

Model Name: GA-H87N

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	ITE 8728 LPC IO
16	COM,KB_USB30
17	HWM,FAN CTRL,OV,-PROCHOT
18	DUAL BIOS
19	FP,FUSB,SPK,SATALED
20	Realtek ALC892
21	REAR AUDIO JACK
22	INTEL LAN I217 (A)
23	Artheros AR8161B (B)
24	DISCRETE POWER
25	ATX,CLK GEN
26	RT8120_DDR POWER,M3 POWER
27	VCORE ISL95820_1

SHEET

TITLE

28	VCORE ISL95820_2
29	DVI-I
30	HDMI * 2
31	mini PCI-E

www.aitech1.ru

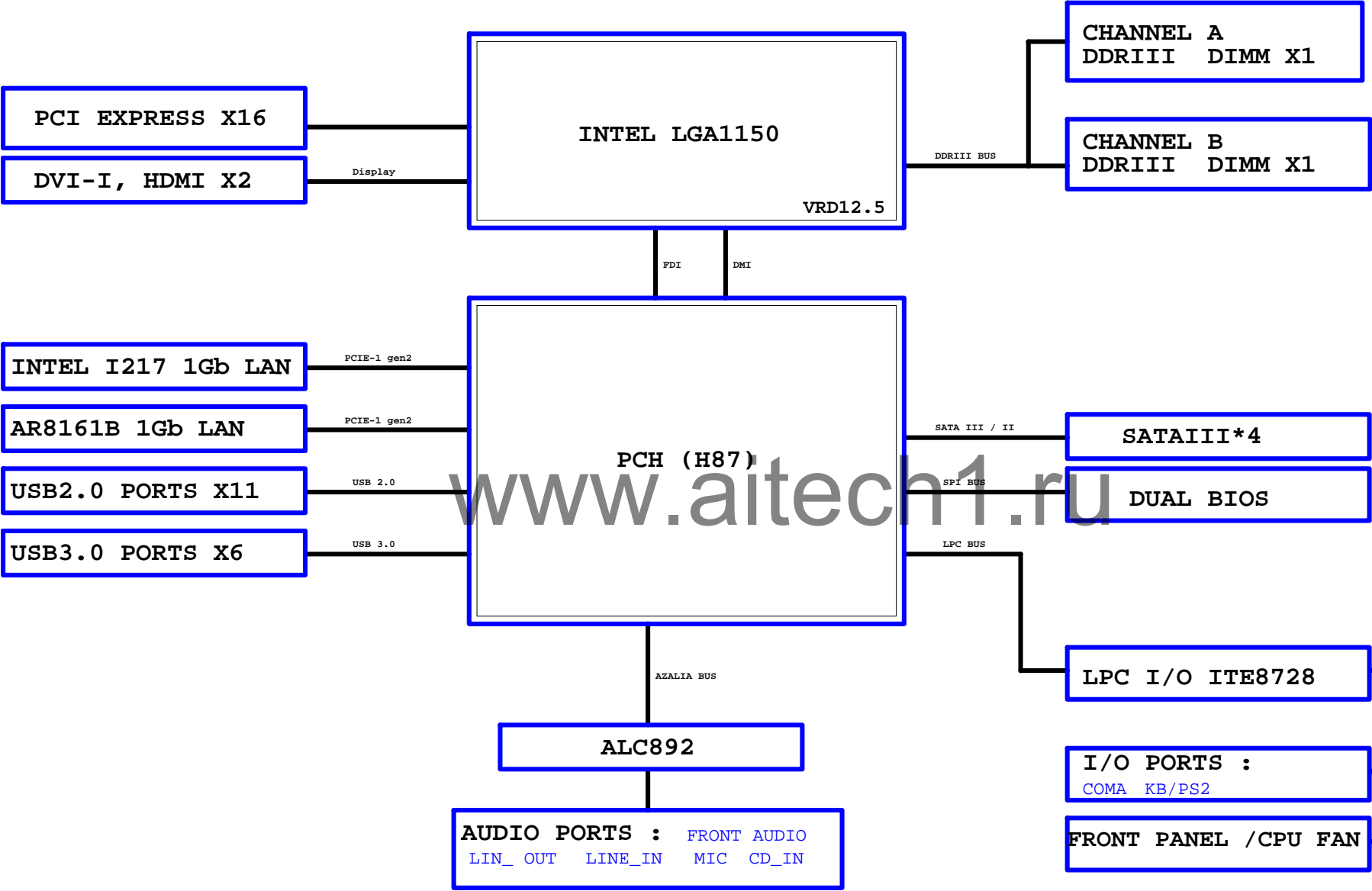
Gigabyte Technology

Title			Cover Sheet
Size	Document Number	GA-H87N	
Custom		Rev	1.1
Date:	Thursday, August 01, 2013	Sheet	1 of 31

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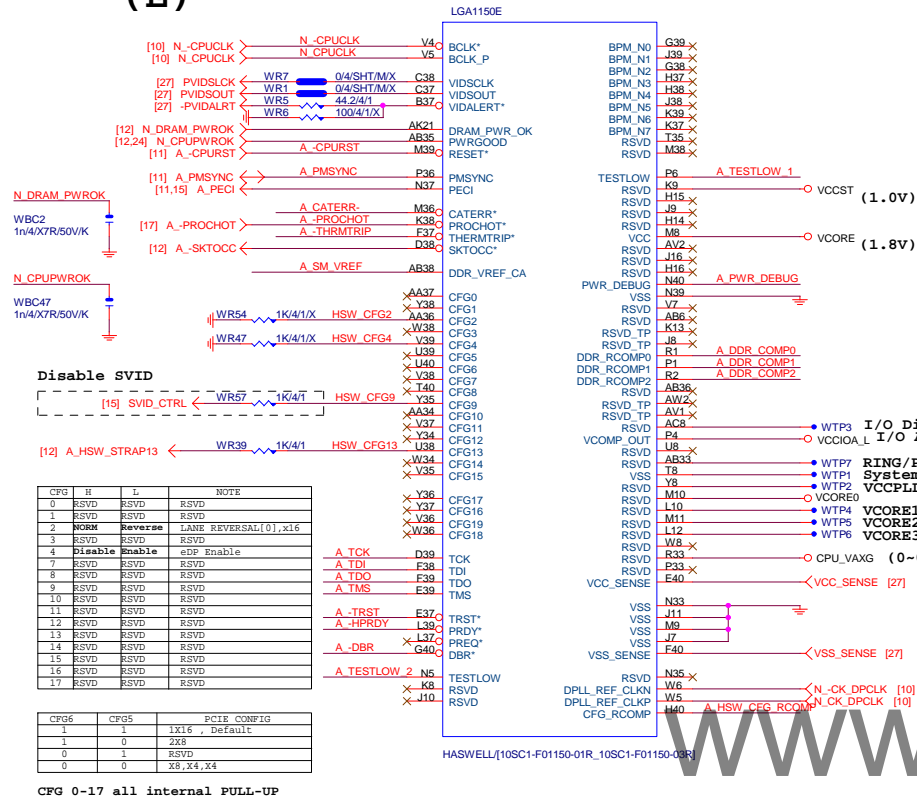
CD

BLOCK DIAGRAM



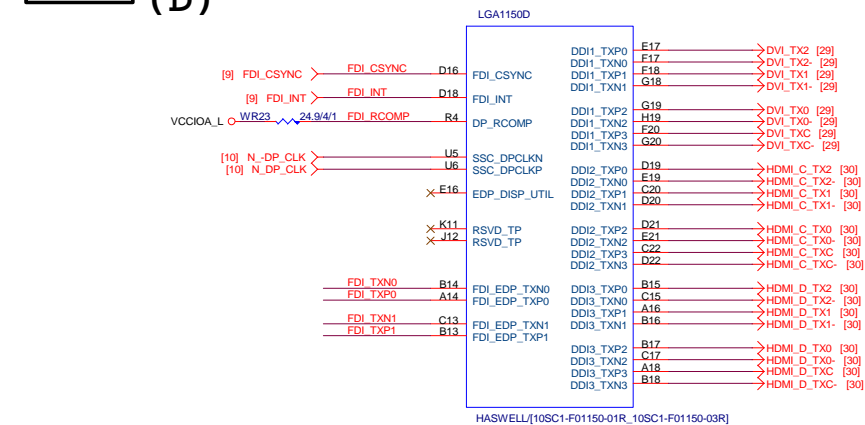
LGA1150

(E)



LGA1150

(D)



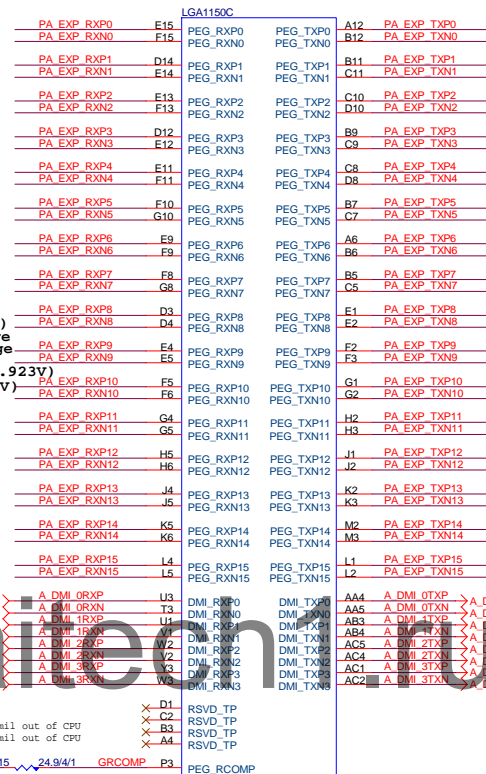
FDI:12/4/5/4/12(breakout min 6/4/4/4/6)
Impedance=85 +- 17.5%

FDI_TXP0_11 >>> FDI_TXP[0..1] [9]
FDI_TXN0_11 >>> FDI_TXN[0..1] [9]

LGA1155

(C)

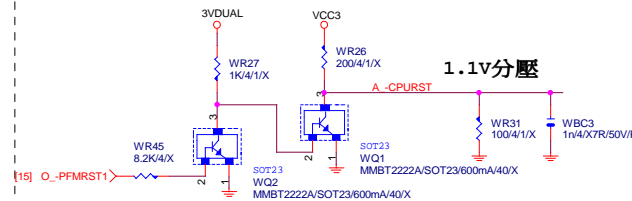
PCIEX16:16/5/5/5/16(breakout min 10/4/4/4/10)
Impedance=80 +- 17.5%



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

PA_EXP_TXP0_15 >>> PA_EXP_TXP[0..15] [14]
PA_EXP_TXN0_15 >>> PA_EXP_TXN[0..15] [14]
PA_EXP_RXP0_15 >>> PA_EXP_RXP[0..15] [14]
PA_EXP_RXN0_15 >>> PA_EXP_RXN[0..15] [14]

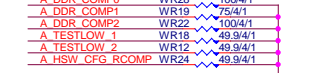
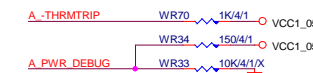
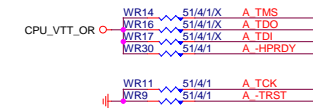
-CPURST



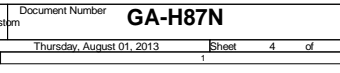
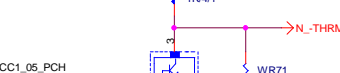
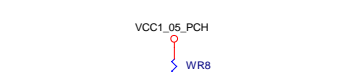
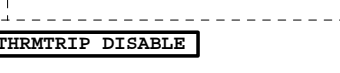
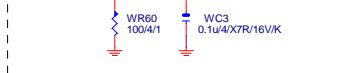
CPU SVID



CPU PU/PD

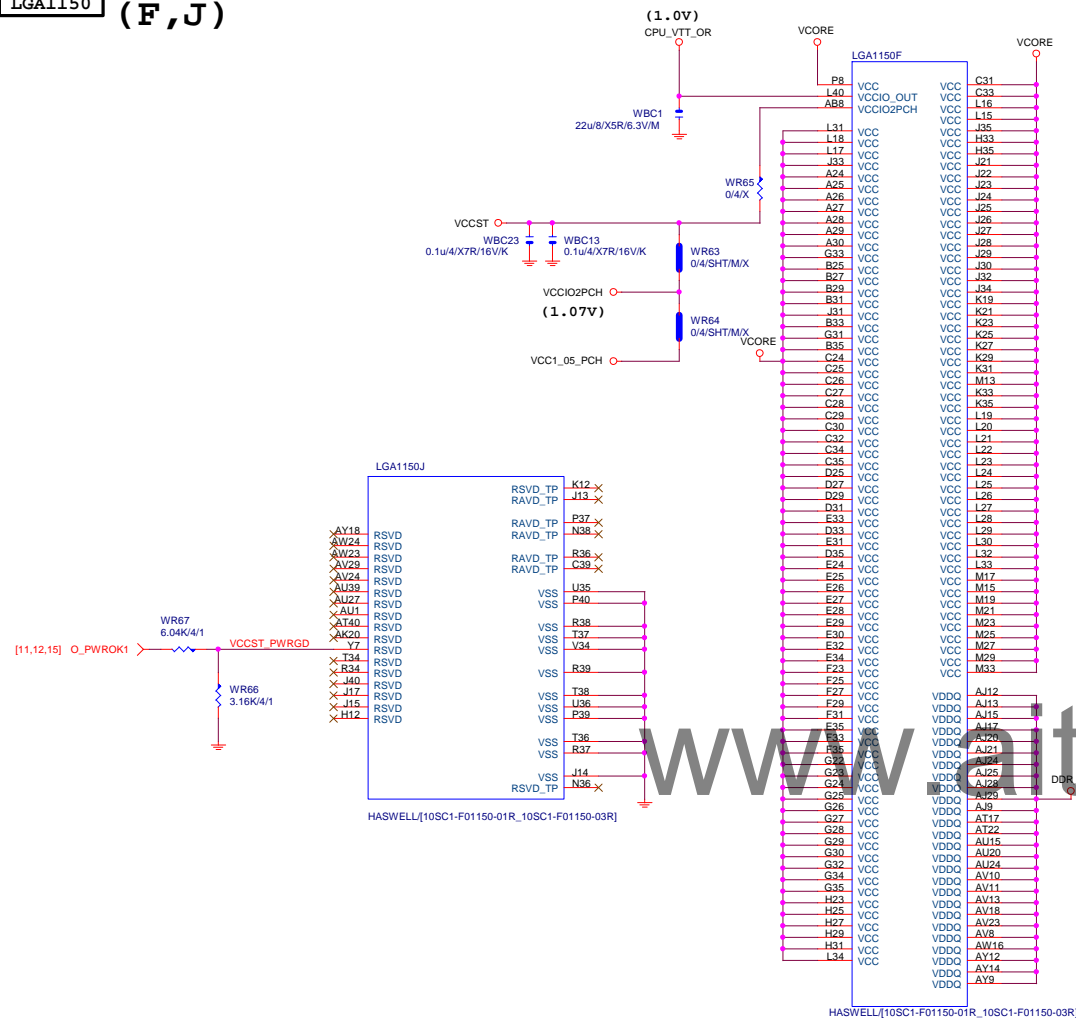


SM REF



LGA1150A			
MAAA0	AU13	DDR0_M0	DDR0_D00
MAAA1	AV16	DDR0_M1	DDR0_D01
MAAA2	AU16	DDR0_M2	DDR0_D02
MAAA3	AW17	DDR0_M3	DDR0_D03
MAAA4	AU17	DDR0_M4	DDR0_D04
MAAA5	AU18	DDR0_M5	DDR0_D05
MAAA6	AV17	DDR0_M6	DDR0_D06
MAAA7	AT18	DDR0_M7	DDR0_D07
MAAA8	AU18	DDR0_M8	DDR0_D08
MAAA9	AT19	DDR0_M9	DDR0_D09
MAAA10	AW11	DDR0_M10	DDR0_D10
MAAA11	AV19	DDR0_M11	DDR0_D11
MAAA12	AU19	DDR0_M12	DDR0_D12
MAAA13	AY10	DDR0_M13	DDR0_D13
MAAA14	AT20	DDR0_M14	DDR0_D14
MAAA15	AU21	DDR0_M15	DDR0_D15
MODT_A0	AW10	DDR0_ODT0	DDR0_ODT0
MODT_A1	AY8	DDR0_ODT1	DDR0_ODT1
AW9	AW9	DDR0_ODT2	DDR0_ODT2
AW8	AW8	DDR0_ODT3	DDR0_ODT3
AW33	AW33	DDR0_ECC0	DDR0_ECC0
AW33	AW33	DDR0_ECC1	DDR0_ECC1
AW33	AW33	DDR0_ECC2	DDR0_ECC2
AW33	AW33	DDR0_ECC3	DDR0_ECC3
AW33	AW33	DDR0_ECC4	DDR0_ECC4
AW33	AW33	DDR0_ECC5	DDR0_ECC5
AW33	AW33	DDR0_ECC6	DDR0_ECC6
AW33	AW33	DDR0_ECC7	DDR0_ECC7
SBAA0	SBAA0	DDR0_BA0	DDR0_D031
SBAA1	SBAA1	DDR0_BA1	DDR0_D032
SBAA2	SBAA2	DDR0_BA2	DDR0_D033
CKEA0	CKEA0	DDR0_CKE0	DDR0_D034
CKEA1	CKEA1	DDR0_CKE1	DDR0_D035
CSA0	CSA0	DDR0_CS_N0	DDR0_D041
CSA1	CSA1	DDR0_CS_N1	DDR0_D042
DCLKA0	DCLKA0	DDR0_CLK_P0	DDR0_D043
DCLKA1	DCLKA1	DDR0_CLK_P1	DDR0_D044
DCLKA2	DCLKA2	DDR0_CLK_P2	DDR0_D045
DCLKA3	DCLKA3	DDR0_CLK_P3	DDR0_D046
DCLKA4	DCLKA4	DDR0_CLK_P4	DDR0_D047
DCLKA5	DCLKA5	DDR0_CLK_P5	DDR0_D048
DCLKA6	DCLKA6	DDR0_CLK_P6	DDR0_D049
DCLKA7	DCLKA7	DDR0_CLK_P7	DDR0_D050
DCLKA8	DCLKA8	DDR0_CLK_P8	DDR0_D051
DCLKA9	DCLKA9	DDR0_CLK_P9	DDR0_D052
DCLKA10	DCLKA10	DDR0_CLK_P10	DDR0_D053
DCLKA11	DCLKA11	DDR0_CLK_P11	DDR0_D054
DCLKA12	DCLKA12	DDR0_CLK_P12	DDR0_D055
DCLKA13	DCLKA13	DDR0_CLK_P13	DDR0_D056
DCLKA14	DCLKA14	DDR0_CLK_P14	DDR0_D057
DCLKA15	DCLKA15	DDR0_CLK_P15	DDR0_D058
DCLKA16	DCLKA16	DDR0_CLK_P16	DDR0_D059
DCLKA17	DCLKA17	DDR0_CLK_P17	DDR0_D060
DCLKA18	DCLKA18	DDR0_CLK_P18	DDR0_D061
DCLKA19	DCLKA19	DDR0_CLK_P19	DDR0_D062
DCLKA20	DCLKA20	DDR0_CLK_P20	DDR0_D063
DCLKA21	DCLKA21	DDR0_CLK_P21	DDR0_D064
DCLKA22	DCLKA22	DDR0_CLK_P22	DDR0_D065
DCLKA23	DCLKA23	DDR0_CLK_P23	DDR0_D066
DCLKA24	DCLKA24	DDR0_CLK_P24	DDR0_D067
DCLKA25	DCLKA25	DDR0_CLK_P25	DDR0_D068
DCLKA26	DCLKA26	DDR0_CLK_P26	DDR0_D069
DCLKA27	DCLKA27	DDR0_CLK_P27	DDR0_D070
DCLKA28	DCLKA28	DDR0_CLK_P28	DDR0_D071
DCLKA29	DCLKA29	DDR0_CLK_P29	DDR0_D072
DCLKA30	DCLKA30	DDR0_CLK_P30	DDR0_D073
DCLKA31	DCLKA31	DDR0_CLK_P31	DDR0_D074
DCLKA32	DCLKA32	DDR0_CLK_P32	DDR0_D075
DCLKA33	DCLKA33	DDR0_CLK_P33	DDR0_D076
DCLKA34	DCLKA34	DDR0_CLK_P34	DDR0_D077
DCLKA35	DCLKA35	DDR0_CLK_P35	DDR0_D078
DCLKA36	DCLKA36	DDR0_CLK_P36	DDR0_D079
DCLKA37	DCLKA37	DDR0_CLK_P37	DDR0_D080
DCLKA38	DCLKA38	DDR0_CLK_P38	DDR0_D081
DCLKA39	DCLKA39	DDR0_CLK_P39	DDR0_D082
DCLKA40	DCLKA40	DDR0_CLK_P40	DDR0_D083
DCLKA41	DCLKA41	DDR0_CLK_P41	DDR0_D084
DCLKA42	DCLKA42	DDR0_CLK_P42	DDR0_D085
DCLKA43	DCLKA43	DDR0_CLK_P43	DDR0_D086
DCLKA44	DCLKA44	DDR0_CLK_P44	DDR0_D087
DCLKA45	DCLKA45	DDR0_CLK_P45	DDR0_D088
DCLKA46	DCLKA46	DDR0_CLK_P46	DDR0_D089
DCLKA47	DCLKA47	DDR0_CLK_P47	DDR0_D090
DCLKA48	DCLKA48	DDR0_CLK_P48	DDR0_D091
DCLKA49	DCLKA49	DDR0_CLK_P49	DDR0_D092
DCLKA50	DCLKA50	DDR0_CLK_P50	DDR0_D093
DCLKA51	DCLKA51	DDR0_CLK_P51	DDR0_D094
DCLKA52	DCLKA52	DDR0_CLK_P52	DDR0_D095
DCLKA53	DCLKA53	DDR0_CLK_P53	DDR0_D096
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DCLKA55	DCLKA55	DDR0_CLK_P55	DDR0_D098
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DCLKA57	DCLKA57	DDR0_CLK_P57	DDR0_D100
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DCLKA60	DCLKA60	DDR0_CLK_P60	DDR0_D103
DCLKA61	DCLKA61	DDR0_CLK_P61	DDR0_D104
DCLKA62	DCLKA62	DDR0_CLK_P62	DDR0_D105
DCLKA63	DCLKA63	DDR0_CLK_P63	DDR0_D106
DCLKA64	DCLKA64	DDR0_CLK_P64	DDR0_D107
DCLKA65	DCLKA65	DDR0_CLK_P65	DDR0_D108
DCLKA66	DCLKA66	DDR0_CLK_P66	DDR0_D109
DCLKA67	DCLKA67	DDR0_CLK_P67	DDR0_D110
DCLKA68	DCLKA68	DDR0_CLK_P68	DDR0_D111
DCLKA69	DCLKA69	DDR0_CLK_P69	DDR0_D112
DCLKA70	DCLKA70	DDR0_CLK_P70	DDR0_D113
DCLKA71	DCLKA71	DDR0_CLK_P71	DDR0_D114
DCLKA72	DCLKA72	DDR0_CLK_P72	DDR0_D115
DCLKA73	DCLKA73	DDR0_CLK_P73	DDR0_D116
DCLKA74	DCLKA74	DDR0_CLK_P74	DDR0_D117
DCLKA75	DCLKA75	DDR0_CLK_P75	DDR0_D118
DCLKA76	DCLKA76	DDR0_CLK_P76	DDR0_D119
DCLKA77	DCLKA77	DDR0_CLK_P77	DDR0_D120
DCLKA78	DCLKA78	DDR0_CLK_P78	DDR0_D121
DCLKA79	DCLKA79	DDR0_CLK_P79	DDR0_D122
DCLKA80	DCLKA80	DDR0_CLK_P80	DDR0_D123
DCLKA81	DCLKA81	DDR0_CLK_P81	DDR0_D124
DCLKA82	DCLKA82	DDR0_CLK_P82	DDR0_D125
DCLKA83	DCLKA83	DDR0_CLK_P83	DDR0_D126
DCLKA84	DCLKA84	DDR0_CLK_P84	DDR0_D127
DCLKA85	DCLKA85	DDR0_CLK_P85	DDR0_D128
DCLKA86	DCLKA86	DDR0_CLK_P86	DDR0_D129
DCLKA87	DCLKA87	DDR0_CLK_P87	DDR0_D130
DCLKA88	DCLKA88	DDR0_CLK_P88	DDR0_D131
DCLKA89	DCLKA89	DDR0_CLK_P89	DDR0_D132
DCLKA90	DCLKA90	DDR0_CLK_P90	DDR0_D133
DCLKA91	DCLKA91	DDR0_CLK_P91	DDR0_D134
DCLKA92	DCLKA92	DDR0_CLK_P92	DDR0_D135
DCLKA93	DCLKA93	DDR0_CLK_P93	DDR0_D136
DCLKA94	DCLKA94	DDR0_CLK_P94	DDR0_D137
DCLKA95	DCLKA95	DDR0_CLK_P95	DDR0_D138
DCLKA96	DCLKA96	DDR0_CLK_P96	DDR0_D139
DCLKA97	DCLKA97	DDR0_CLK_P97	DDR0_D140
DCLKA98	DCLKA98	DDR0_CLK_P98	DDR0_D141
DCLKA99	DCLKA99	DDR0_CLK_P99	DDR0_D142
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DCLKA156	DCLKA156	DDR0_CLK_P156	DDR0_D199
DCLKA157	DCLKA157	DDR0_CLK_P157	DDR0_D200
DCLKA158	DCLKA158	DDR0_CLK_P158	DDR0_D201
DCLKA159	DCLKA159	DDR0_CLK_P159	DDR0_D202
DCLKA160	DCLKA160	DDR0_CLK_P160	DDR0_D203
DCLKA161	DCLKA161	DDR0_CLK_P161	DDR0_D204
DCLKA162	DCLKA162	DDR0_CLK_P162	DDR0_D205
DCLKA163	DCLKA163	DDR0_CLK_P163	DDR0_D206
DCLKA164	DCLKA164	DDR0_CLK_P164	DDR0_D207
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DCLKA180	DCLKA180	DDR0_CLK_P180	DDR0_D223
DCLKA181	DCLKA181	DDR0_CLK_P181	DDR0_D224
DCLKA182	DCLKA182	DDR0_CLK_P182	DDR0_D225
DCLKA183	DCLKA183	DDR0_CLK_P183	DDR0_D226
DCLKA184	DCLKA184	DDR0_CLK_P184	DDR0_D227
DCLKA185	DCLKA185	DDR0_CLK_P185	DDR0_D228
DCLKA186	DCLKA186	DDR0_CLK_P186	DDR0_D229
DCLKA187	DCLKA187	DDR0_CLK_P187	DDR0_D230
DCLKA188	DCLKA188	DDR0_CLK_P188	DDR0_D231
DCLKA189	DCLKA189	DDR0_CLK_P189	DDR0_D232
DCLKA190	DCLKA190	DDR0_CLK_P190	DDR0_D233
DCLKA191	DCLKA191	DDR0_CLK_P191	DDR0_D234
DCLKA192	DCLKA192	DDR0_CLK_P192	DDR0_D235
DCLKA193	DCLKA193	DDR0_CLK_P193	DDR0_D236
DCLKA194	DCLKA194	DDR0_CLK_P194	DDR0_D237
DCLKA195	DCLKA195	DDR0_CLK_P195	DDR0_D238
DCLKA196	DCLKA196	DDR0_CLK_P196	DDR0_D239
DCLKA197	DCLKA197	DDR0_CLK_P197	DDR0_D240
DCLKA198	DCLKA198	DDR0_CLK_P198	DDR0_D241
DCLKA199	DCLKA199	DDR0_CLK_P199	DDR0_D242
DCLKA200	DCLKA200	DDR0_CLK_P200	DDR0_D243
DCLKA201	DCLKA201	DDR0_CLK_P201	DDR0_D244
DCLKA202	DCLKA202	DDR0_CLK_P202	DDR0_D245
DCLKA203	DCLKA203	DDR0_CLK_P203	DDR0_D246
DCLKA204	DCLKA204	DDR0_CLK_P204	DDR0_D247
DCLKA205	DCLKA205	DDR0_CLK_P205	DDR0_D248
DCLKA206	DCLKA206	DDR0_CLK_P206	DDR0_D249
DCLKA207	DCLKA207	DDR0_CLK_P207	DDR0_D250
DCLKA208	DCLKA208	DDR0_CLK_P208	DDR0_D251
DCLKA209	DCLKA209	DDR0_CLK_P209	DDR0_D252
DCLKA210	DCLKA210	DDR0_CLK_P210	DDR0_D253
DCLKA211	DCLKA211	DDR0_CLK_P211	DDR0_D254
DCLKA212	DCLKA212	DDR0_CLK_P212	DDR0_D255
DCLKA213	DCLKA213	DDR0_CLK_P213	DDR0_D256
DCLKA214	DCLKA214	DDR0_CLK_P214	DDR0_D257
DCLKA215	DCLKA215	DDR0_CLK_P215	DDR0_D258
DCLKA216	DCLKA216	DDR0_CLK_P216	DDR0_D259
DCLKA217	DCLKA217	DDR0_CLK_P217	DDR0_D260
DCLKA218	DCLKA218	DDR0_CLK_P218	DDR0_D261
DCLKA219	DCLKA219	DDR0_CLK_P219	DDR0_D262
DCLKA220	DCLKA220	DDR0_CLK_P220	DDR0_D263
DCLKA221	DCLKA221	DDR0_CLK_P221	DDR0_D264
DCLKA222	DCLKA222	DDR0_CLK_P222	DDR0_D265
DCLKA223	DCLKA223	DDR0_CLK_P223	DDR0_D266
DCLKA224	DCLKA224	DDR0_CLK_P224	DDR0_D267
DCLKA225	DCLKA225	DDR0_CLK_P225	DDR0_D268
DCLKA226	DCLKA226	DDR0_CLK_P226	DDR0_D269
DCLKA227	DCLKA227	DDR0_CLK_P227	DDR0_D270
DCLKA228	DCLKA228	DDR0_CLK_P228	DDR0_D271
DCLKA229</			

LGA1150 (F,J)

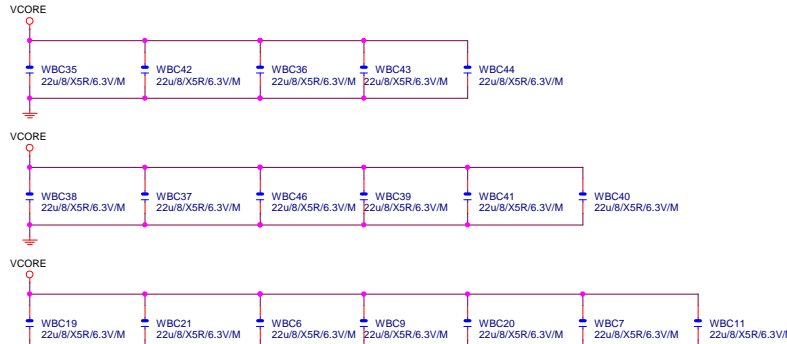


LGA1155 (G,H,I)



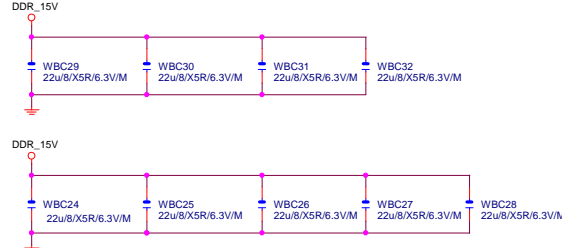
VCore CAP

(X18)



DDR CAP

(X9)



Gigabyte Technology

Title		CPU LGA1150-C	
Size	Custom	Document Number	GA-H87N
Date:	Thursday, August 01, 2013	Sheet	6 of 31
Rev	1.1		

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 B

NR40 7.5K/4/1 PCIE_COMP C

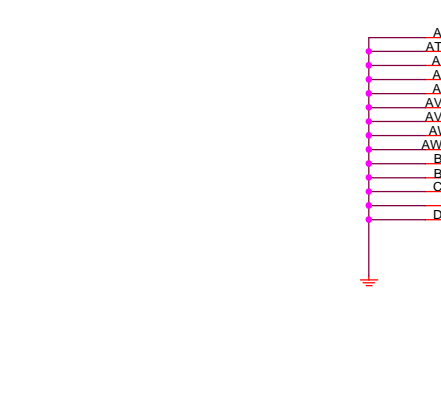
CK -SRCCLK_PCH G

CK SRCCLK_PCH F

MINI PCI-E	ARG1616LB	I217	USB3.0		
		[23]	PCH_USB3_RXP2		
		[23]	PCH_USB3_TXN2		
		[23]	PCH_USB3_TXP2		
		[23]	PCH_USB3_RXN3		
		[23]	PCH_USB3_RXP3		
		[23]	PCH_USB3_TXN3		
		[23]	PCH_USB3_TXP3		
		[22]	LA_ML_IN		
		[22]	LA_ML_IP		
		[22]	LA_ML_ON		
		[22]	LA_ML_OP		
		[23]	LB_ML_IN		
		[23]	LB_ML_IP		
		[23]	LB_ML_ON		
		[23]	LB_ML_OP		
		[31]	MPICIE_IN0		
		[31]	MPICIE_IP0	0.1u4/X7R/16V/K	NBC84PET N5
		[31]	MPICIE_TN0	0.1u4/X7R/16V/K	NBC85PET PS
		[31]	MPICIE_TP0		

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

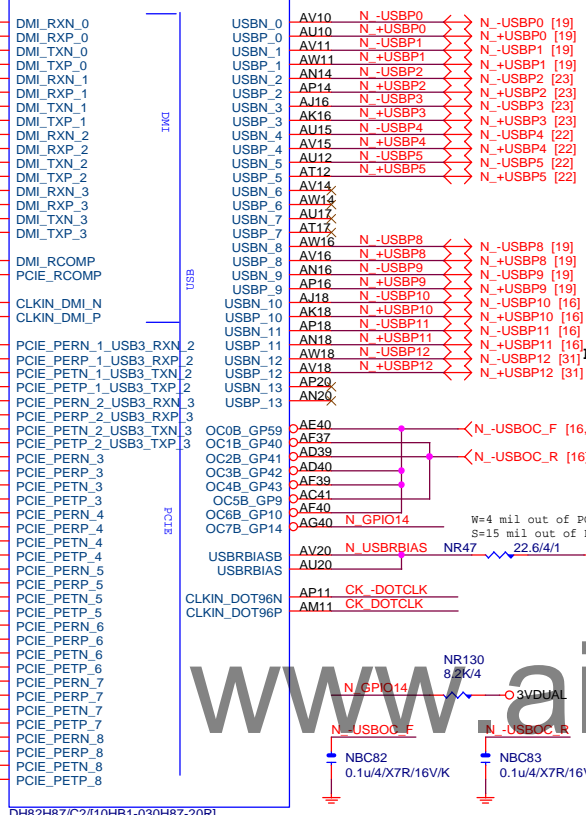
PCIEX1:16/5/5/5/16 (breakout min 8/4/4/4/8)



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

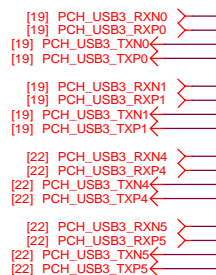
PCHB

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



DH82H87/C2/[10HB1-030H87-20R]

(-)



VCC3

PCB CLK PD



1177 HEATSINK

SB_HEATSIN

GRAY HS

PCH_HS

PCH_HS/(12SP2-S03507-01R)

USE TABLE

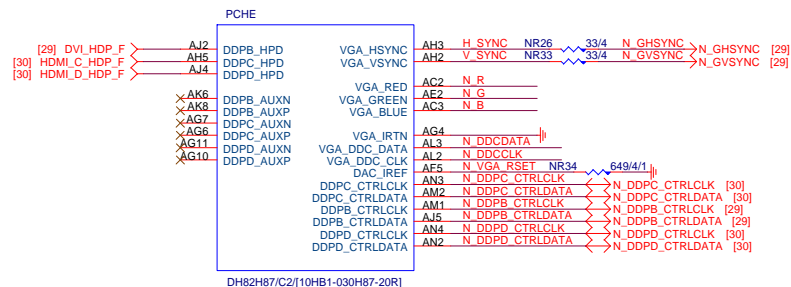
```
OC[3:0]# for Device 29 (ports 0-7)
OC[7:4]# for Device 26 (ports 8-13)
```

USB OC# Configure	
OC0#	F_USB30
OC1#	USB30_LAN2
OC2#	USB30_LAN1
OC3#	N/A
OC4#	F_USB20
OC5#	KB_MS_USB
OC6#	MINI_PCIE
OC7#	Not Use

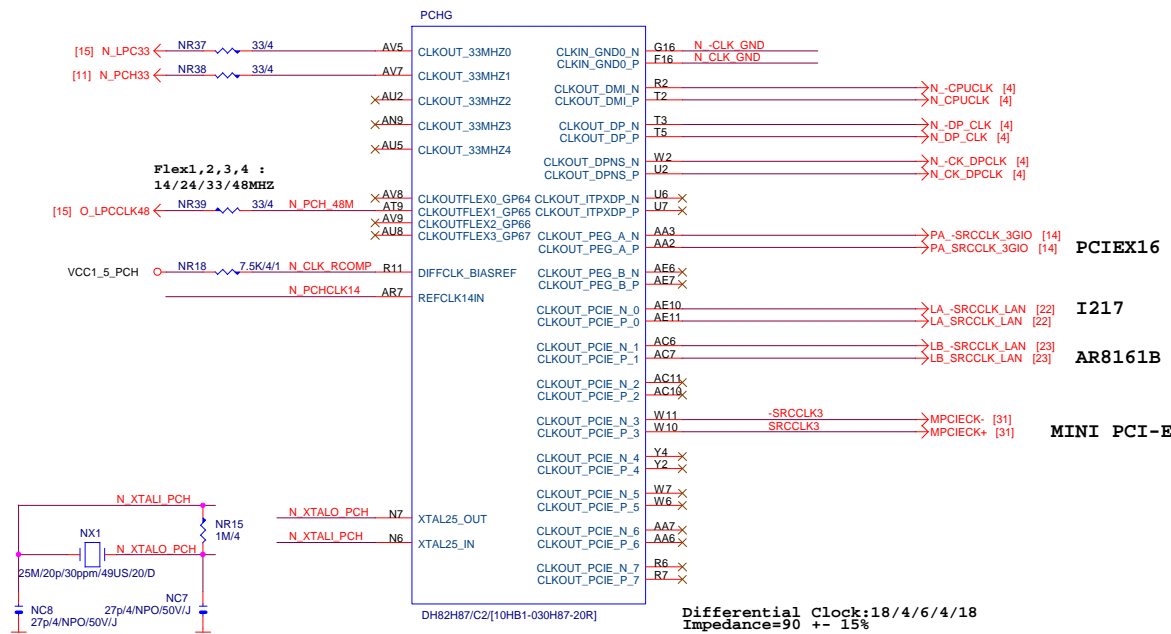
Gigabyte Technology

Title			
PCH FDI,DMI,USB ,PCIE,NVRAM			
Size	Document Number		Rev
Custom	GA-H87N		1:
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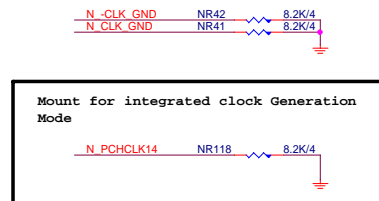
PCH (E)



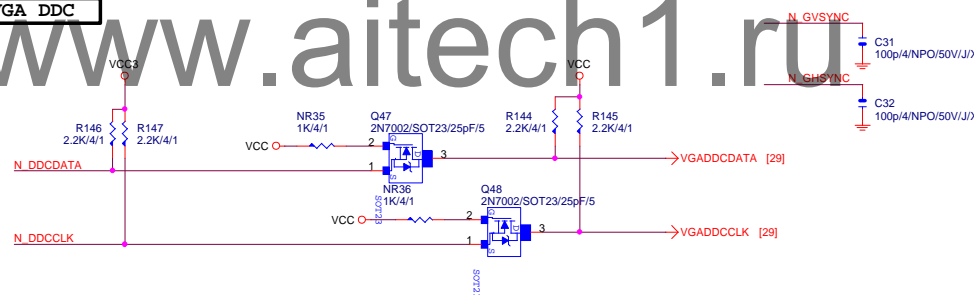
PCH (G)



PCH CLK PD

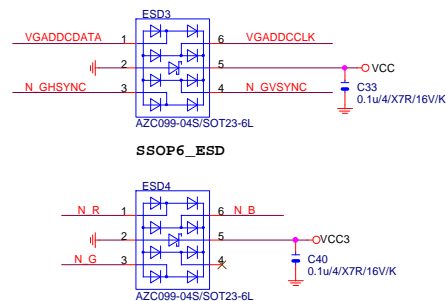


VGA DDC

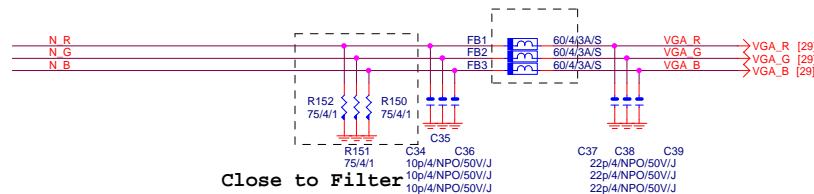


VGA CONNECTOR

VGA ESD



VGA DDC

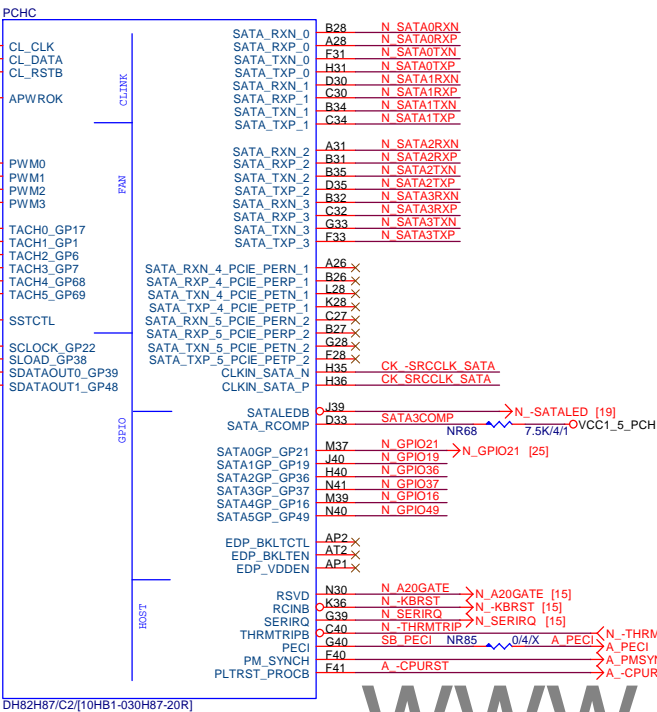


Gigabyte Technology

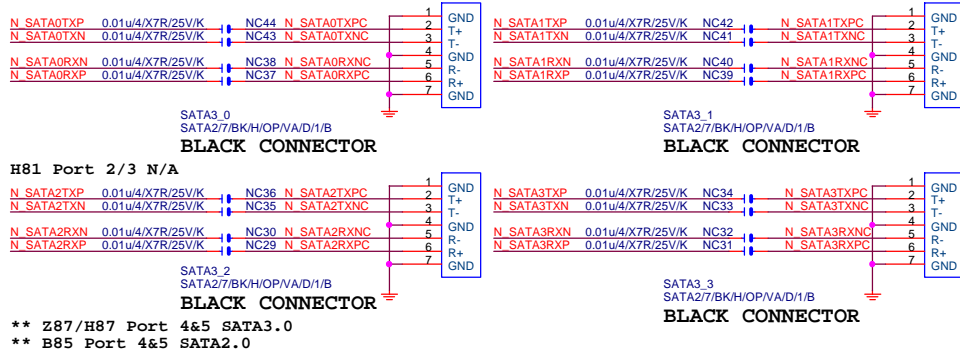
Title			PCH DISPLAY_CLK BUFFER		
Size			GA-H87N		
Date:			Thursday, August 01, 2013		
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(C)

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%

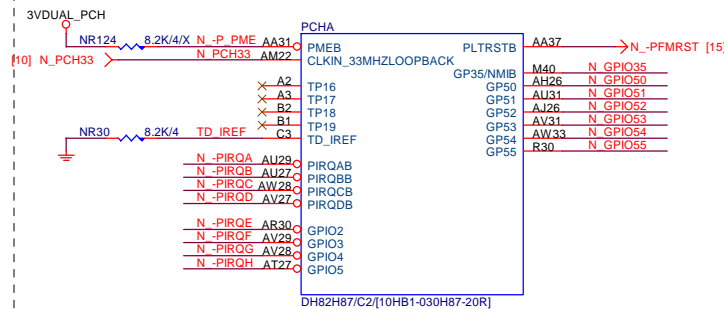


SATA CONNECTOR

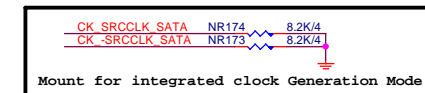


N/A

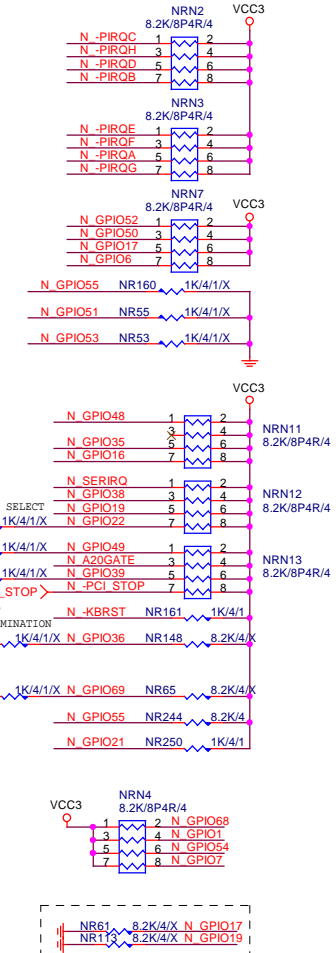
(A)



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



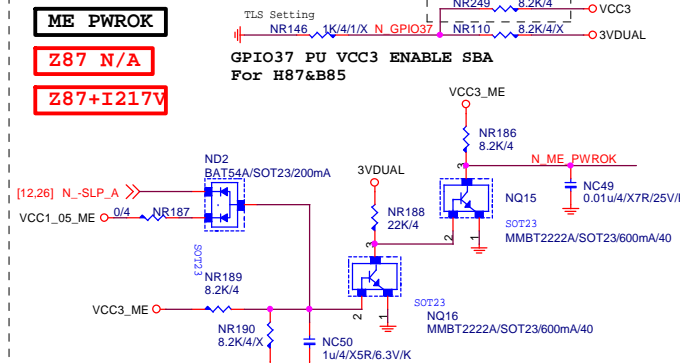
PCH	PU/PD
-----	-------



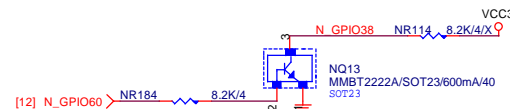
ME PWROK

Z87 N/A

Z87+I217V



GPI038 Ctrl

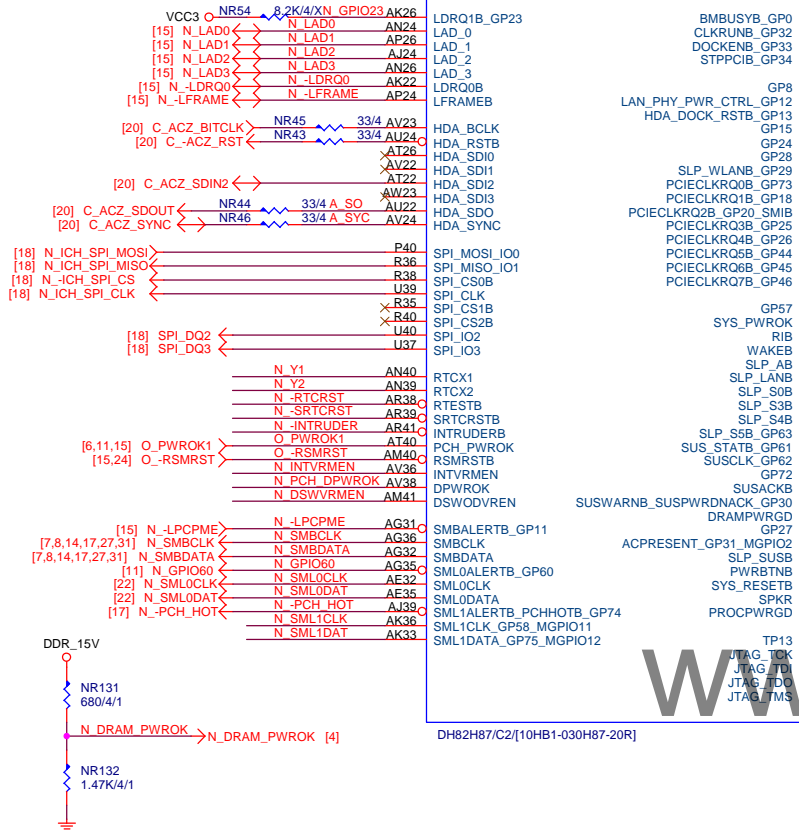


Gigabyte Technology

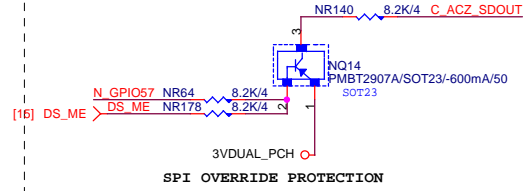
Title			
PCH HOST , SATA, PCI			
Size	Document Number	Rev	
Custom	GA-H87N	1.1	
Date:	Thursday, August 01, 2013	Sheet	11 of 31

PCH (D)

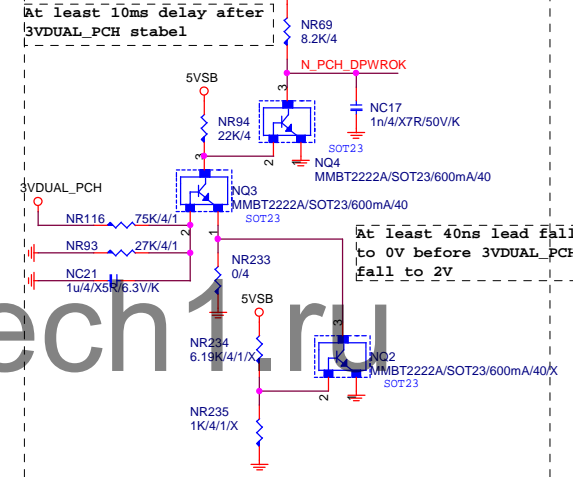
[15] N_LAD[0..3] <-< N_LAD[0..3]



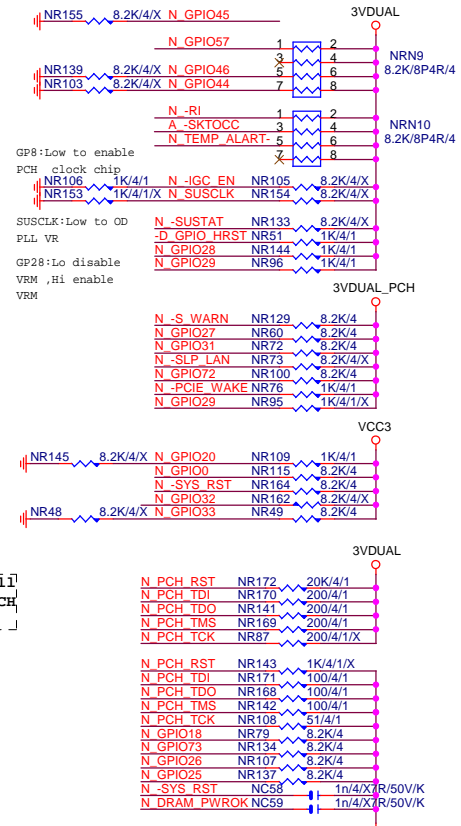
ACZ_SDOUT



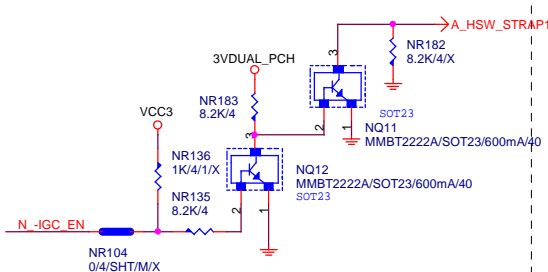
PCH_DPWROK



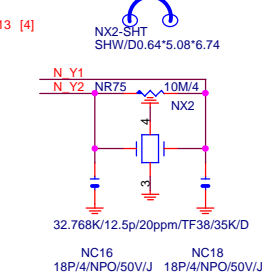
PCH PU/PD



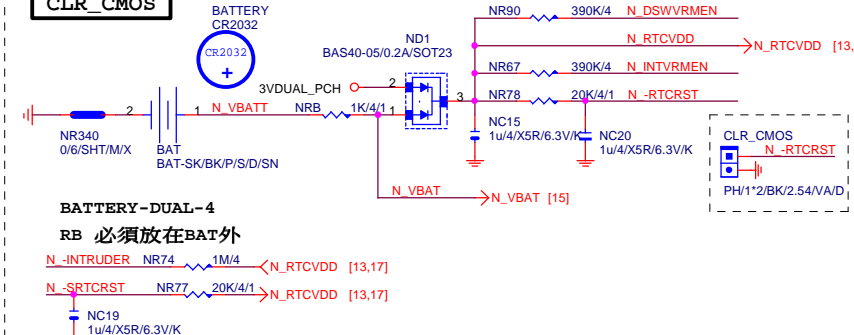
HSW_STRAP13



32.768KHZ



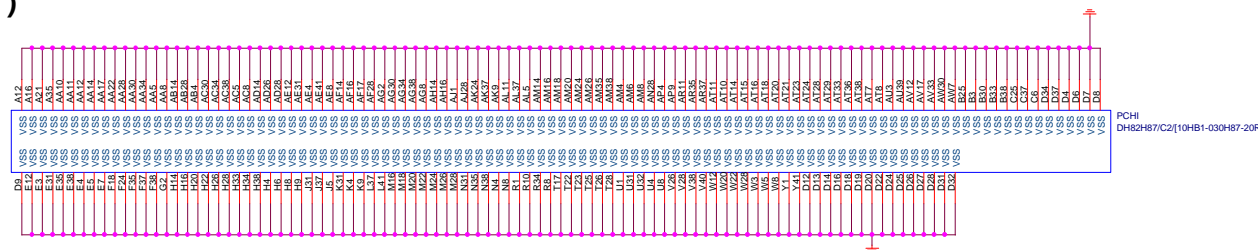
CLR_CMOS



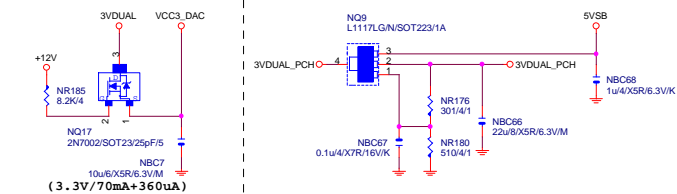
Gigabyte Technology

Title			
PCH GPIO , CTRL , AUDIO			
Size	Document Number	Rev	
Custom	GA-H87N	1.1	
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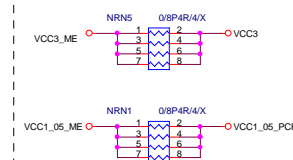
PCH (I)



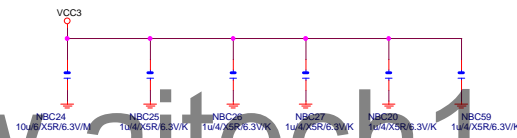
3VDUAL_PCH



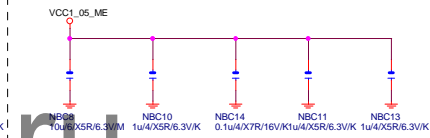
M3 POWER



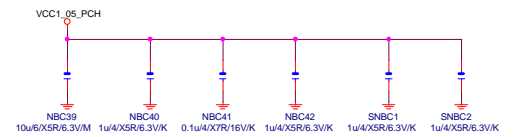
(3.3V) (X6)



(1.05V) (x5)



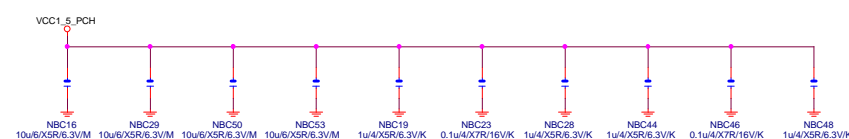
(1.05V)(x6)



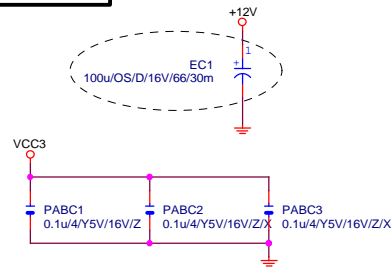
$(1.05V)(x2) + (3.3V)(x2)$



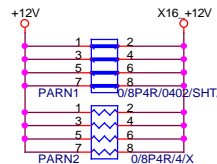
(1.05V) (x10)



PCIEX16 CAP



PCIEX16 PROTECT SHT

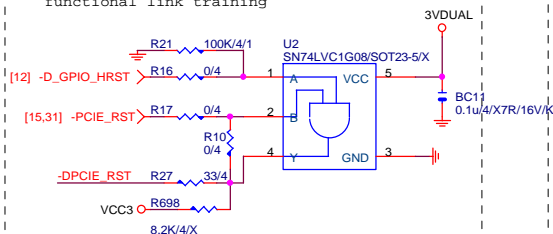


PCIEX16 AC CAP

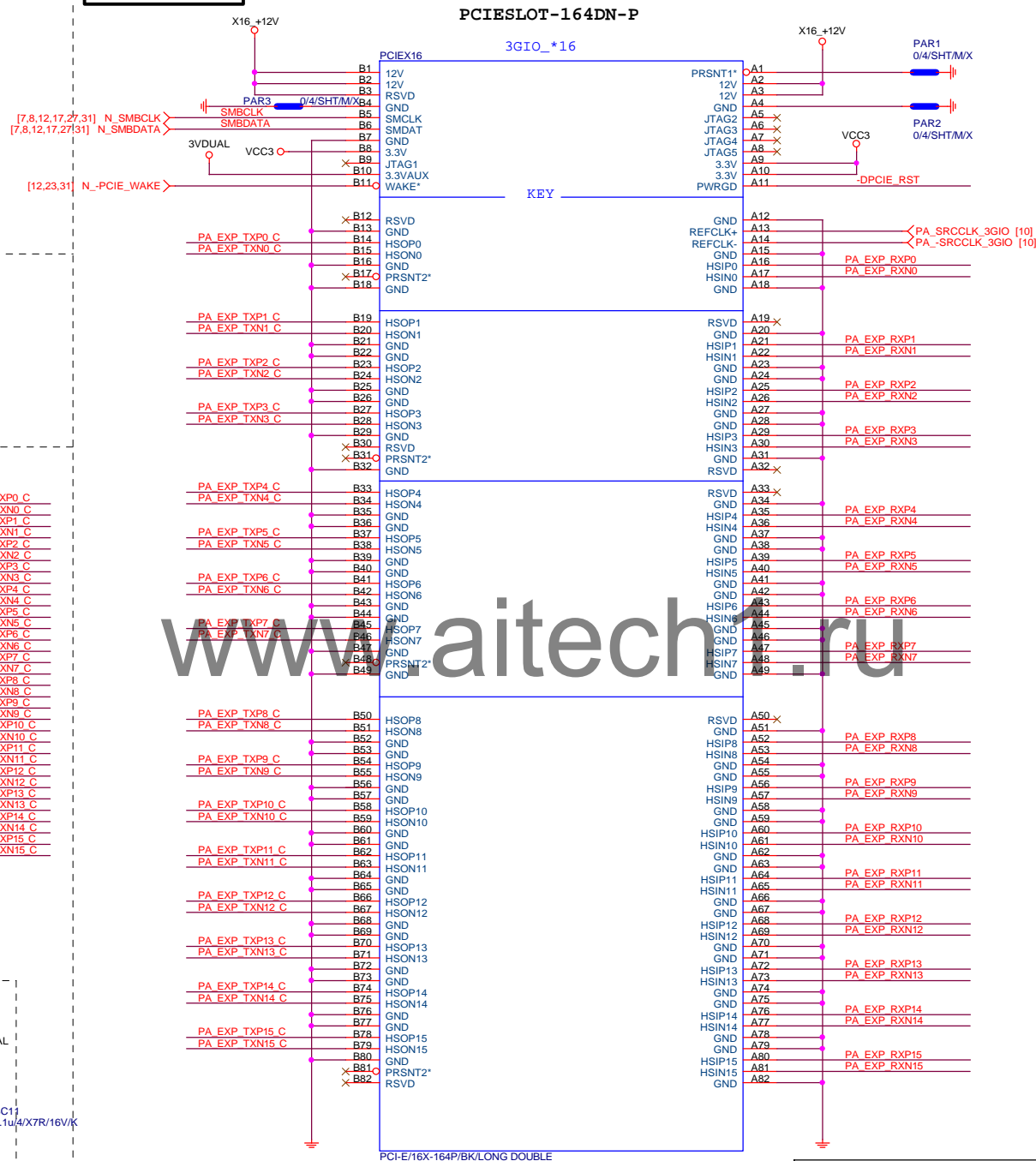
PA EXP TXP0	PAC5	0.22u4/X5R/6.3V/K	PA EXP TXP0 C
PA EXP TXN0	PAC4	0.22u4/X5R/6.3V/K	PA EXP TXN0 C
PA EXP TXP1	PAC6	0.22u4/X5R/6.3V/K	PA EXP TXP1 C
PA EXP TXN1	PAC7	0.22u4/X5R/6.3V/K	PA EXP TXN1 C
PA EXP TXP2	PAC8	0.22u4/X5R/6.3V/K	PA EXP TXP2 C
PA EXP TXN2	PAC9	0.22u4/X5R/6.3V/K	PA EXP TXN2 C
PA EXP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

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



PCIEX16 SLOT



BLACK CONNECTOR

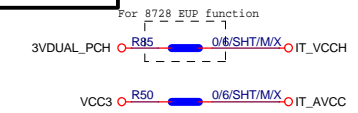
Gigabyte Technology

Title			PCI EXPRESS * 16		
Size			Document Number		
Custom			GA-H87N		
Date:			Thursday, August 01, 2013		
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Rev			1.1		

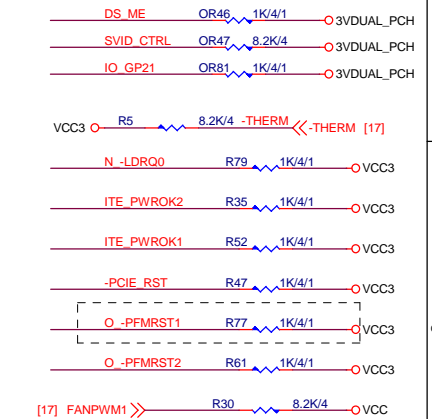
SIO IT8728F

【技術通報R&D技術通報151】
有使用PRINT PORT的 MODEL
需使用新料號:10HP2-118728-72R

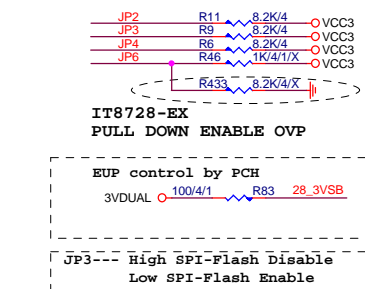
PWR SHT



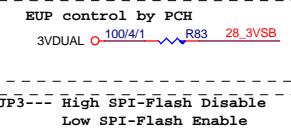
SIO PU



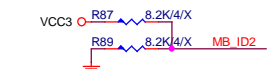
SIO STRAP



IT8728-EX
PULL DOWN ENABLE OVP

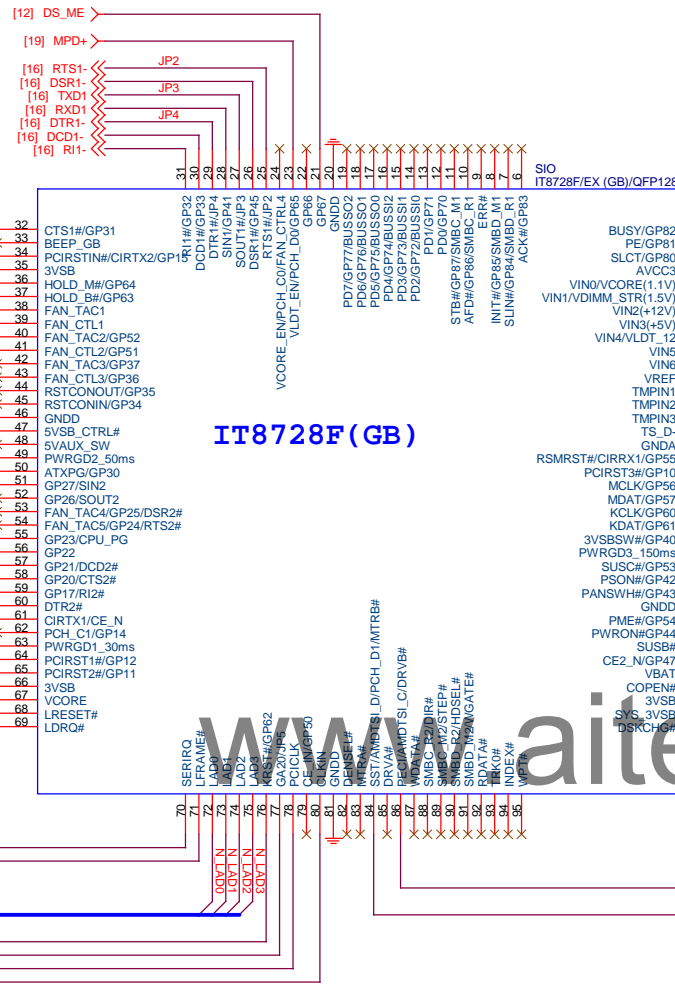


MB ID



Gigabyte Technology

Title				ITE 8728 LPC IO
Size	Document Number	GA-H87N		Rev
Custom				1.1
Date:	Thursday, August 01, 2013	Sheet	15	of 31



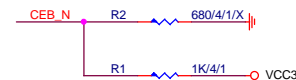
IT8728F (GB)

www.aitech1.ru

IT8728F NOTE

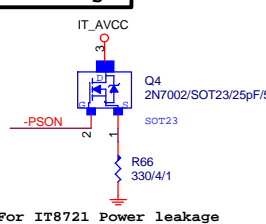
IT8728	
PIN121	VCORE_EN/PCH_C0
PIN120	VLDI_EN/PCH_D0
PIN19	ATXPG
PIN31	PCH_C1
PIN53	SST/AMDTSI_D/MTRB#/PCH_D1
PIN55	PECI/AMDTSI_C/DRV#
PIN66	SYS_3VSB
PIN70	GP47
PIN95	VIN2 (VCC5)
PIN96	VIN1 (VCC12)
PIN97	VIN1/VDIMM_STR(1.5V)
PIN98	VIN0/VCORE(1.1V)/NC

DUAL BIOS OPT STRAP



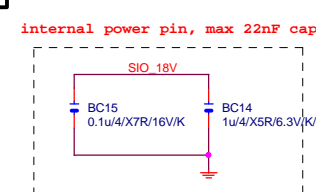
SIO CAP

Power leakage

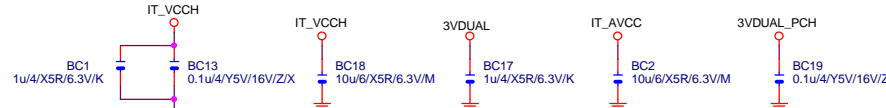


For IT8721 Power leakage

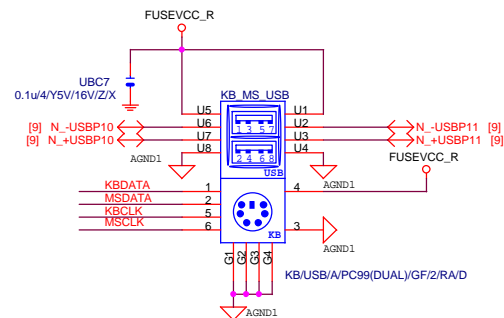
SIO_18V



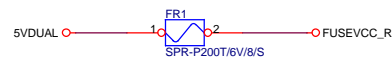
FOR LOW TEMP POWER ON INTO TEST MODE ISSUE



KB/MS

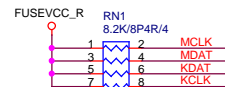


USB2.0 PWR

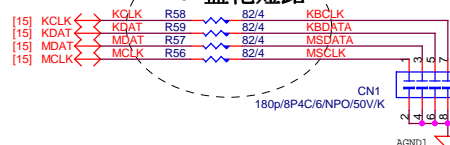


Close to connector
KB_MS_USB 2-Port 2.0A

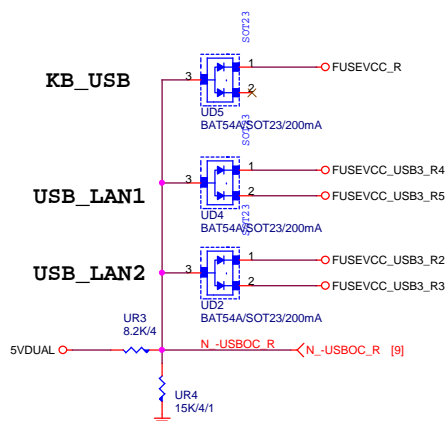
KB_MS



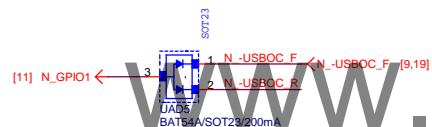
FOR鹽化短路



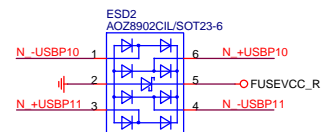
-USB0C_R



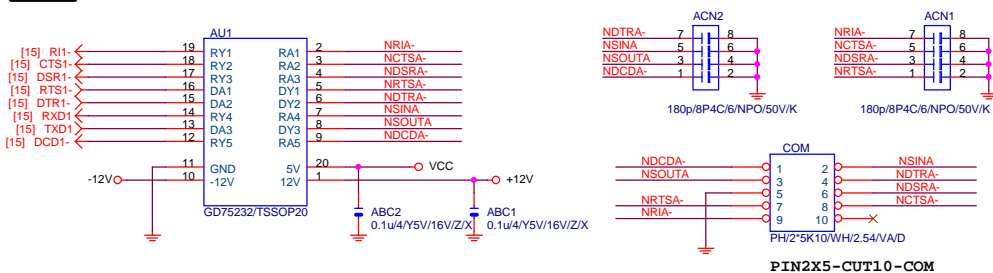
USB POWER PROTECT



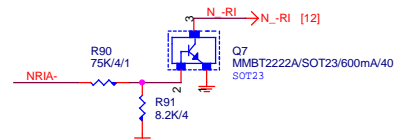
USB2.0 ESD



COM



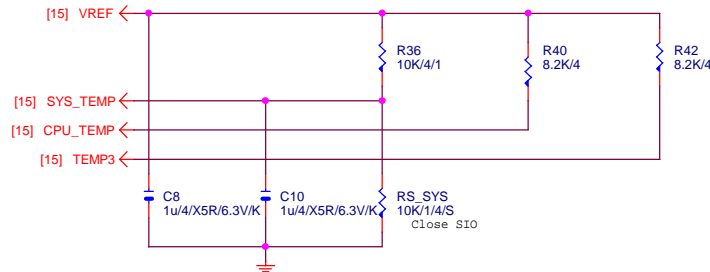
COM RI



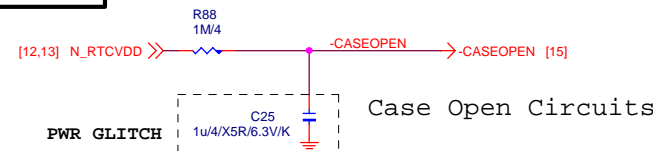
Gigabyte Technology

Title			
COM,-RI,KB_USB,USB_ESATA,-PROCHOT			
Size	Document Number	Rev	
Custom	GA-H87N	1.1	
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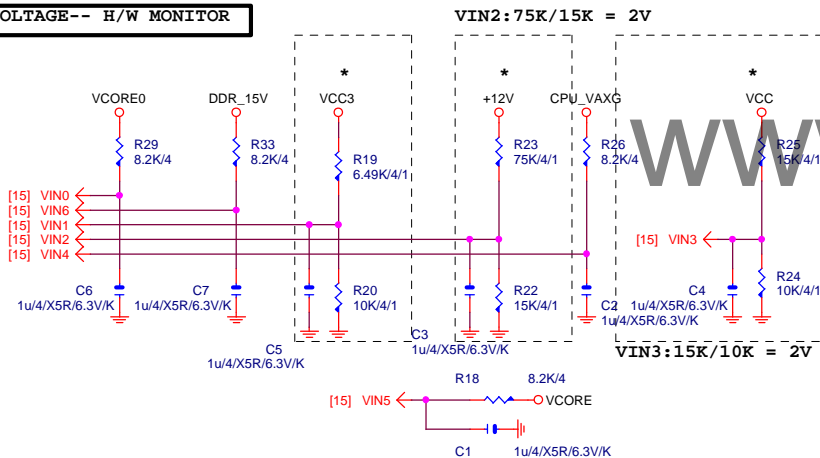
TEMP H/W MONITOR



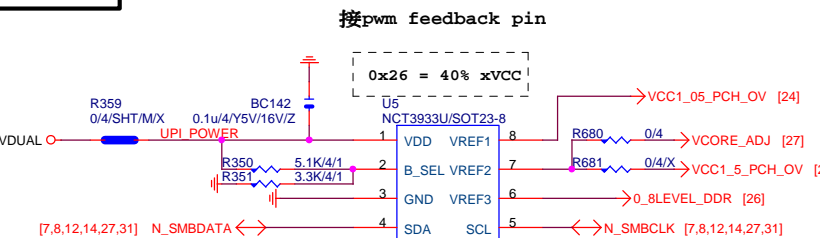
CASE OPEN



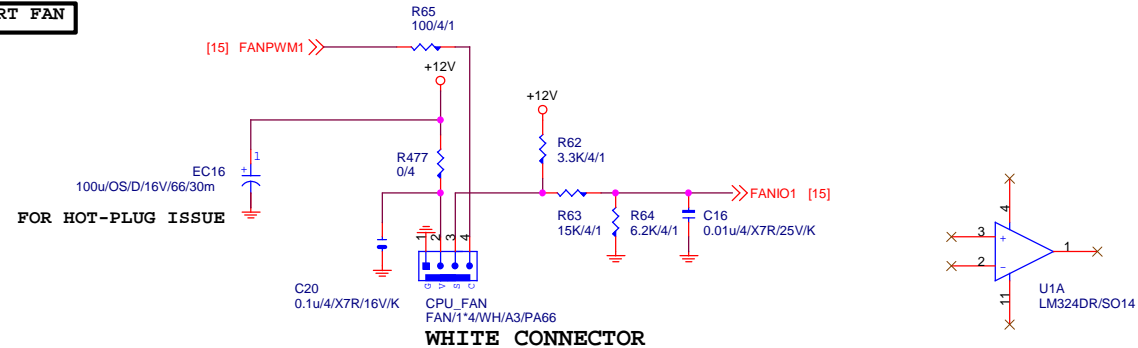
VOLTAGE-- H/W MONITOR



OV NCT3933

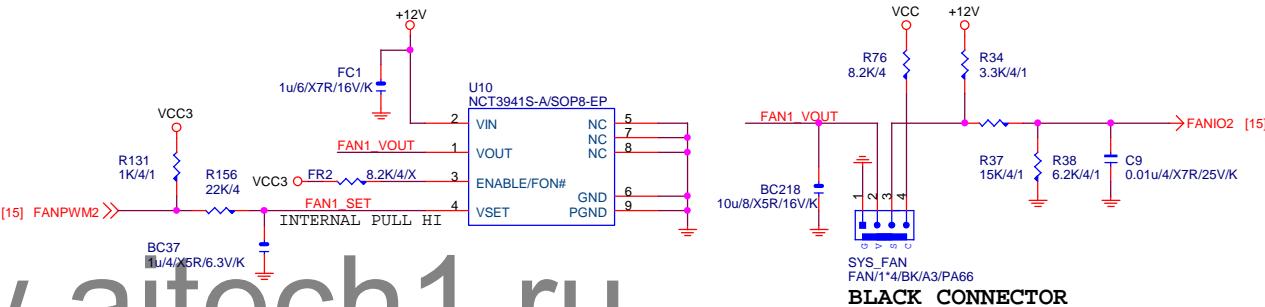


CPU SMART FAN

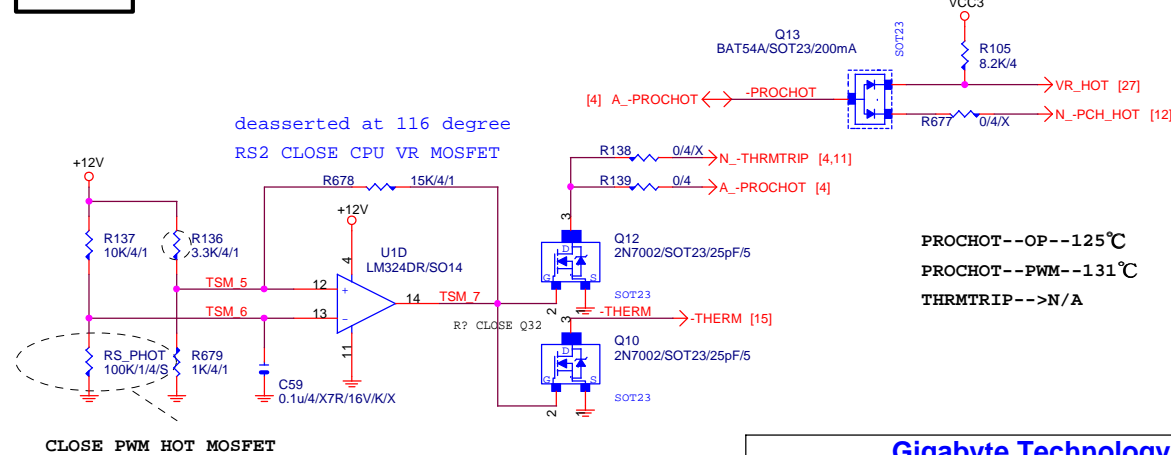


SYS SMART FAN

Linear SYS_FAN



-PROHOT

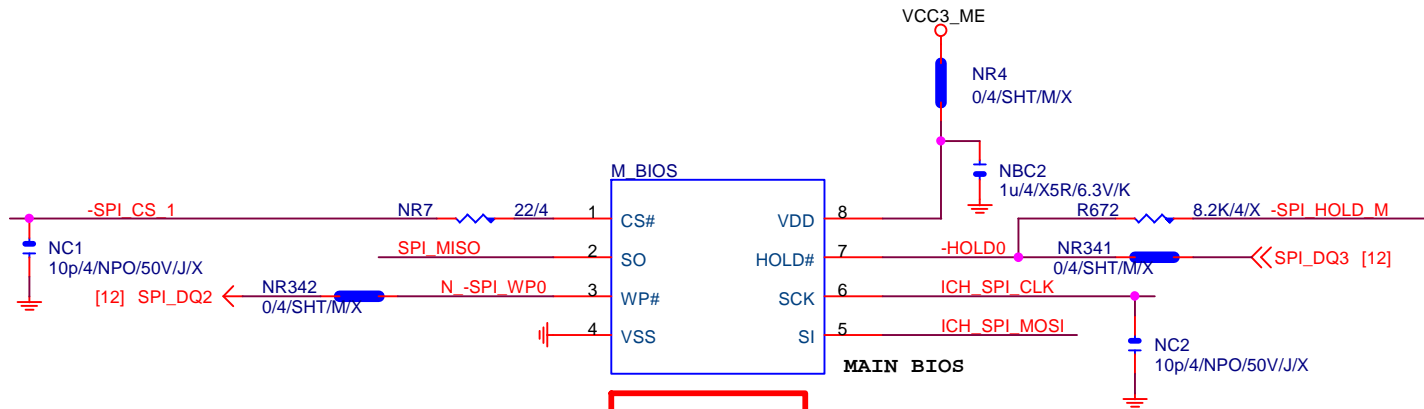


Gigabyte Technology

HWM,FAN CTRL,OV

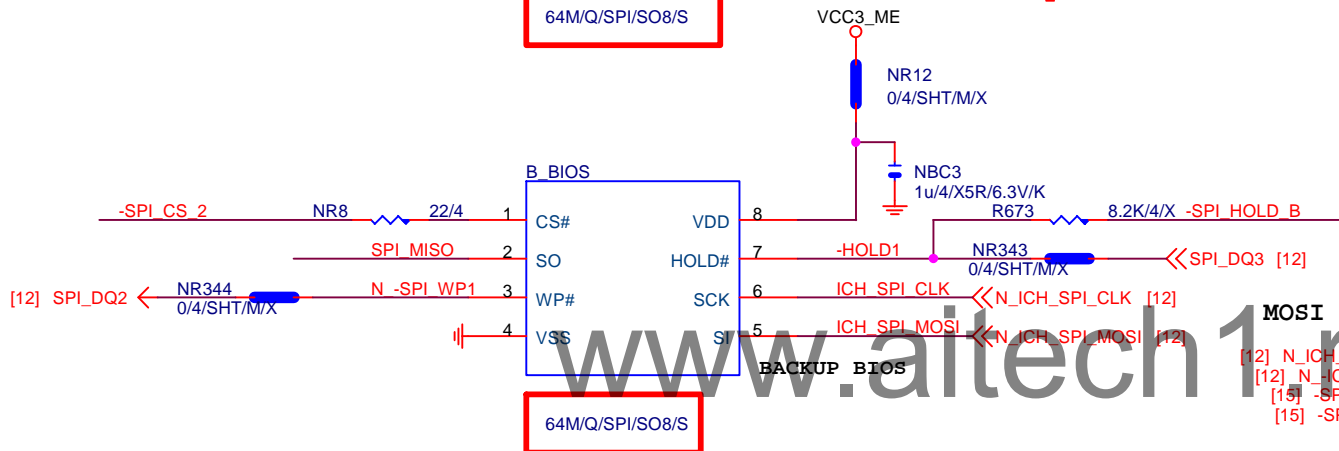
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Custom	GA-H87N	1.1

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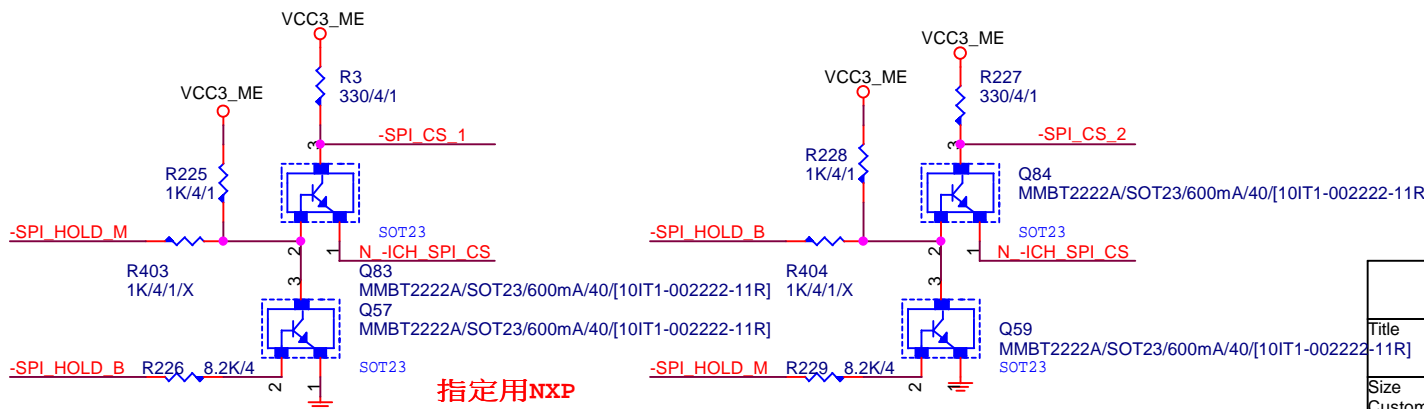
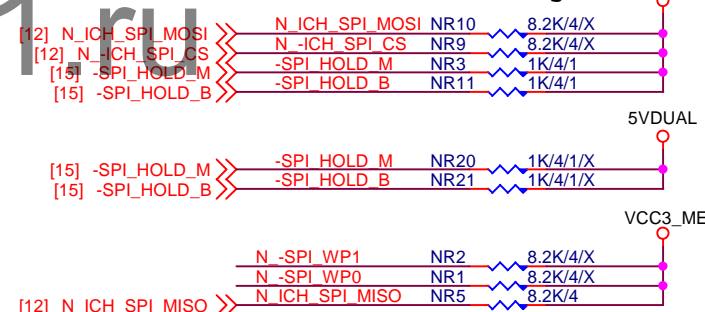


BOOT DEVICE	GNT0	GNT1
LPC	0	0
PCI	0	1
NAND	1	0
SPI	1	1

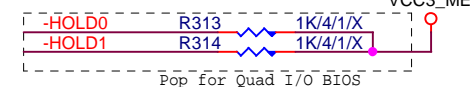
1 means floating
0 means PD 1K



MOSI For DMI RX Termination Voltage



CHECK



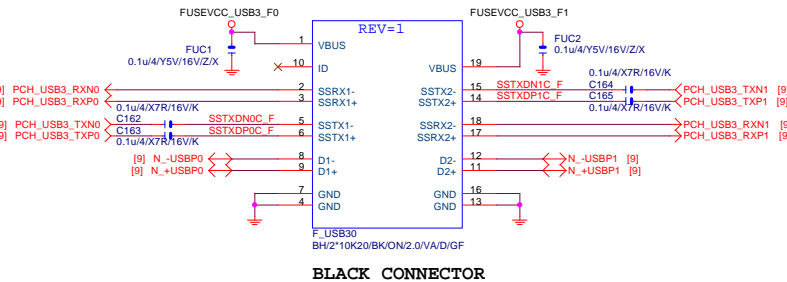
Gigabyte Technology

DUAL BIOS

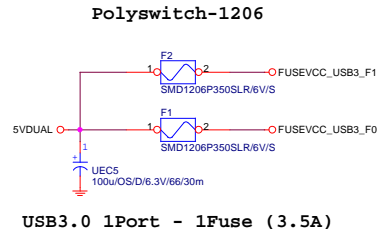
GA-H87N

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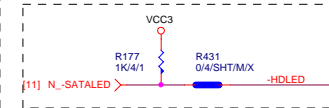
F_USB30



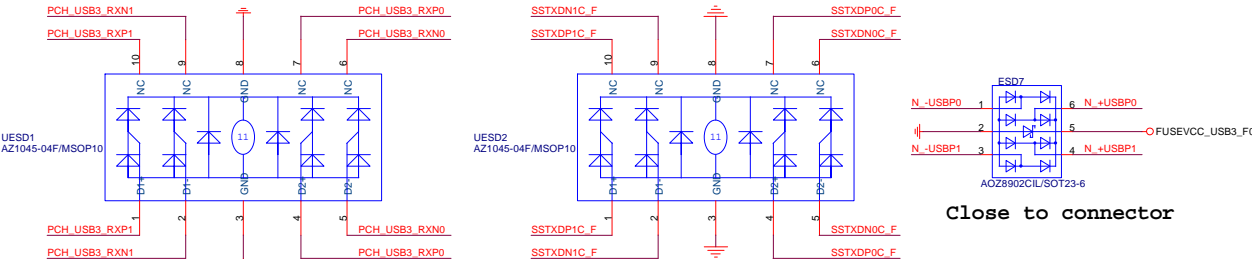
F_USB30 PWR



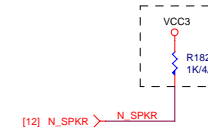
SATA LED



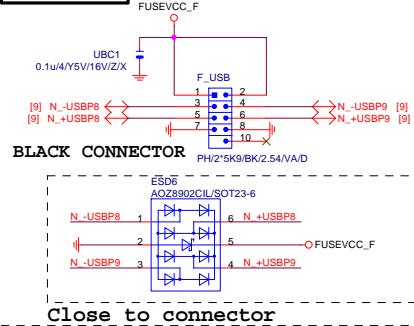
F_USB30 ESD PROTECT



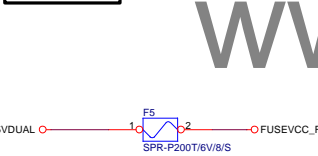
SPKR



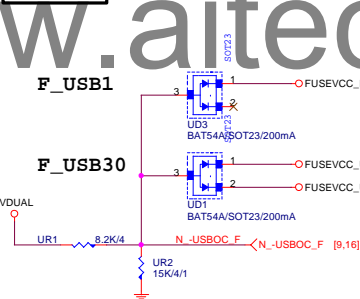
FRONT USB1



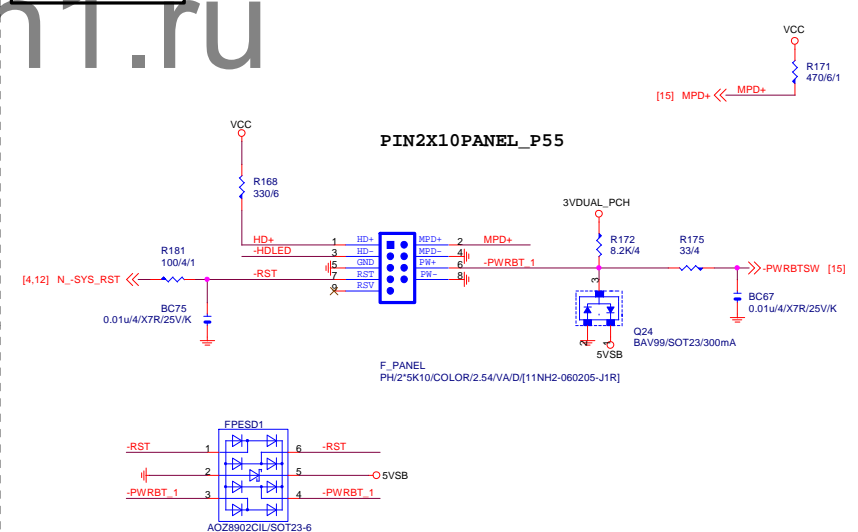
FUSEVCC_F



-USBOC_F



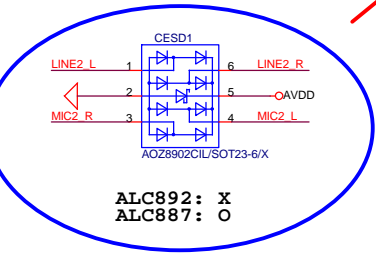
INTEL FRONT PANEL



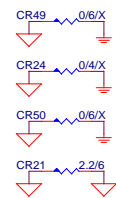
Gigabyte Technology			
Title	FP_F_USB,USB PWR,SPKR,SATA LED		
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CR5/CR8/CR11/CR4/ CR17/CR22/CR45/CR33/ CR47/CR40/CR26/CR37/ CR13/CR11/CR57/CR53	62 ohm	62 ohm	62 ohm	75 ohm	75 ohm
CR51/CD1/CBC7	O	O	X	X	O
CD2/CD3/CQ3/CQ5	X	X	O	O	X
CR1/CR14/CR17/CR22	62 ohm	62 ohm	62 ohm	75 ohm	1K ohm

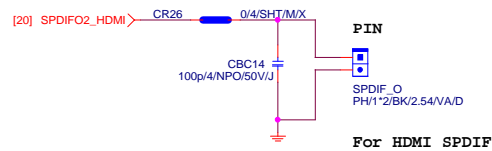


CODEC POWER/EMI PAD

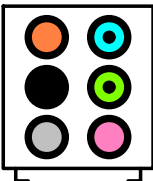


ADD CD2 For ESD PROTECT DIODE

SPDIF_OUT



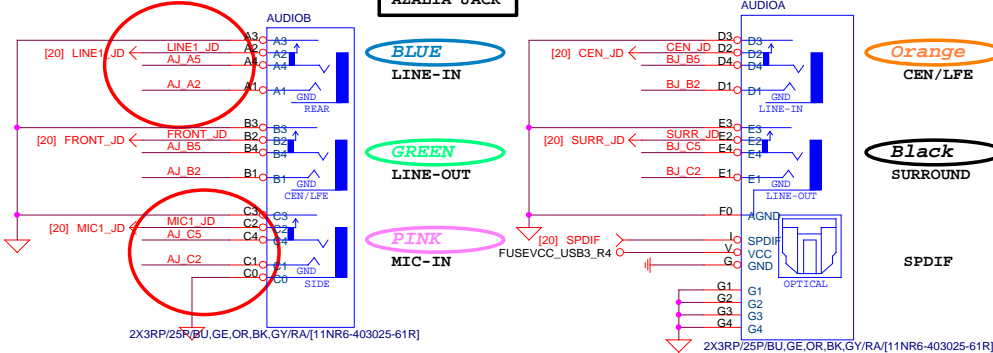
AZALIA JACK



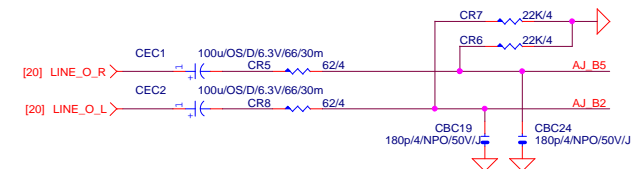
AZALIA JACK

BLUE
LINE-INGREEN
LINE-OUTPINK
MIC-INOrange
CEN/LFEBlack
SURROUND

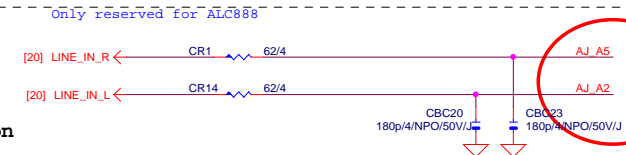
SPDIF



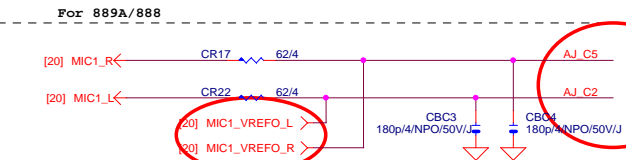
LINE-OUT



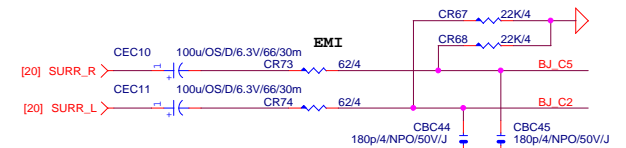
LINE-IN

Verify MIC function
in LINE-in

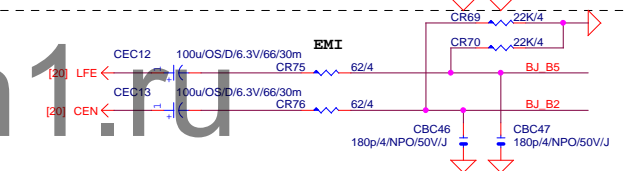
MIC-IN



SURROUND

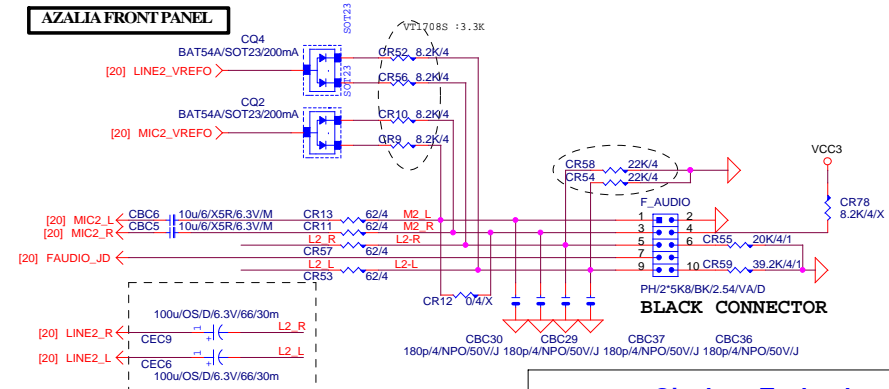


CEN/LFE



SURRBACK

AZALIA FRONT PANEL



Gigabyte Technology

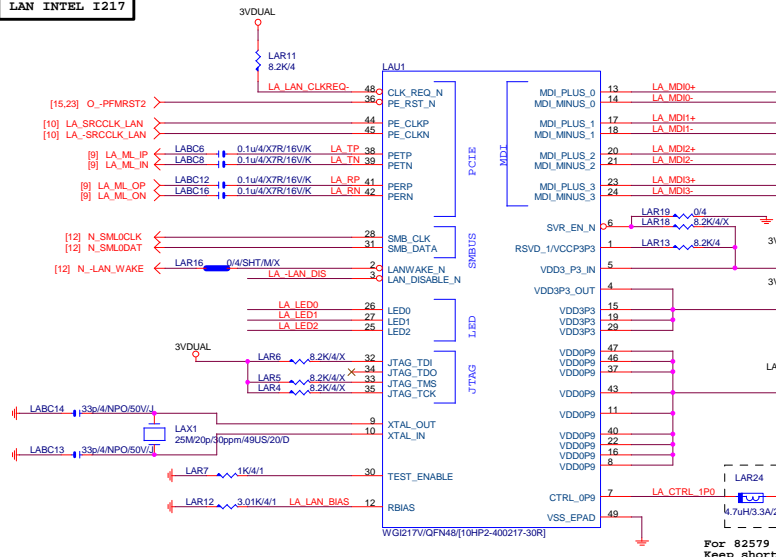
AUDIO JACK

GA-H87N

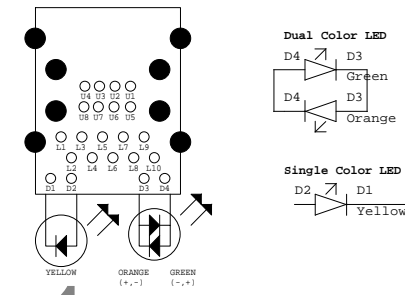
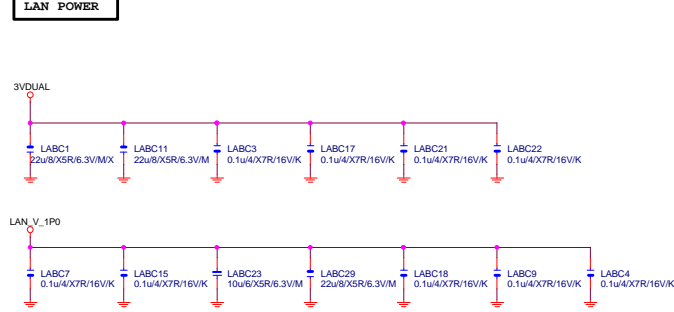
Rev
1.1

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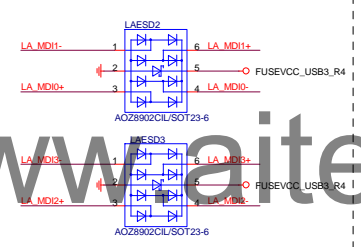
LAN INTEL I217



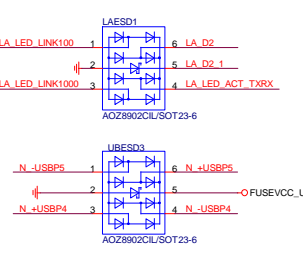
LAN POWER



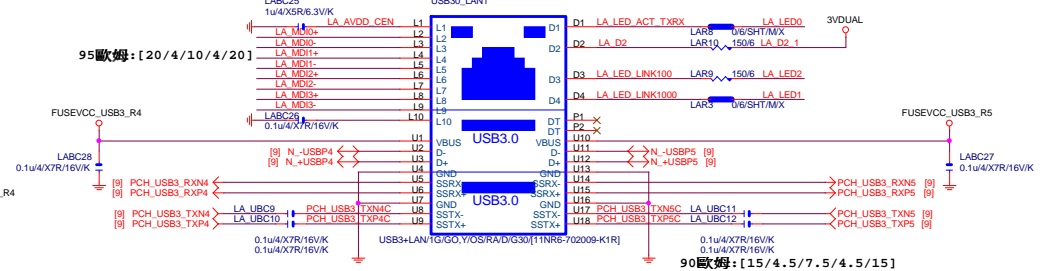
MDI ESD 预留28KV



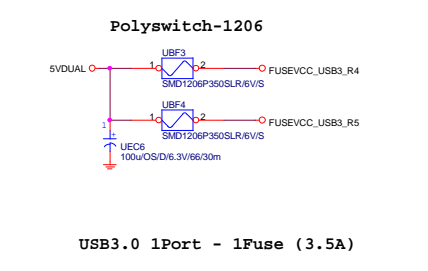
USB30_LAN ESD



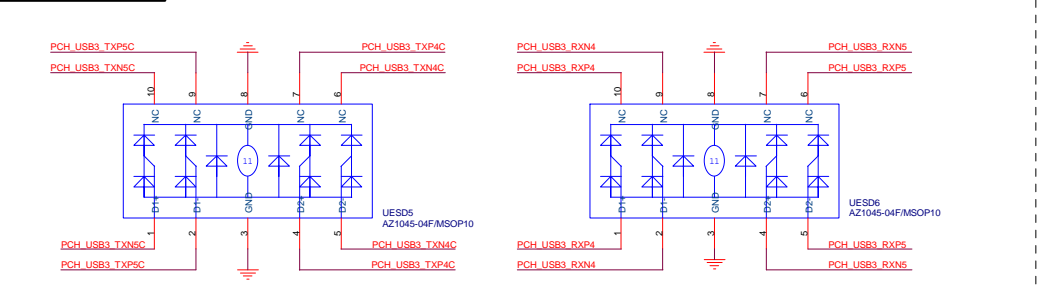
USB30_LAN CONNECTOR



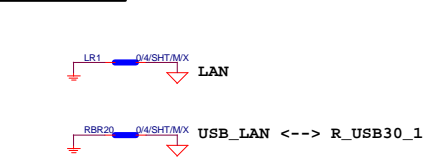
USB X3 POWER



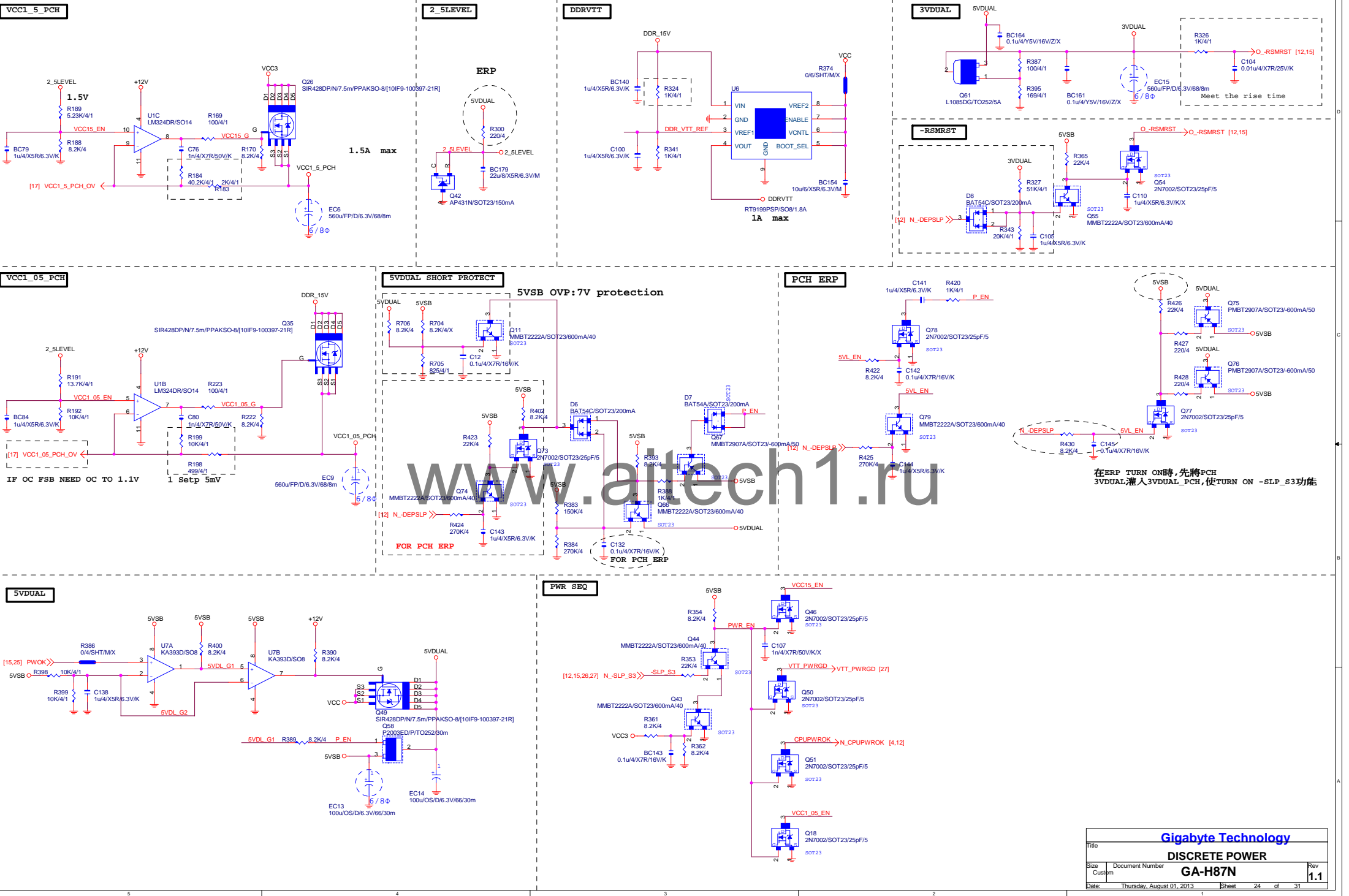
USB30 ESD PROTECT



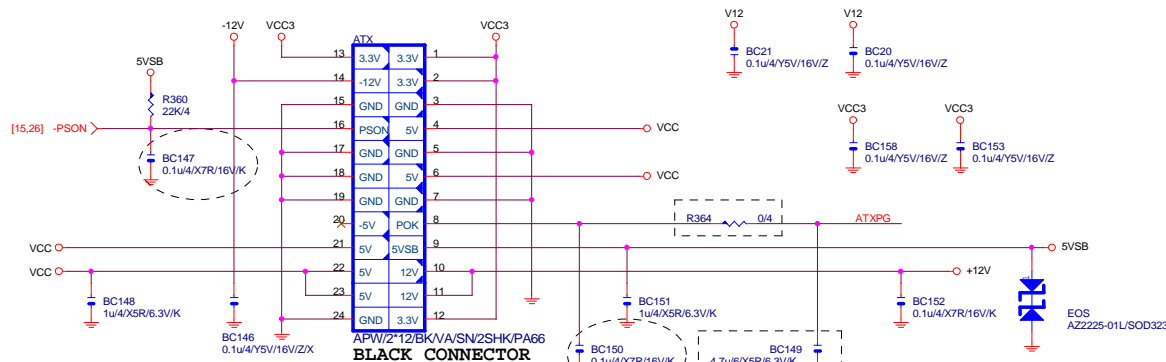
EMI SHORT PAD



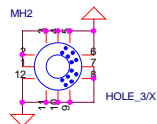
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GA-H87N		
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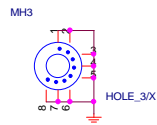
ATXX24 POWER CONNECTOR



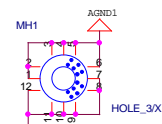
MB LOCATION



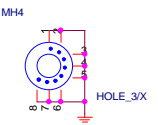
HOLE_4-RH-5MM-1



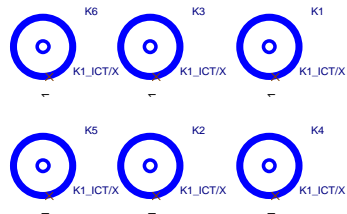
HOLE_4-RH-5MM-5PIN-1



HOLE_4-RH-5MM-1

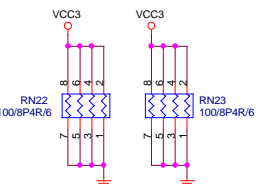


HOLE_4-RH-5MM-5PIN-1

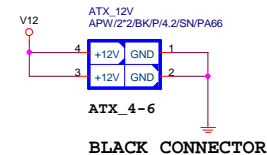


To prevent the 5VSB under loading when boot

FIX PWR MINMUN LOAD



ATXX4 POWER CONNECTOR

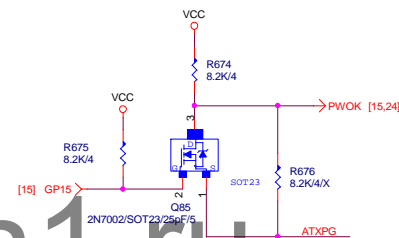


ATX_4-6

BLACK CONNECTOR

PWOK PATCH

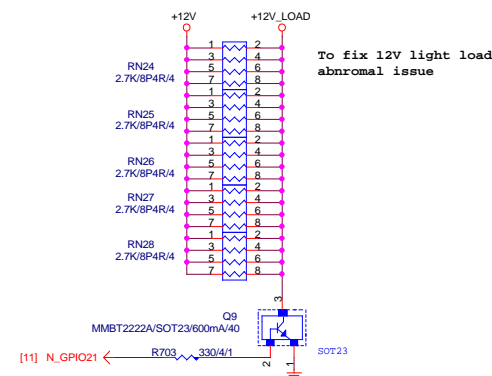
【技術通報R&D技術通報154】



CLK GEN

N/A

【技術通報R&D技術通報153】



Gigabyte Technology

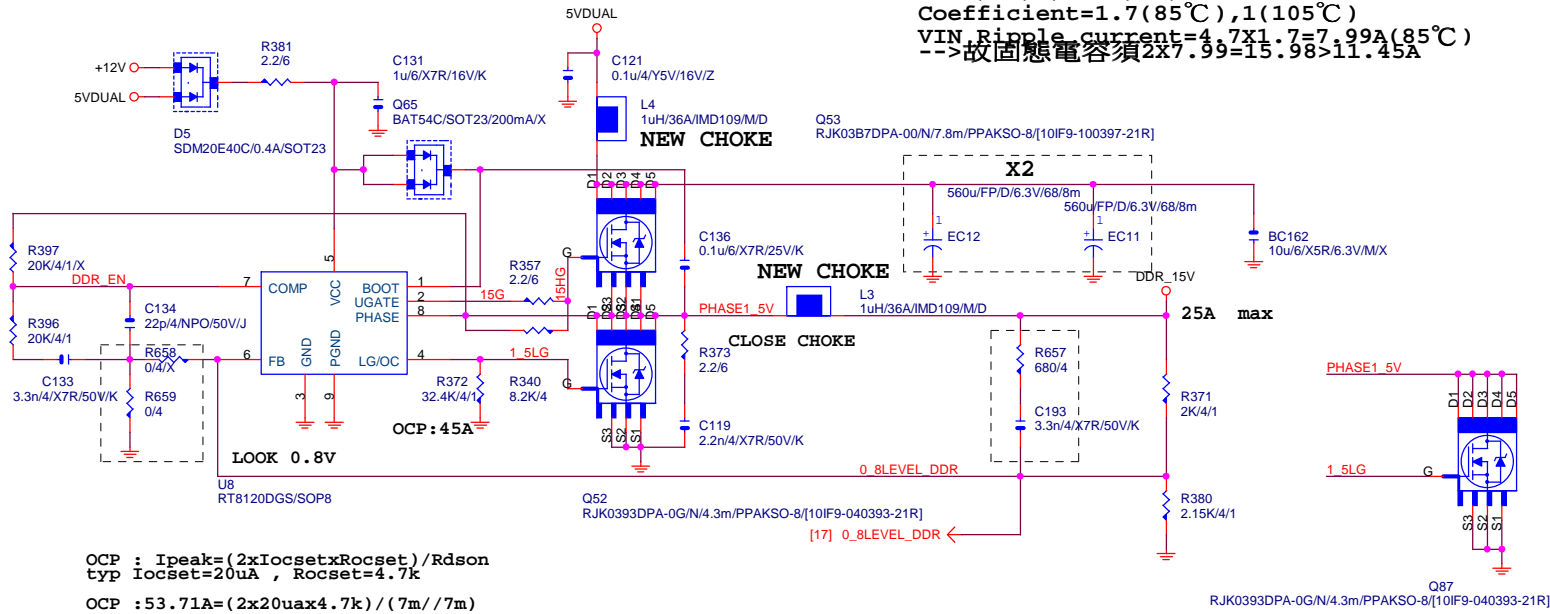
ATX CONNECTOR

GA-H87N

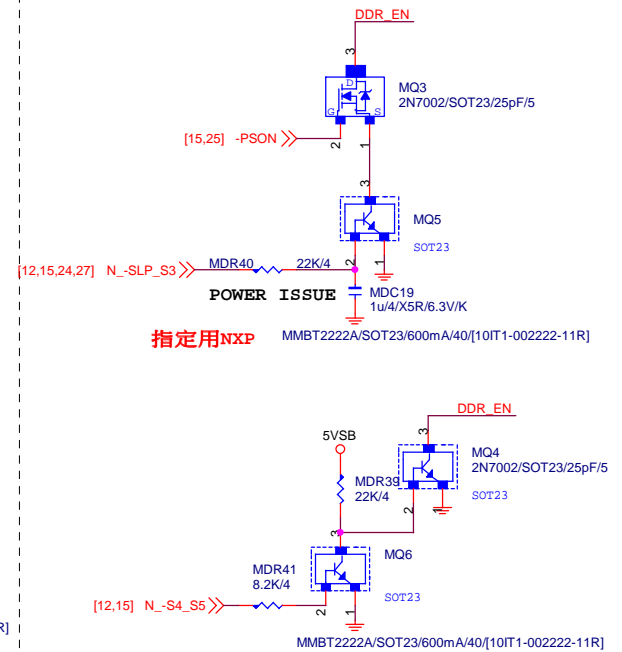
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DDR15V



PWR SEQ

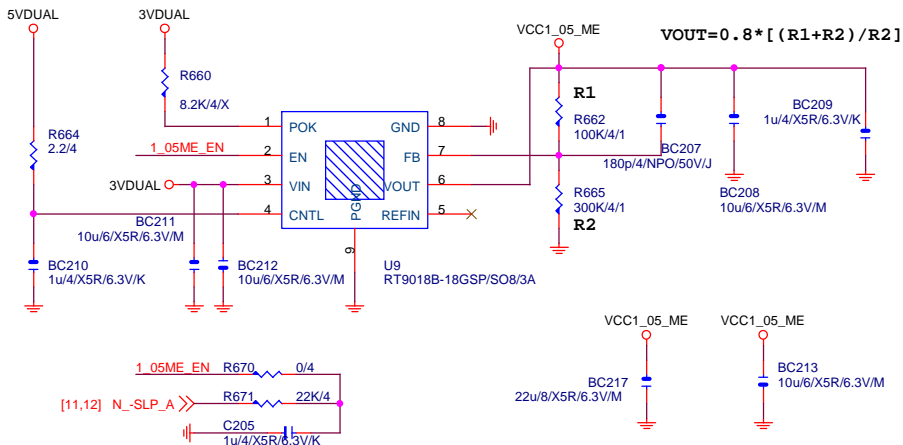


VCC1_05_ME

Z87 N/A

Z87+I217V

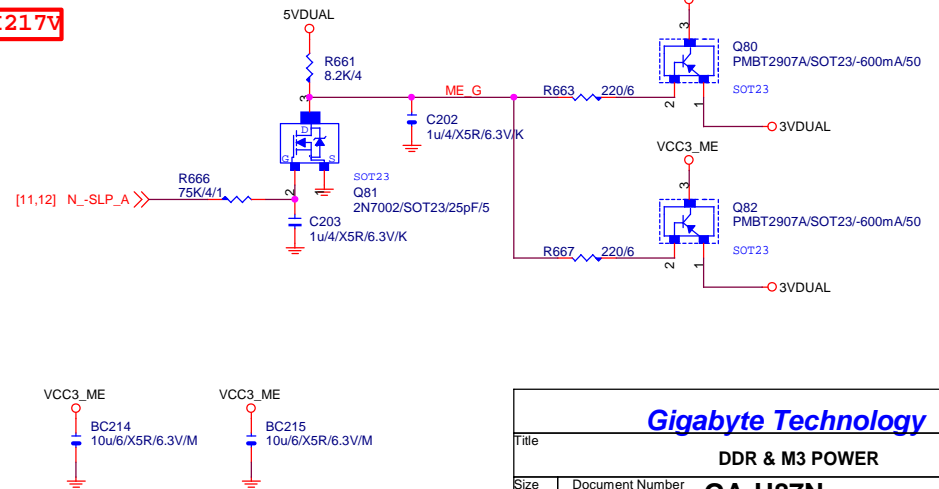
【技術通報R&D技術通報156】
 (RICHTEK), (NUVOTON), (EMC)做共用
 PIN7分壓阻值須做修改為100K以上電阻值



VCC3_ME

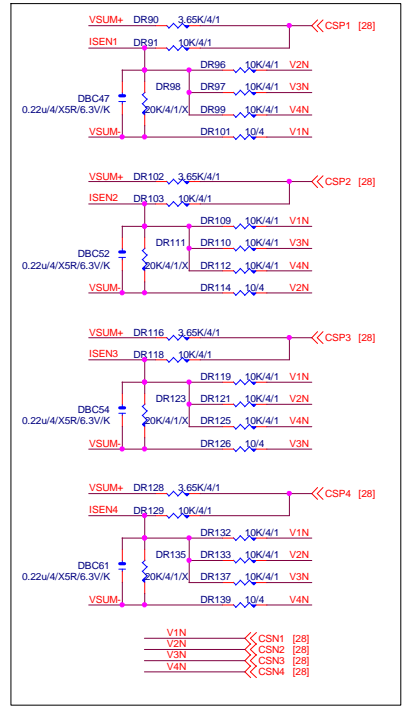
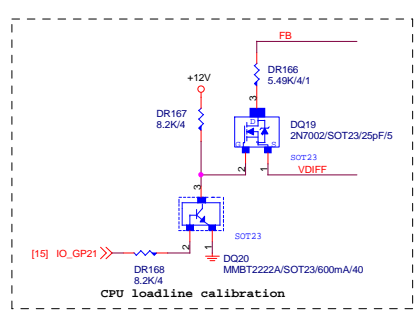
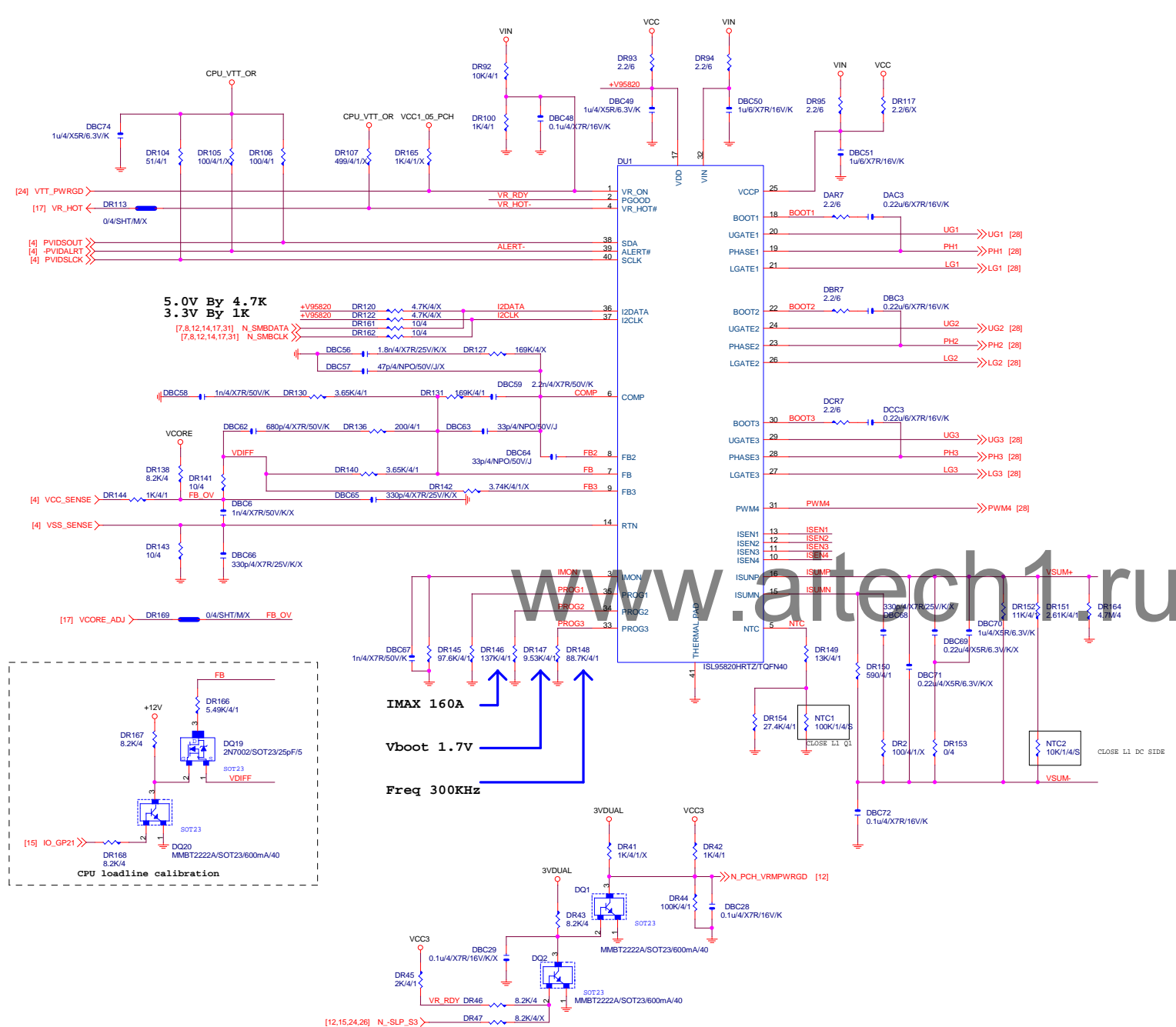
Z87 N/A

Z87+I217V



Gigabyte Technology

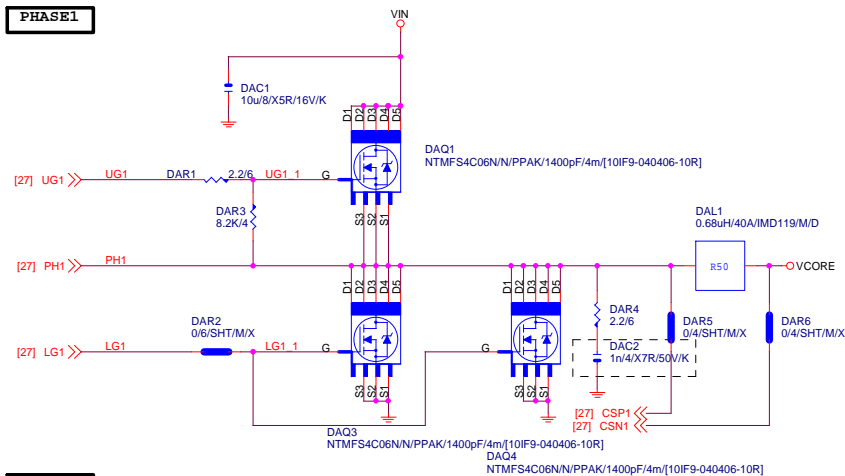
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DDR & M3 POWER		
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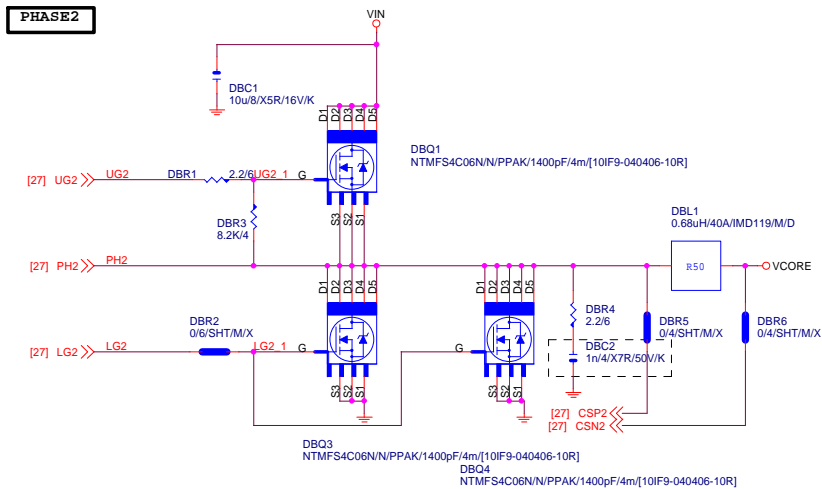
CLOSE PWR

CLOSE L1 DC SIDE

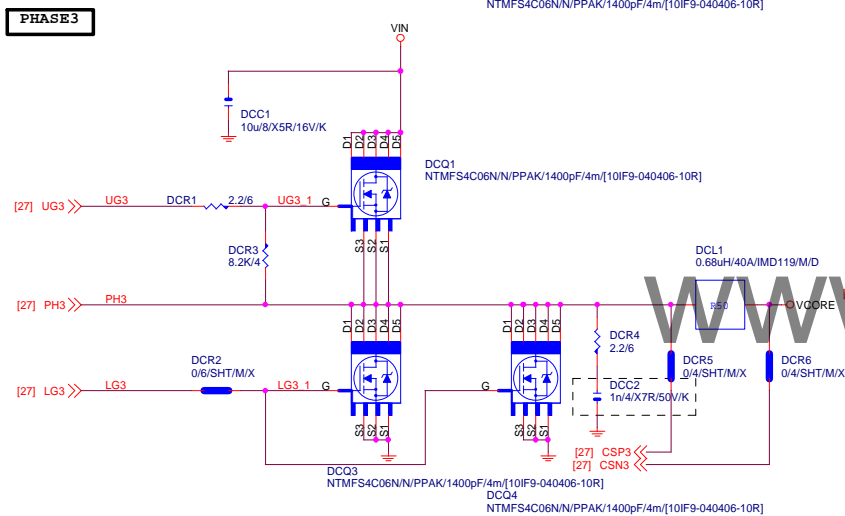
PHASE1



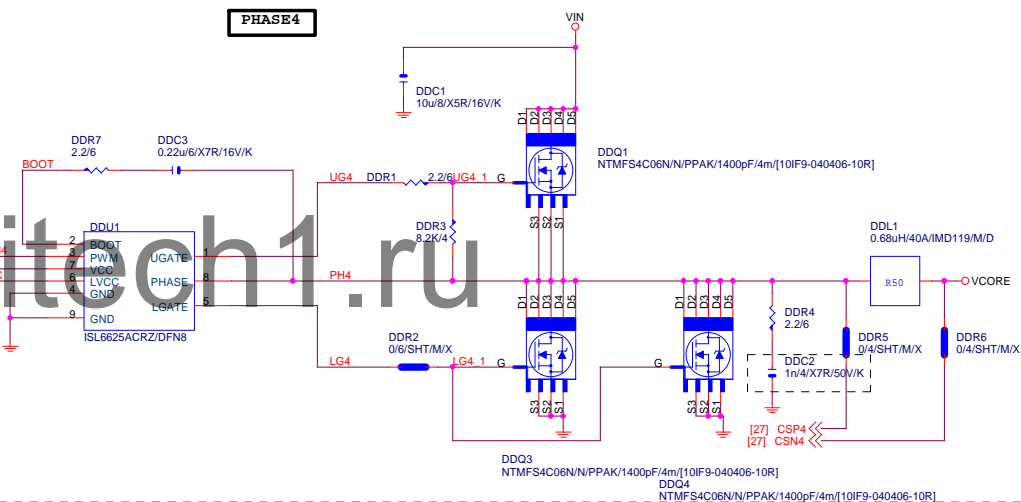
PHASE2



PHASE3

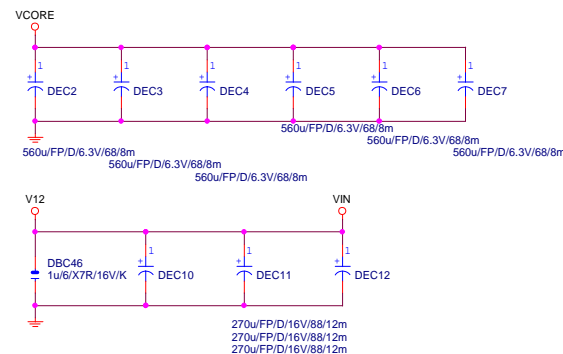


PHASE4



MOS HEATSINK

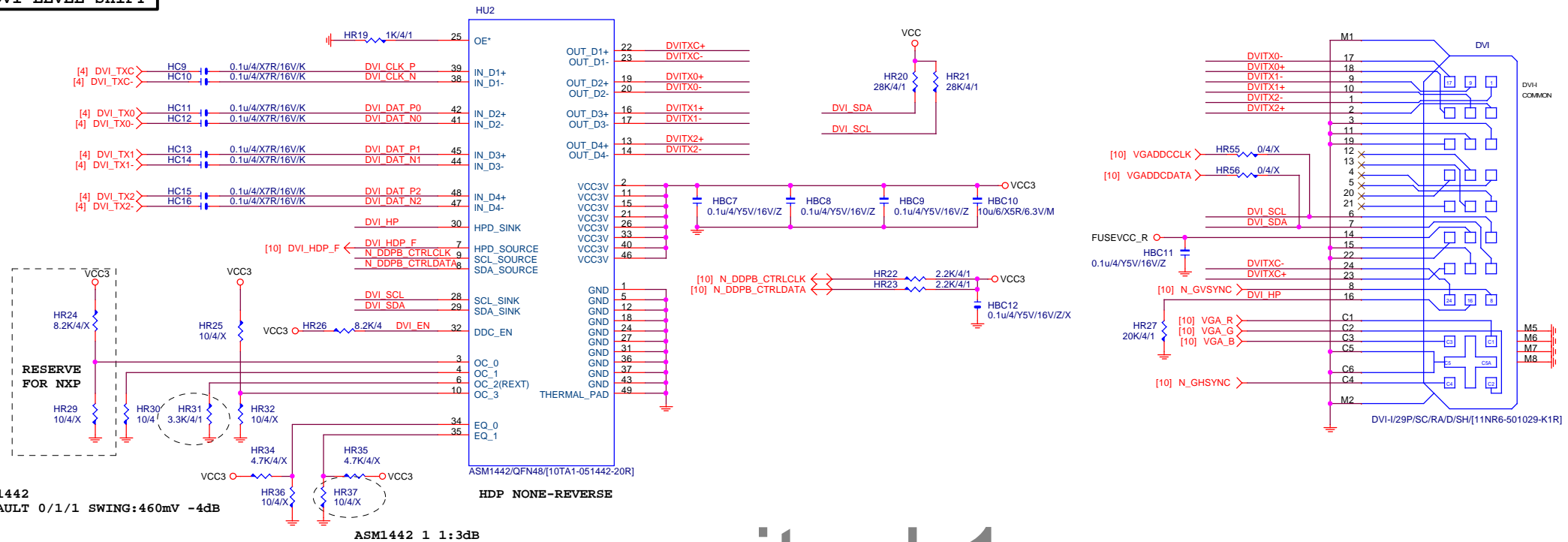
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Gigabyte Technology

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DVI LEVEL SHIFT

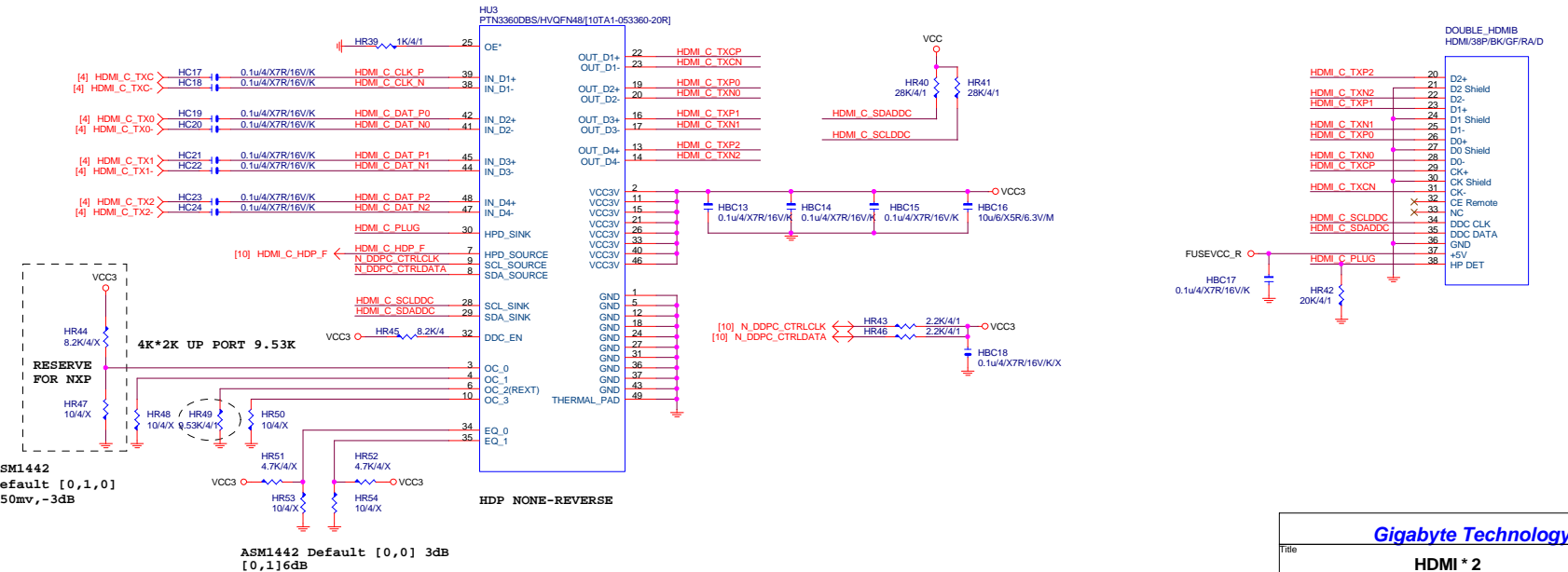


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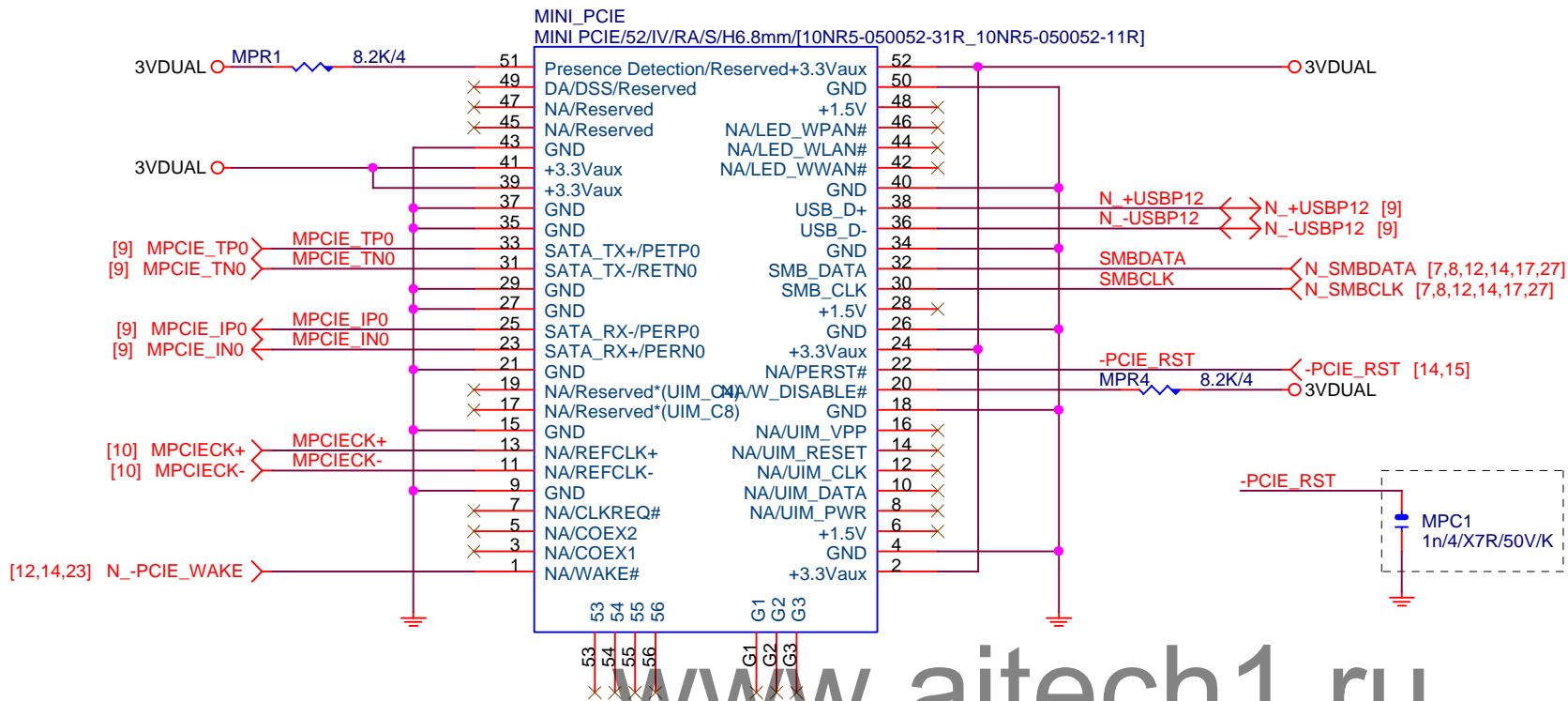
Gigabyte Technology

Title		
DVI		
Size	Document Number	Rev
Custom	GA-H87N	1.1
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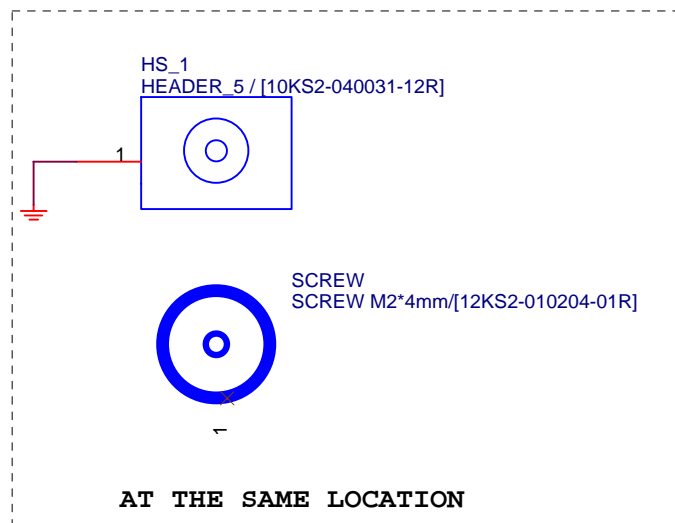
HDMI LEVEL SHIFT



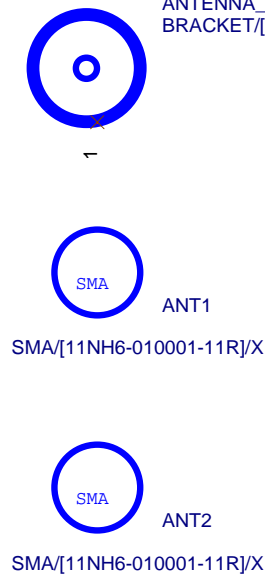
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Size Custom	Document Number						Rev
	GA-H87N						1.1
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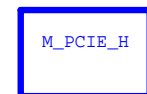
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ANTENNA_BRACKET
BRACKET/[12AC2-000001-01R]/X



H87N REMOVE ANTENNA BRACKET & LINE,
WIFI MODULE.



WIFI_MODULE
WI-FI WITH BT MINI CARD INTEL/[20CB1-022230-00R]/X

Gigabyte Technology		
Title		
mini PCI-E		
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