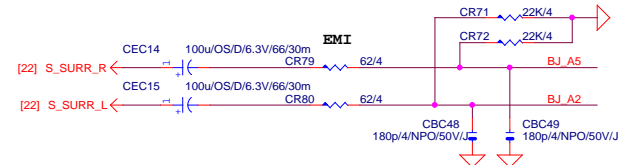
SURROUND



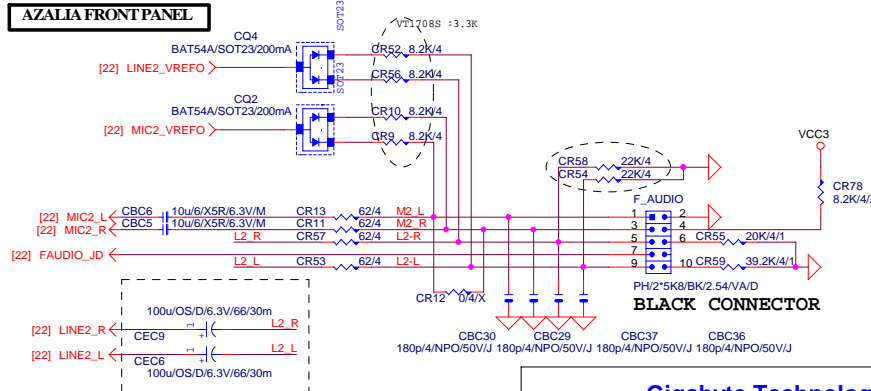
CEN/LFE



SURRBACK



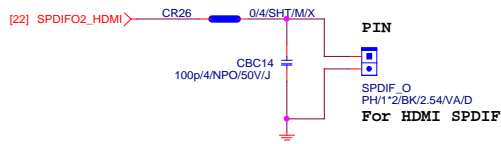
AZALIA FRONT PANEL



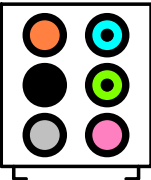
Gigabyte Technology

Title			
AUDIO JACK			
Size	Document Number	GA-H87M-D3H	
Custom			Rev 1.11
Date:	Thursday, August 15, 2013	Sheet	23 of 32

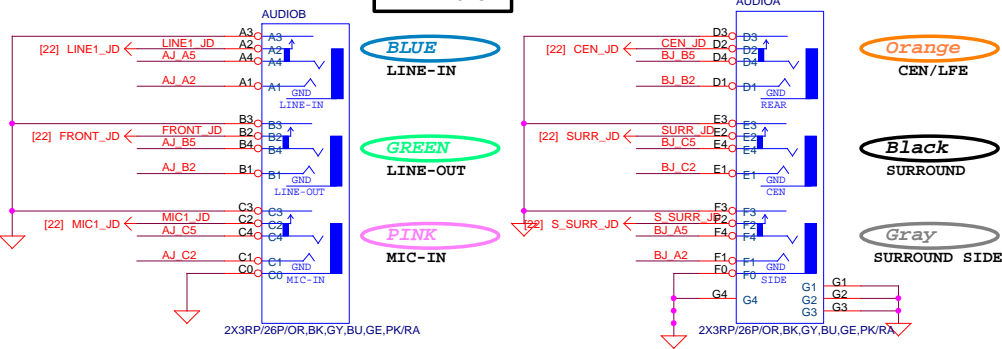
SPDIF_OUT



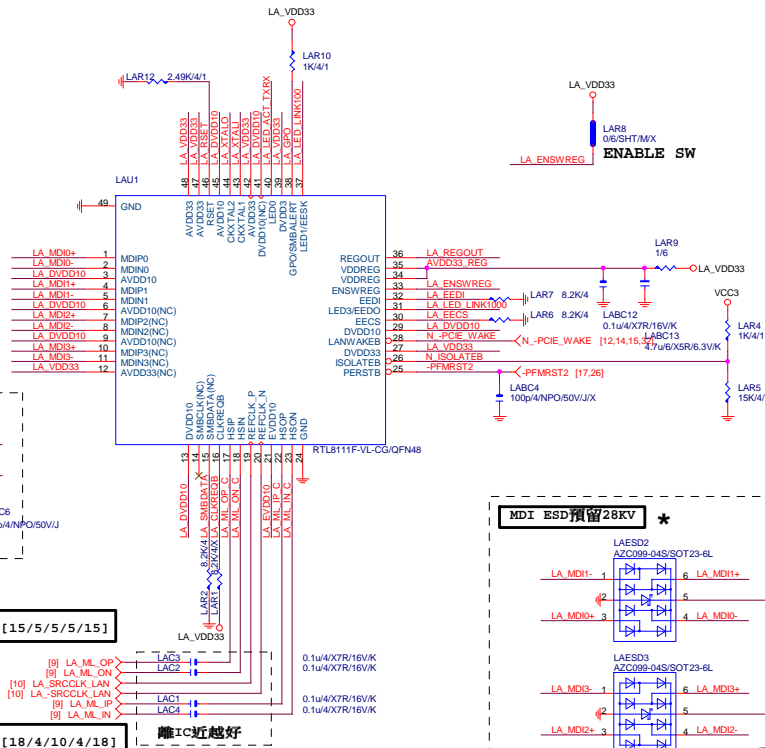
AZALIA JACK



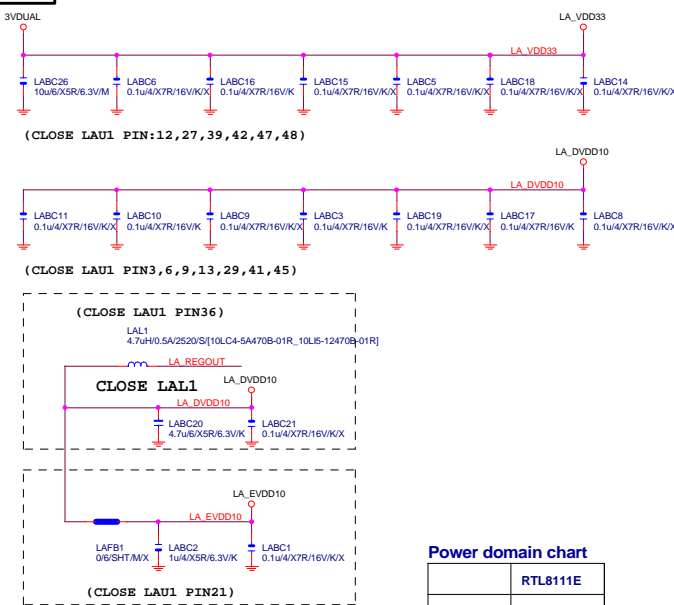
AZALIA JACK



LAN:RTL8111F/VB/VL



LAN POWER

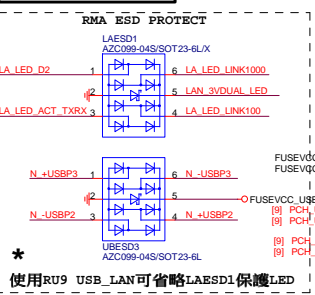


Power domain chart

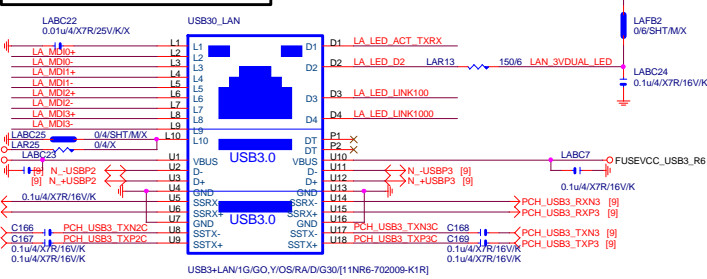
	RTL8111E
AVDD33	3.3V
DVDD33	3.3V
VDDREG	3.3V
DVDD10	1.05V

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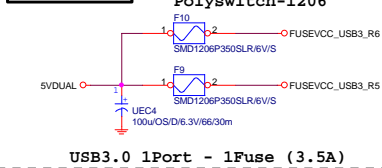
USB LAN CONNECTOR



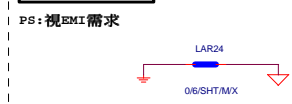
LA_MDI-->100歐姆:[20/4/8/4/20]



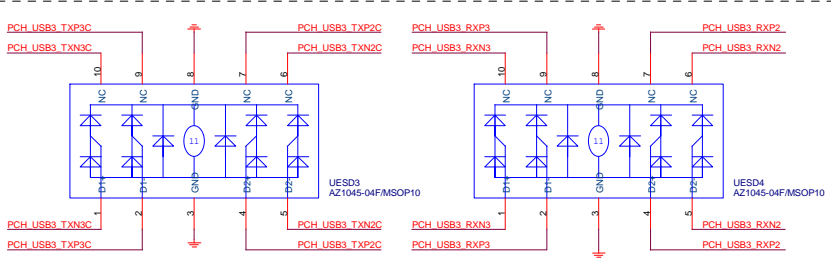
USB X3 POWER



EMI SHORT PAD



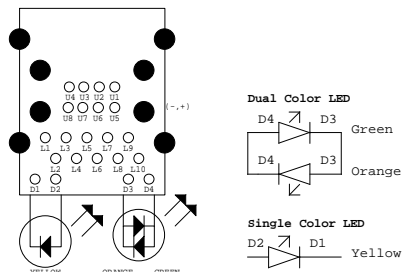
USB3.0 1Port - 1Fuse (3.5A)



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

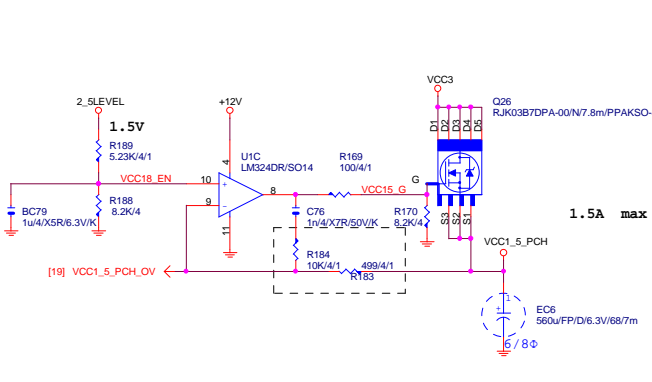
BOM NOTICE *

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:上件AZC398-04S		

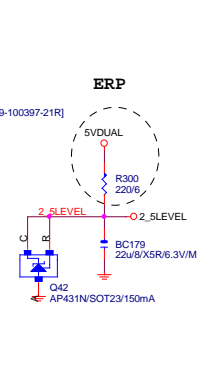


Gigabyte Technology		
Realtek RTL8111G		
Size	Document Number	Rev
Custom	GA-H87M-D3H	1.11
Date:	Thursday, August 15, 2013	Sheet 24 of 32

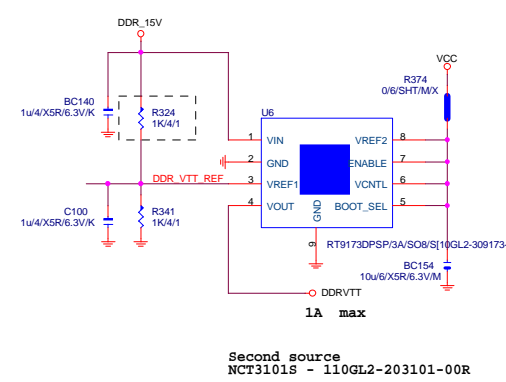
VCC1_8_PCH



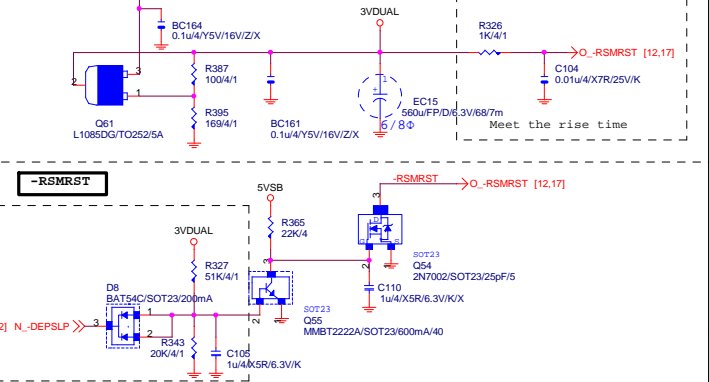
2_5LEVEL



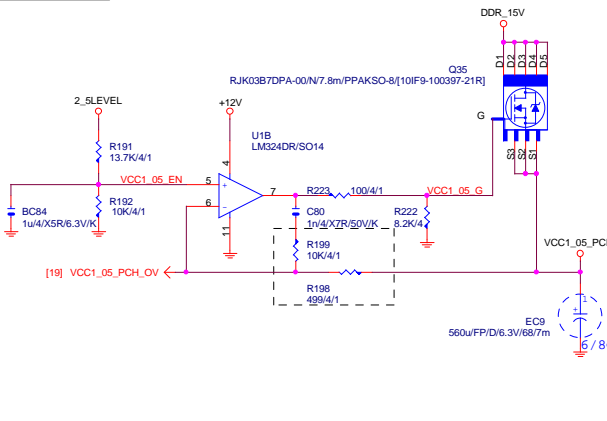
DDRVTT



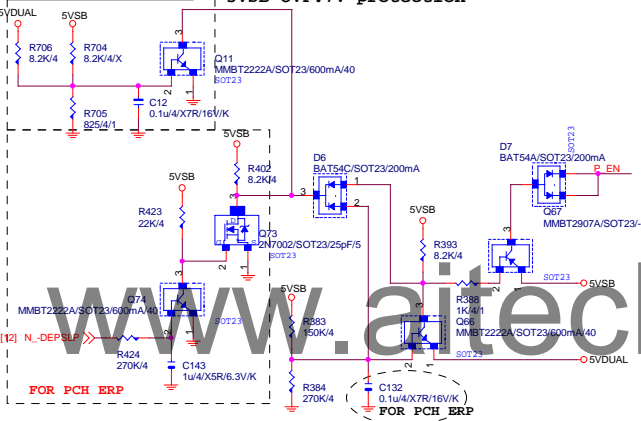
3VDUAL



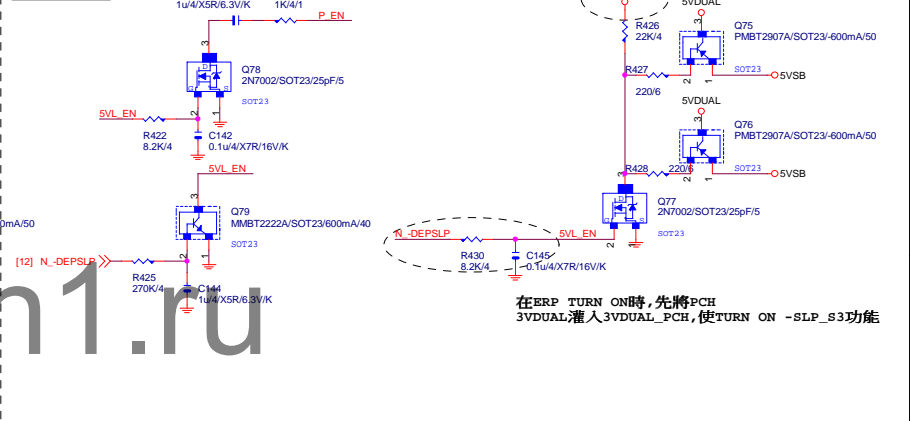
VCC1_05_PCH



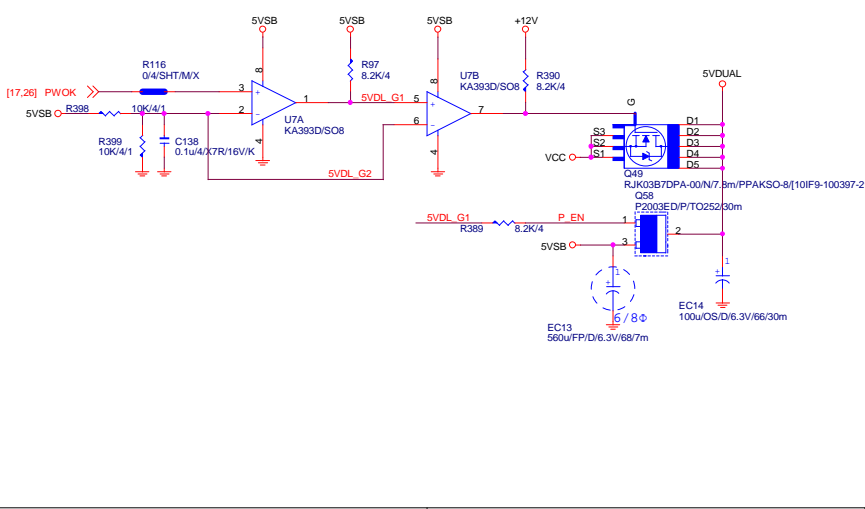
5VDUAL SHORT PROTECT



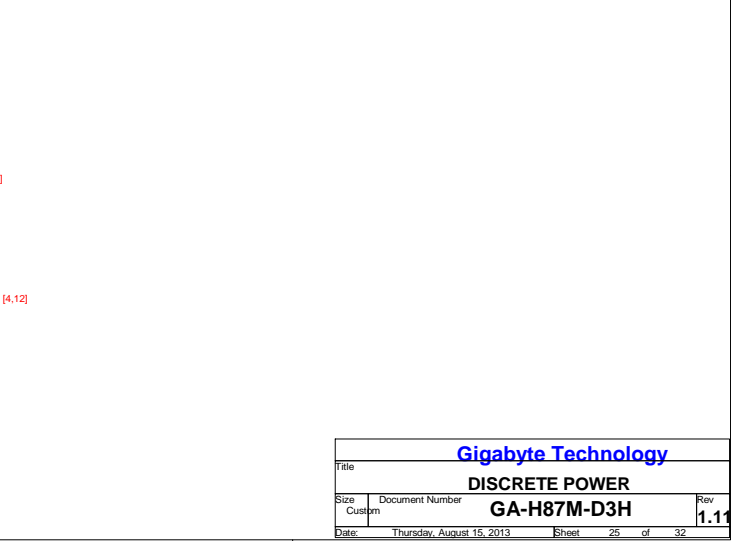
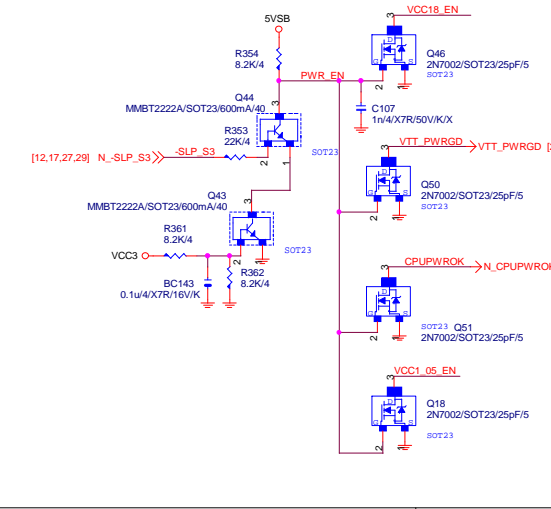
PCH ERP

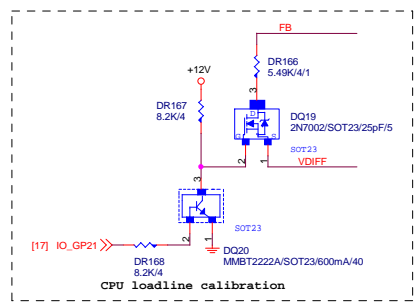
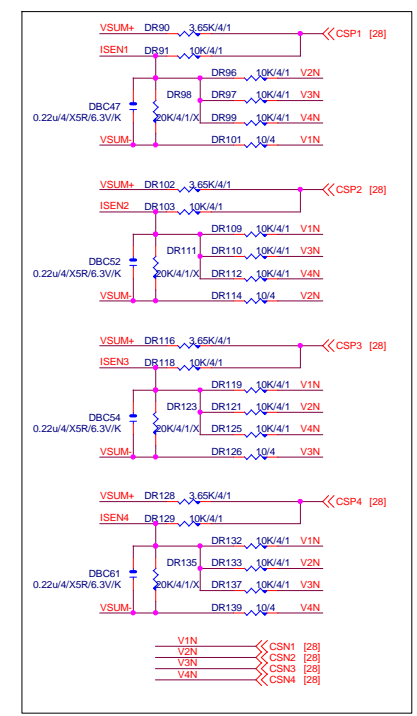
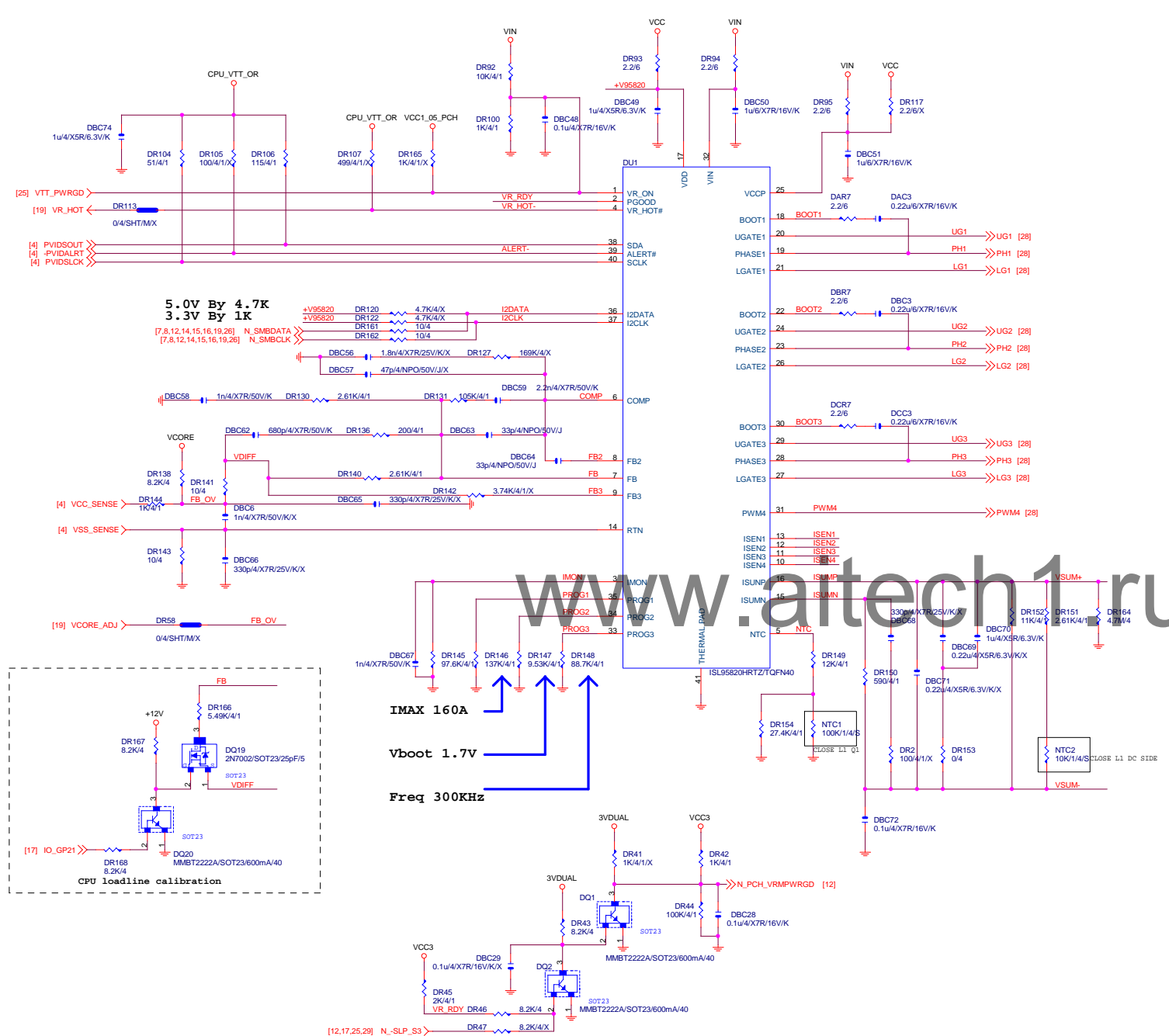


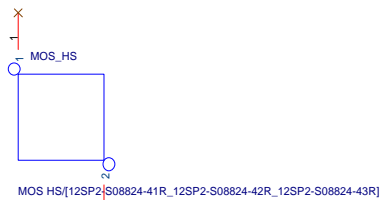
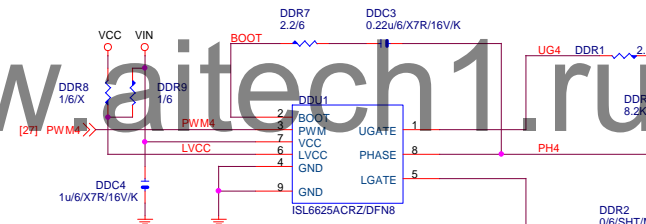
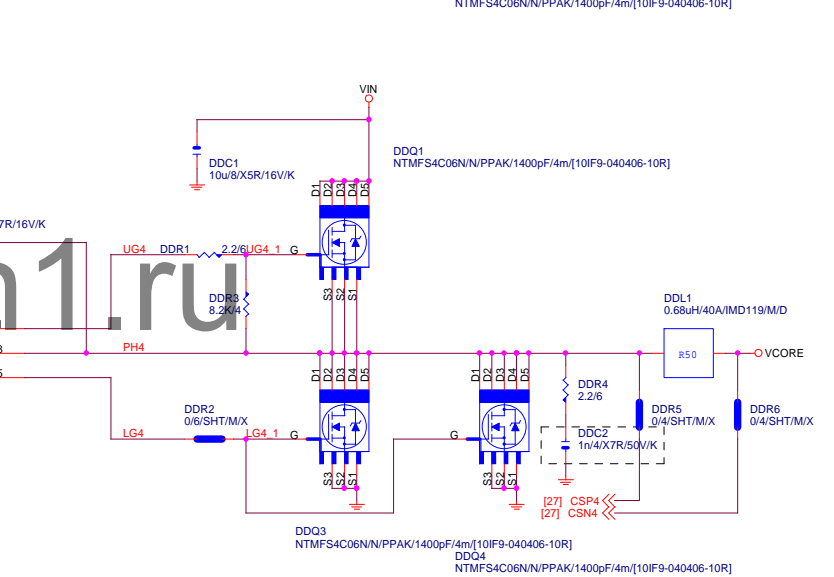
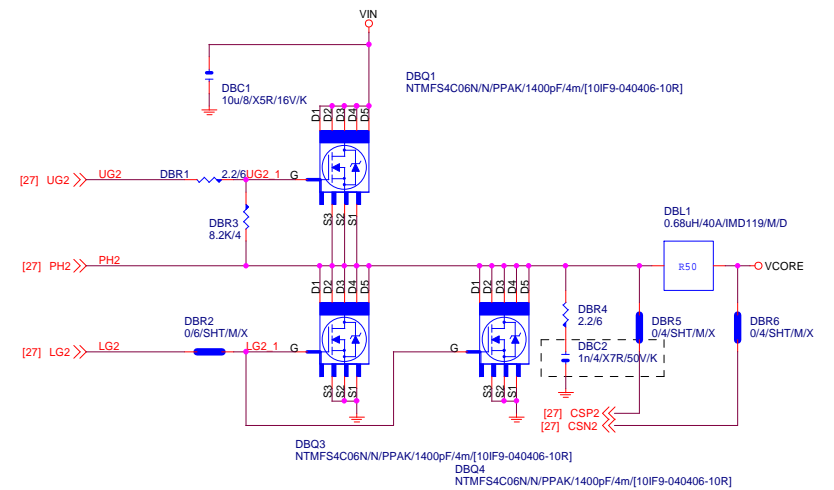
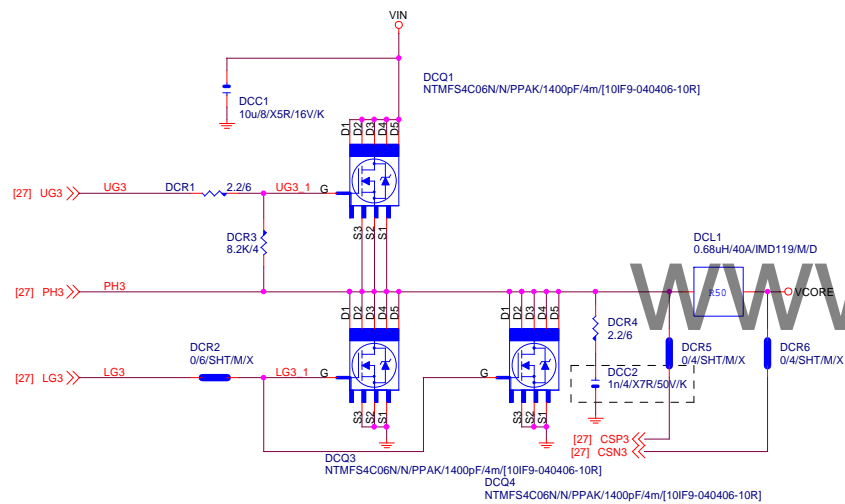
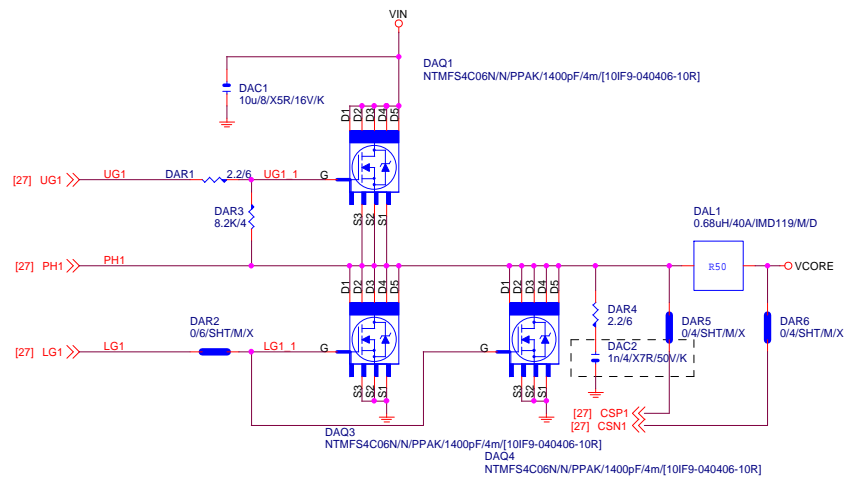
5VDUAL



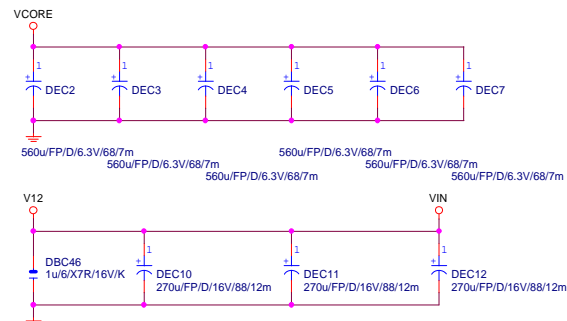
PWR SEQ





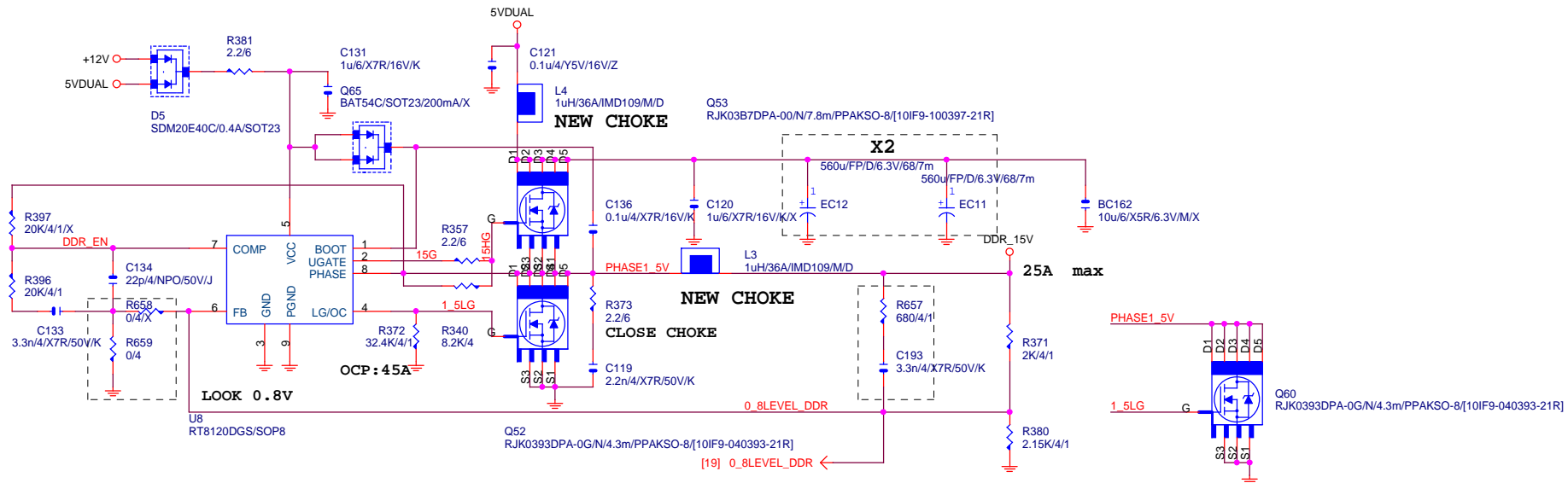


8 Series MOS Heatsink (Screw fix)

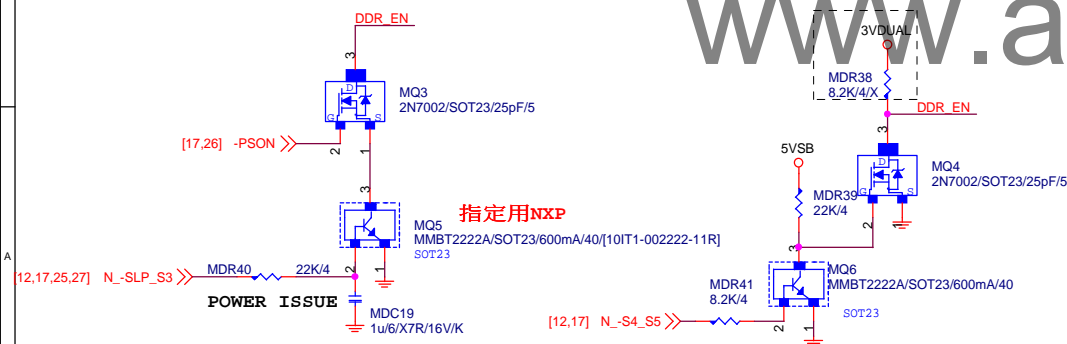


Gigabyte Technology			
Title			
CPU CORE VR-2			
Size			
Custom			
Document Number			
GA-H87M-D3H			
Date:			
Thursday, August 15, 2013			
Sheet			
28 of 32			
Rev			
1.11			

DDR1.5V



PWR_SEQ



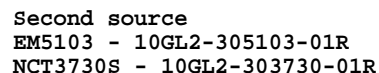
VIN=5V, VOUT=1.5V, IOU=25A, PHASE=1
 IRMS=11.45A
 560u/FP/D/6.3V/68/8m RIPPLE CURRENT=4.7A
 Coefficient=1.7(85°C), 1(105°C)
 VIN Ripple current=4.7X1.7=7.99A(85°C)
 -->故固態電容須2X7.99=15.98>11.45A

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

Gigabyte Technology

Title		
DDR POWER		
Size	Document Number	Rev
Custom	GA-H87M-D3H	1.11
Date:	Thursday, August 15, 2013	Sheet 29 of 32

【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

[illegible]

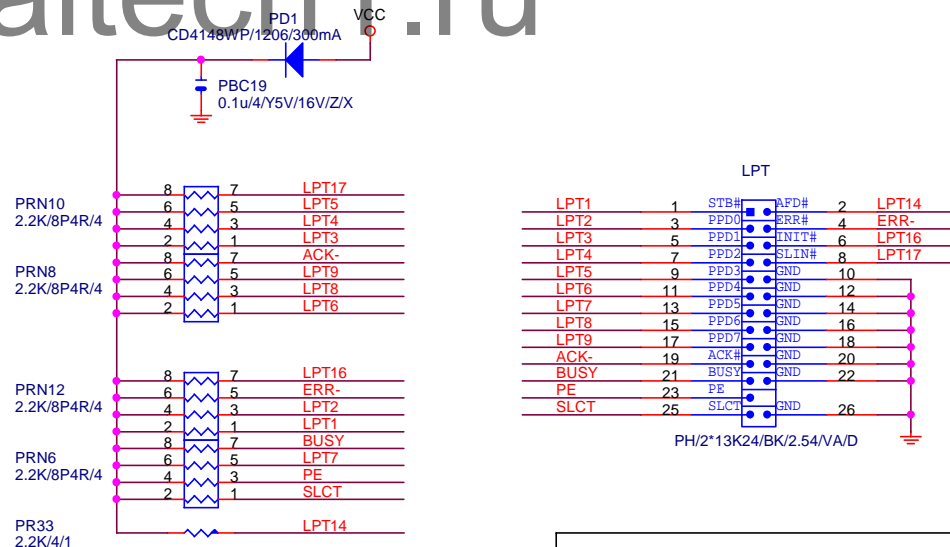
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Figure 10 shows the pin connections for three modules: PRN11, PRN9, and PRN7. Each module is a 68/8P4R/4 type. The connections are as follows:

- PRN11 (68/8P4R/4):**
 - Pin 1: STB- (connected to [17] STB-)
 - Pin 2: LPT1
 - Pin 3: PD0
 - Pin 4: LPT2
 - Pin 5: AFD- (connected to [17] AFD-)
 - Pin 6: LPT14
 - Pin 7: INIT- (connected to [17] INIT-)
 - Pin 8: LPT16
- PRN9 (68/8P4R/4):**
 - Pin 1: PD1
 - Pin 2: LPT3
 - Pin 3: PD2
 - Pin 4: LPT4
 - Pin 5: PD3
 - Pin 6: LPT5
 - Pin 7: SLIN- (connected to [17] SLIN-)
 - Pin 8: LPT17
- PRN7 (68/8P4R/4):**
 - Pin 1: ERR- (connected to [17] ERR-)
 - Pin 2: LPT6
 - Pin 3: ACK- (connected to [17] ACK-)
 - Pin 4: LPT8
 - Pin 5: BUSY (connected to [17] BUSY)
 - Pin 6: LPT9
 - Pin 7: PE (connected to [17] PE)
 - Pin 8: LPT17

Additional connections shown include [17] PD[0..7] connected to the bottom of the PRN7 module.

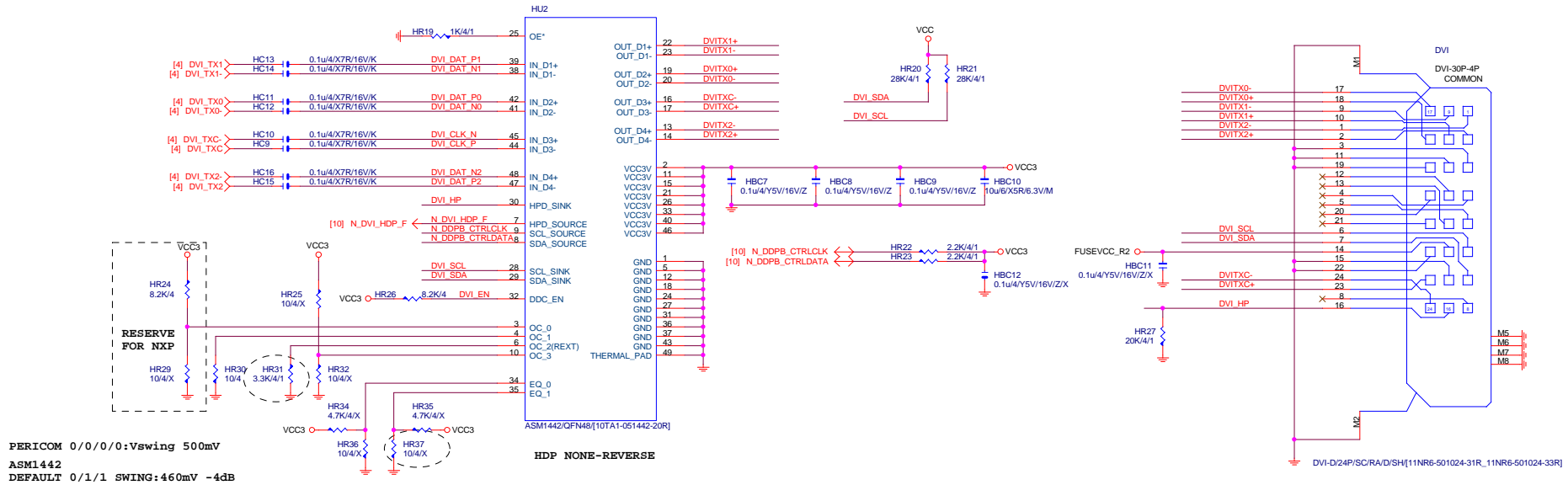
【技術通報R&D技術通報151】
33ohm Change to 68ohm



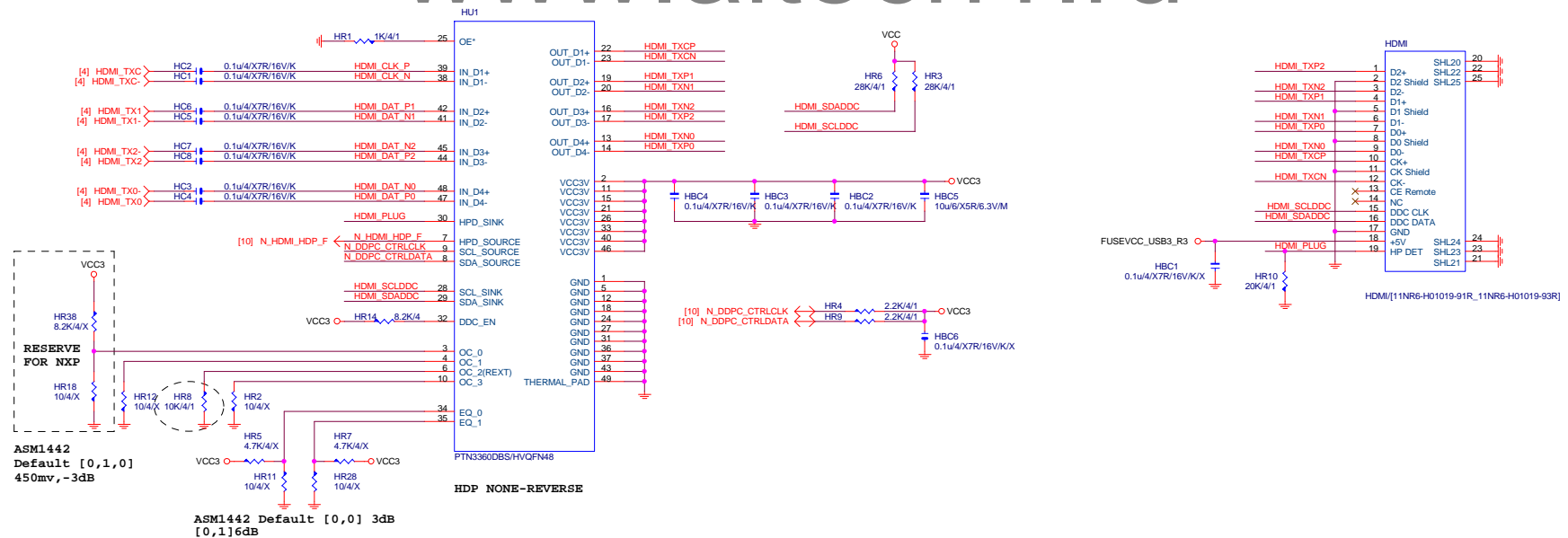
Gigabyte Technology

Title			
LPT			
Size Custom	Document Number		Rev
	GA-H87M-D3H		1.1
Date:	Thursday, August 15, 2013	Sheet	30 of 32

DVI LEVEL SHIFT



HDMI LEVEL SHIFT

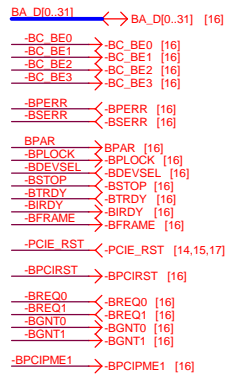


Gigabyte Technology

File			DVI
Size			Document Number
Custom			GA-H87M-D3H
Date			Thursday, August 15, 2013
Sheet			31 of 32
Rev			1.11

PCIE TO PCI

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

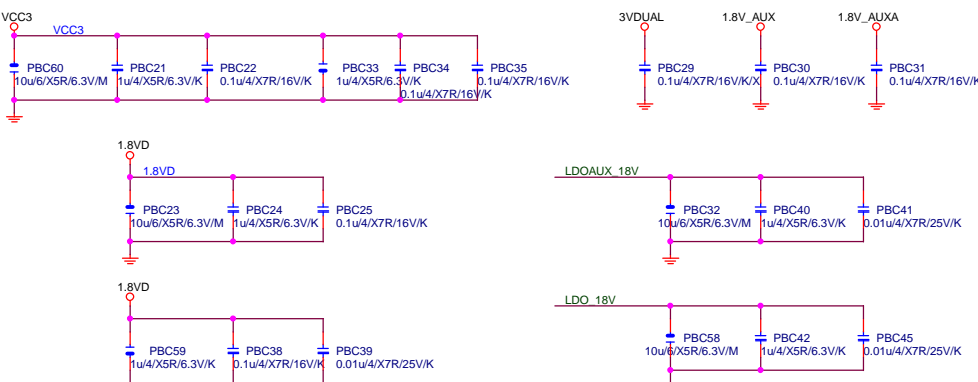
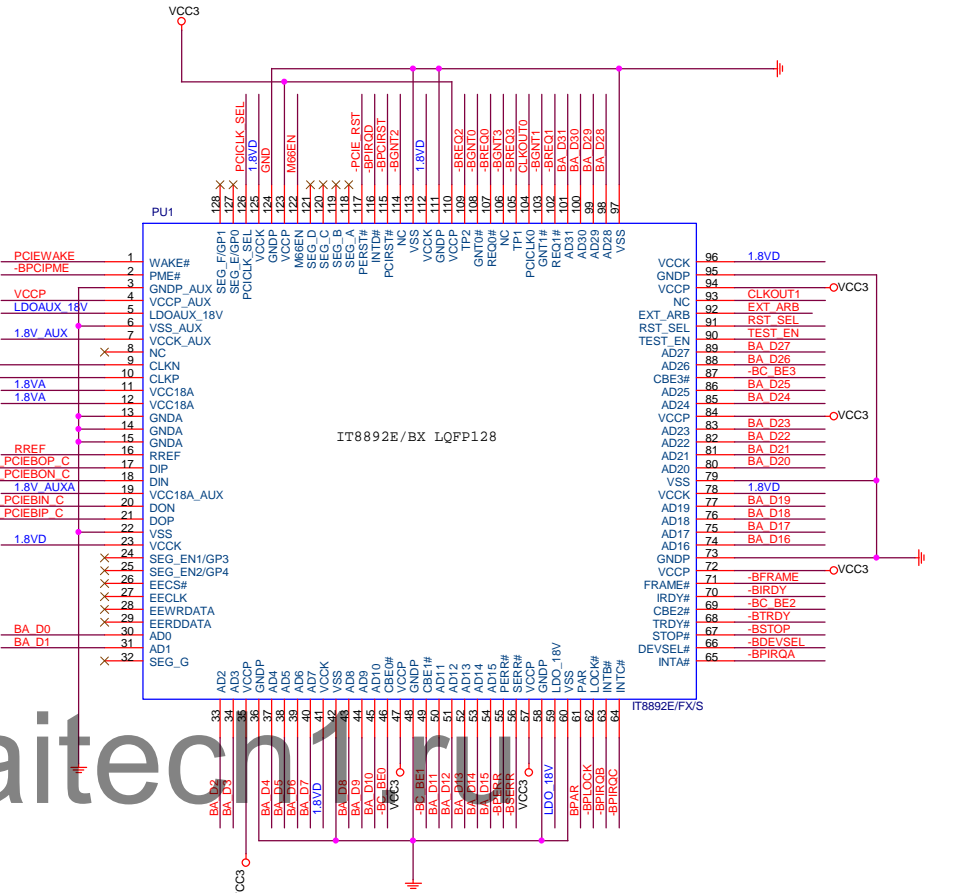
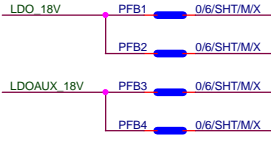
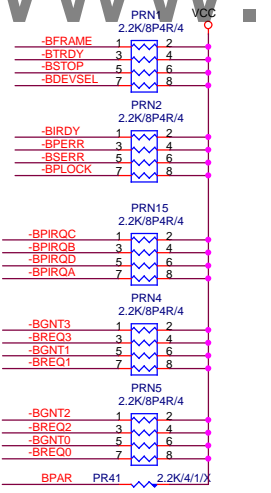
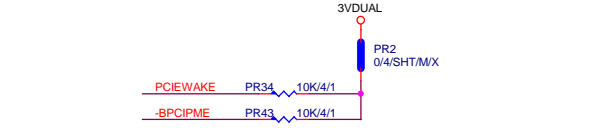
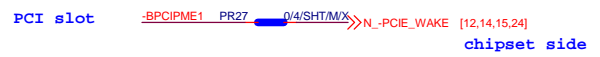
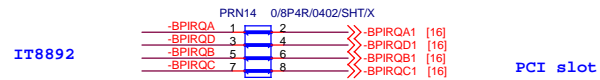
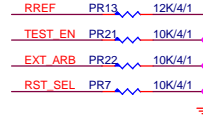
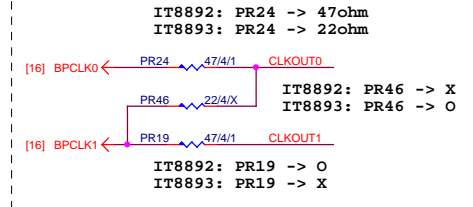


High: Enable PCI CLK 66MHz
Low: Disable PCI CLK 66MHz



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

Co-Lay IT8893 (IT8893 CLKOUT1 N/A)



PCB layout note:
Close to chip

PCB layout note:
Close to chip

Gigabyte Technology			
Title			
ITE IT8892E			
GA-H87M-D3H			
Size	Document Number	Rev	
Custom		1.11	
Date:	Thursday, August 15, 2013	Sheet	32 of 32