

Model Name: GA-H81M-HD2

Revision 1.0

SHEET

TITLE

01	COVER SHEET
02	BOM & PCB MODIFY HISTORY
03	BLOCK DIAGRAM
04	CPU_LGA1150-A
05	CPU_LGA1150-B
06	CPU_LGA1150-C
07	DDR III CHANNEL A
08	DDR III CHANNEL B
09	PCH_FDI,DMI,USB,PCIE,NVRAM
10	PCH_DP,CLK BUFFER
11	PCH_HOST,SATA,PCI
12	PCH_GPIO,CTRL,AUDIO
13	PCH_PWR,GND
14	PCI EXPRESS*16 SLOT
15	PCI EXPRESS X1 *2 SLOT
16	ITE 8620 LPC IO
17	COM,KB_MS_USB,USB30_20
18	HWM,FAN CTRL,OV,-PROCHOT
19	DUAL BIOS
20	FP,FUSB,SPK,SATALED
21	Realtek ALC887-VD2
22	REAR AUDIO JACK
23	REALTEK RTL8111F
24	DISCRETE POWER
25	ATX , CLOCK GEN
26	VCORE ISL95812_1
27	VCORE ISL95812_2

SHEET

TITLE

28	RT8120_DDR POWER
29	HDMI/DVI

Gigabyte Technology

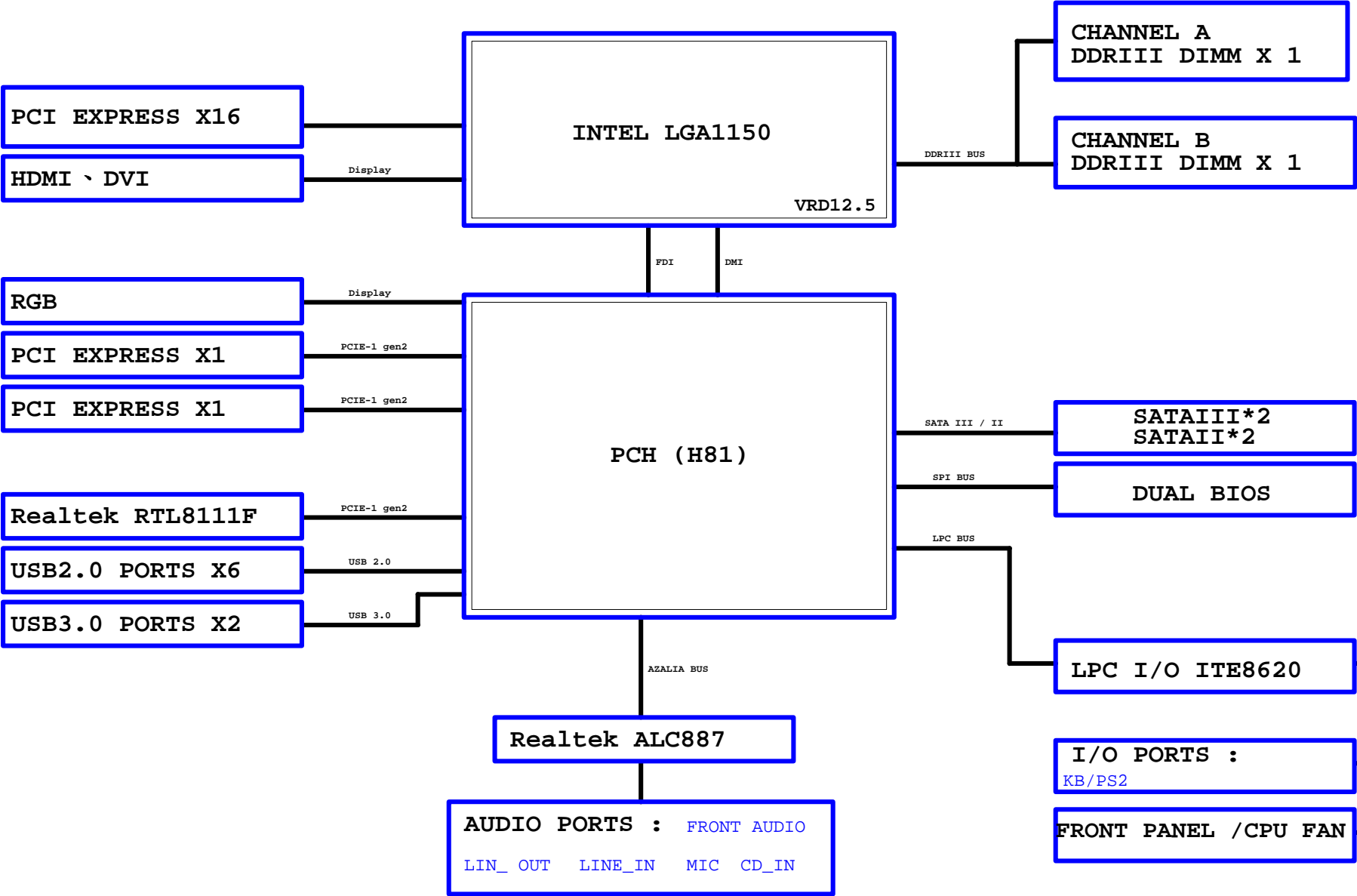
Cover Sheet

Size Custom	Document Number	GA-H81M-HD2	Rev 1.0
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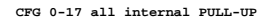
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CD

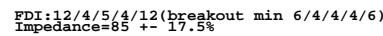
BLOCK DIAGRAM



(E)



(D)

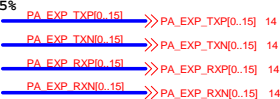


(C)

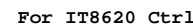
Impedance=80 +- 17.5%



DMI:12/4/4/4/12(break)
Impedance=85 +- 17.5%



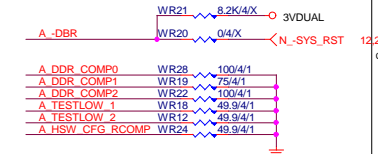
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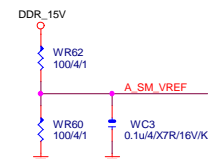
CPU SVID



CPU PU/PD



SM REF



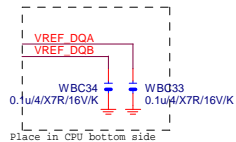
LGA1150 (A)

LGA1150A									
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	MDA8				
MAAA14	AT20	DDR0_MA14	DDR0_D14	AK37	MDA14				
MAAA15	AU21	DDR0_MA15	DDR0_D15	AK40	MDA15				
		DDR0_D16	DDR0_D16	AM40	MDA17				
MODT_A0	AW10	DDR0_ODT0	DDR0_ODT0	AM39	MDA21				
MODT_A1	AY8	DDR0_ODT1	DDR0_ODT1	AP38	MDA18				
	AW9	DDR0_ODT2	DDR0_ODT2	AP39	MDA19				
	AW8	DDR0_ODT3	DDR0_ODT3	AM37	MDA20				
				AM38	MDA16				
				AP37	MDA22				
	AW33	DDR0_ECC0	DDR0_DQ23	AP40	MDA23				
	AW33	DDR0_ECC1	DDR0_DQ24	AV37	MDA25				
	AU31	DDR0_ECC2	DDR0_DQ25	AW37	MDA29				
	AW31	DDR0_ECC3	DDR0_DQ26	AU35	MDA26				
	AU33	DDR0_ECC4	DDR0_DQ27	AV35	MDA27				
	AW33	DDR0_ECC5	DDR0_DQ28	AT37	MDA28				
	AT31	DDR0_ECC6	DDR0_DQ29	AU37	MDA24				
	AW31	DDR0_ECC7	DDR0_DQ30	AT35	MDA30				
			DDR0_DQ31	AW35	MDA31				
			DDR0_DQ32	AY6	MDA33				
			DDR0_DQ33	AU6	MDA37				
			DDR0_DQ34	AV4	MDA34				
			DDR0_DQ35	AU4	MDA35				
			DDR0_DQ36	AW6	MDA32				
			DDR0_DQ37	AW4	MDA38				
			DDR0_DQ38	AY4	MDA39				
			DDR0_DQ39	AR1	MDA41				
			DDR0_DQ40	AR4	MDA45				
			DDR0_DQ41	AN3	MDA42				
			DDR0_DQ42	AN4	MDA43				
			DDR0_DQ43	AR2	MDA44				
			DDR0_DQ44	AR3	MDA40				
			DDR0_DQ45	AN2	MDA46				
			DDR0_DQ46	AN1	MDA47				
			DDR0_DQ47	AL1	MDA49				
			DDR0_DQ48	AL4	MDA53				
			DDR0_DQ49	AL4	MDA50				
			DDR0_DQ50	AJ4	MDA51				
			DDR0_DQ51	AL2	MDA52				
			DDR0_DQ52	AL3	MDA48				
			DDR0_DQ53	AJ2	MDA54				
			DDR0_DQ54	AJ1	MDA55				
			DDR0_DQ55	AG1	MDA57				
			DDR0_DQ56	AG4	MDA61				
			DDR0_DQ57	AE3	MDA58				
			DDR0_DQ58	E4	MDA59				
			DDR0_DQ59	AG2	MDA60				
			DDR0_DQ60	AG3	MDA56				
			DDR0_DQ61	AE2	MDA62				
			DDR0_DQ62	AE1	MDA63				
			DDR0_DQ63	AE39	DQSA0				
			DDR0_DQ64	AJ39	DQSA1				
			DDR0_DQ65	AN39	DQSA2				
			DDR0_DQ66	AV36	DQSA3				
			DDR0_DQ67	AV5	DQSA4				
			DDR0_DQ68	AP3	DQSA5				
			DDR0_DQ69	AK3	DQSA6				
			DDR0_DQ70	AF3	DQSA7				
			DDR0_DQ71	AV32					
			DDR0_DQ72	AE38	DQSA0				
			DDR0_DQ73	AJ38	DQSA1				
			DDR0_DQ74	AN38	DQSA2				
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HASWELL[10SC1-F01150-11R_10SC1-F01150-12R]

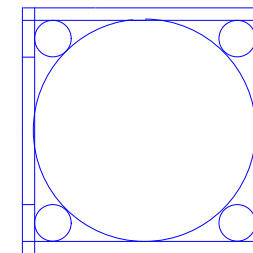
LGA1150 (B)

LGA1150B									
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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	AE18	DDR1_MA10	AK31	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					
		DDR1_ODT0	AP34	MD817					
MODT_B0	AM17	DDR1_ODT1	AP34	MD821					
MODT_B1	AL16	DDR1_ODT2	AK31	MD819					
	AM16	DDR1_ODT3	AP31	MD823					
	AK15		AP35	MD820					
			AP35	MD816					
			AK32	MD818					
			AP32	MD822					
			AM29	MD825					
			AP28	MD828					
			AR29	MD827					
			AR28	MD830					
			AL28	MD824					
			AL28	MD829					
			AP29	MD826					
			AP28	MD831					
			AR12	MD832					
			AP12	MD833					
			AL13	MD834					
			AL12	MD835					
			AR13	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					
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			AL7	MD855					
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			AM7	MD851					
			AH6	MD861					
			AH7	MD860					
			AE6	MD859					
			AJ6	MD863					
			AJ7	MD857					
			AF6	MD858					
			AF7	MD862					
			AF36	DQSB0					
			AL33	DQSB1					
			AP33	DQSB2					
			AN28	DQSB3					
			AN12	DQSB4					
			AP8	DQSB5					
			AL8	DQSB6					
			AG7	DQSB7					
			AN25						
			AF34	DQSB0					
			AK33	DQSB1					
			AN33	DQSB2					
			AN29	DQSB3					
			AN13	DQSB4					
			AR8	DQSB5					
			AM8	DQSB6					
			AG6	DQSB7					
			AN26						



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

LGA1150 (CR)

CR
CPU RETAINION/X

LGA1150



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

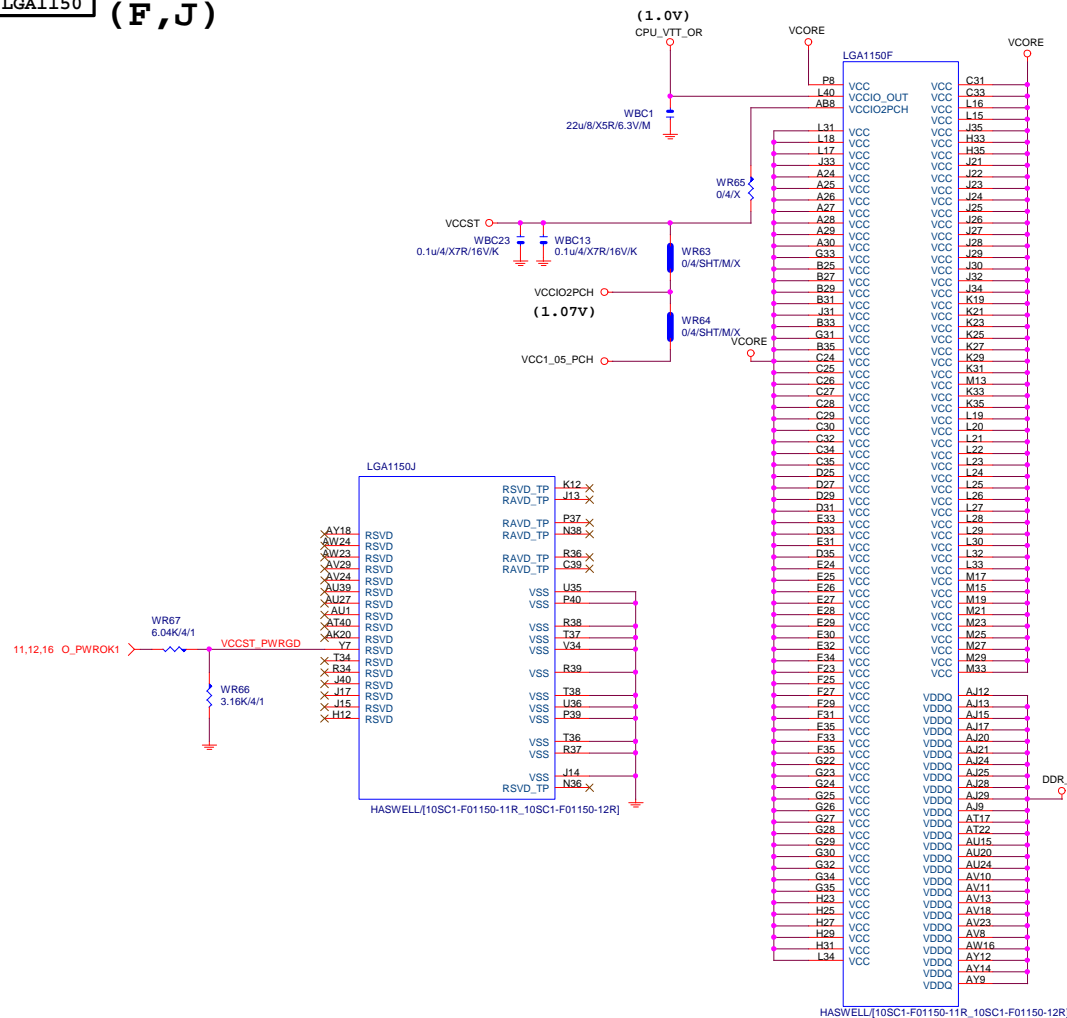
DDR BUS

7	MODT_A[0..1]	MODT_A10..1
8	MODT_B[0..1]	MODT_B10..1
7	MDA[0..63]	MDA10..63
8	MD8[0..63]	MD810..63
7	DQSA[0..7]	DQSA10..7
7	DQSA[0..7]	DQSA10..7
7	MAAA[0..15]	MAAA10..15
8	MAAB[0..15]	MAAB10..15
8	DQSB[0..7]	DQSB10..7
8	DQSB[0..7]	DQSB10..7

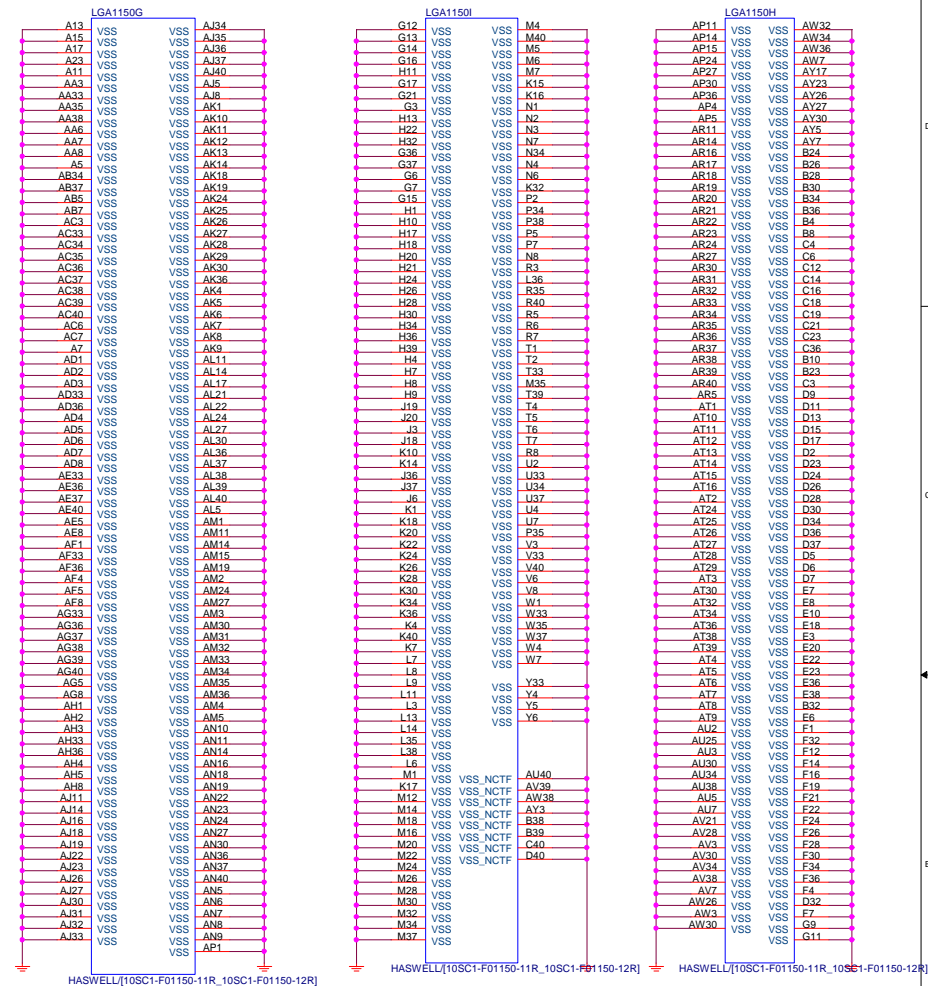
Gigabyte Technology

CPU LGA1150-B			
GA-H81M-HD2			
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Custom			
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LGA1150 (F,J)

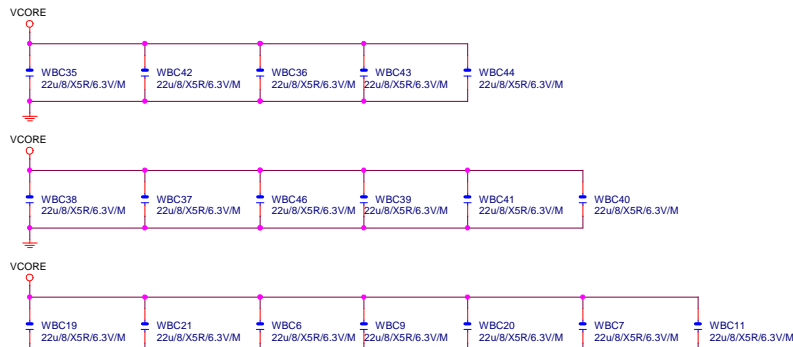


LGA1155 (G,H,I)



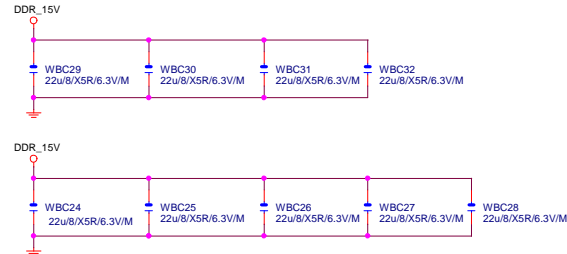
VCore CAP

(x18)



DDR CAP

(x9)



Gigabyte Technology

Title	CPU LGA1150-C
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Size	Document Number	GA-H81M-HD2	Rev
Custom			1

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1.0

(A)

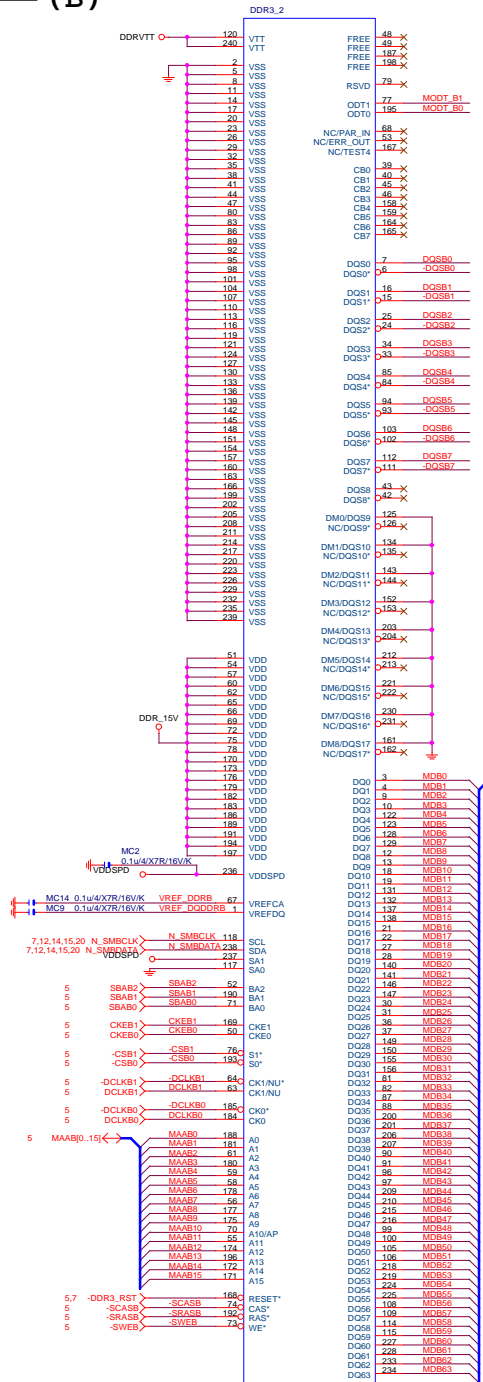


DQSA[0..7] ↔ DQSA[0..7] 5



DDR3

(B)




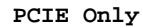
DMI:12/4/4/4/12(breakout min 8/4/4/4/8)
Impedance=85 +- 17.5%

PCHB

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



VCC1 5 PCH 

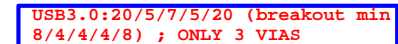


放靠近 Device & PCI-E Slot

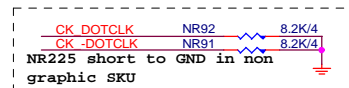
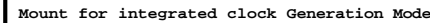
Impedance=80 +- 17.5%

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

PCH.J



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



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LOW COST ICH7 HEATSINK

SB_HEATSIN



GRAY HS

PCH_HS
PCH_HS/[12SP2-030005-43R_12SP2-030005-41R_12SP2-030005-42R_

[REDACTED]

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

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

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

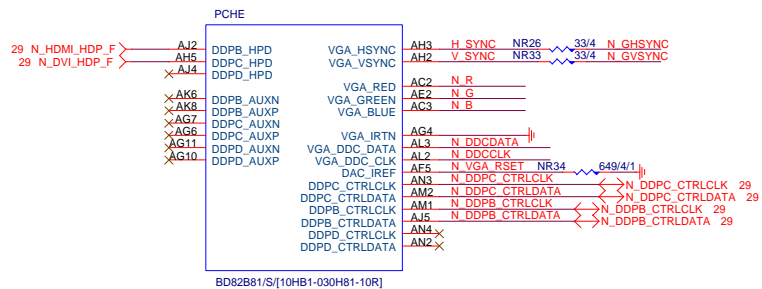
Gigabyte Technology

Title	PCH FDI,DMI,USB ,PCIE,NVRAM
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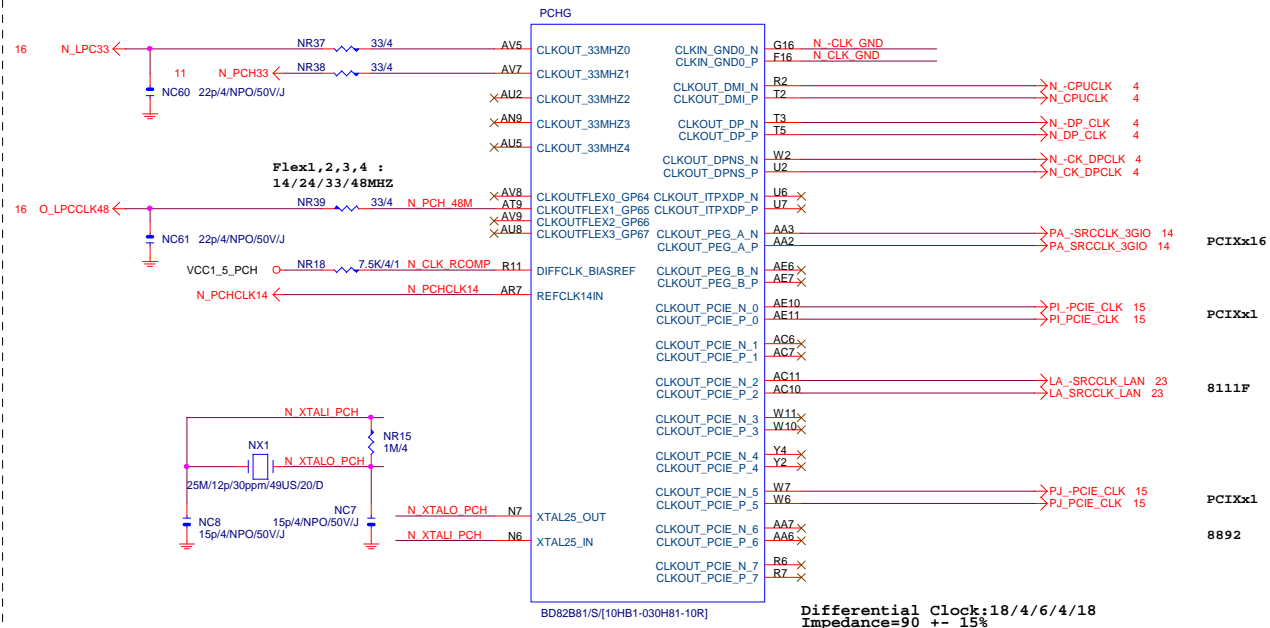
Size	Document Number	Rev
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PCH (E)



PCH (G)



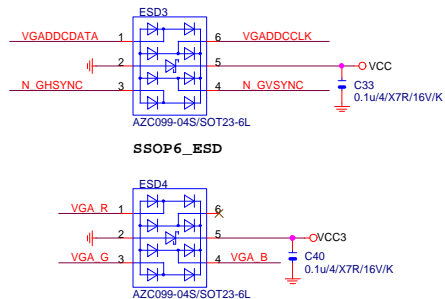
PCH CLK PD



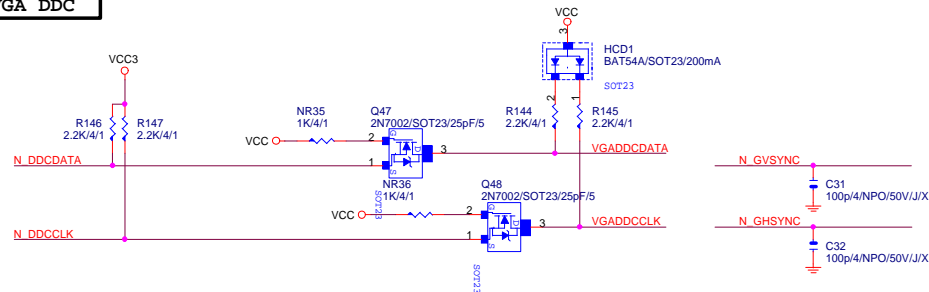
Mount for integrated clock Generation
Mode



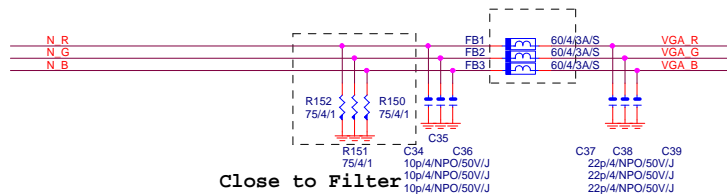
VGA ESD



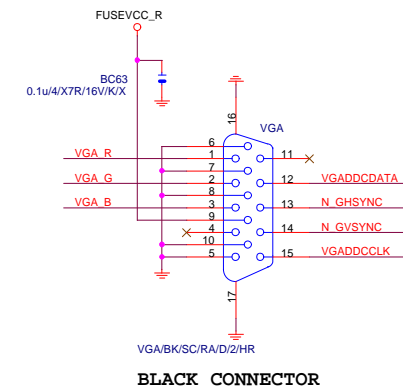
VGA DDC



VGA DDC



VGA CONNECTOR



BLACK CONNECTOR

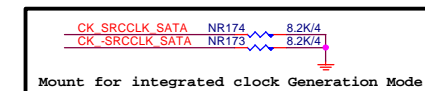
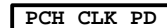
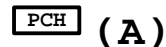
Gigabyte Technology

PCH DISPLAY ,CLK BUFFER

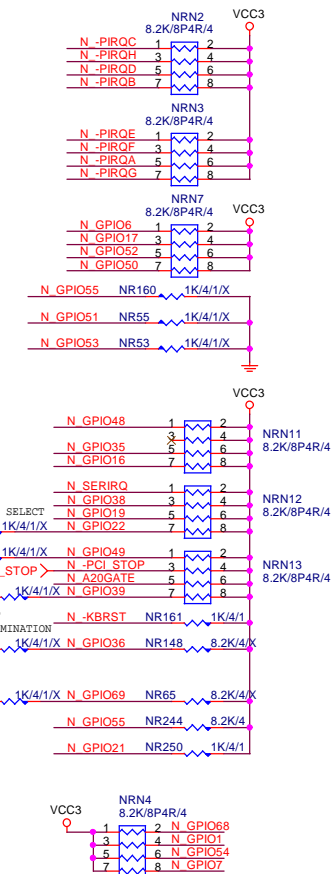
GA-H81M-HD2

Title			
PCH DISPLAY ,CLK BUFFER			
Size	Document Number		Rev
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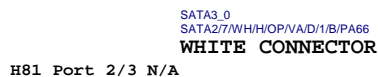
SATA3 : 20/7.5/4.5/7.5/20 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%
SATA2 : 15/7.5/4.5/7.5/15 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%



PCH	PU/PD
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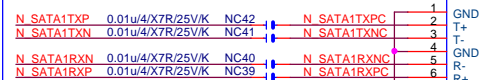
N_SATA0TXP	0.01uA/4X7R/25V/K	NC44	N_SATA0TXPC	1	GND
N_SATA0TXN	0.01uA/4X7R/25V/K	NC43	N_SATA0TXNC	2	T+
				3	T-
N_SATA0RXN	0.01uA/4X7R/25V/K	NC38	N_SATA0RXNC	4	GND
N_SATA0RXP	0.01uA/4X7R/25V/K	NC37	N_SATA0RXP	5	R+
				6	R-



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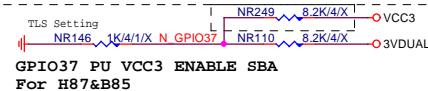


BLACK CONNECTOR

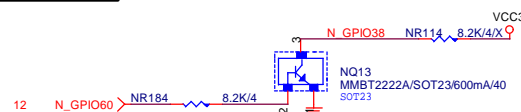


SATA3_1
SATA2/7/WH/H/OP/VA/D/1/B/PA66
WHITE CONNECTOR

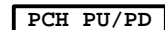
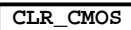
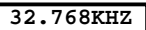
ME PWROK



GPI038 Ctrl

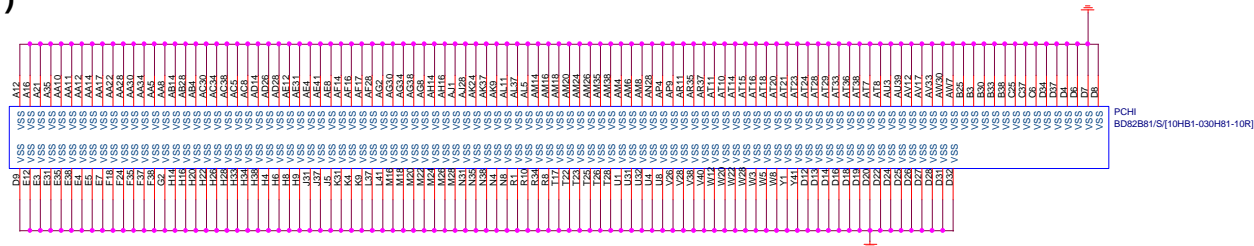


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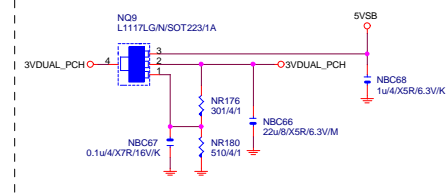


Title			
PCH GPIO , CTRL , AUDIO			
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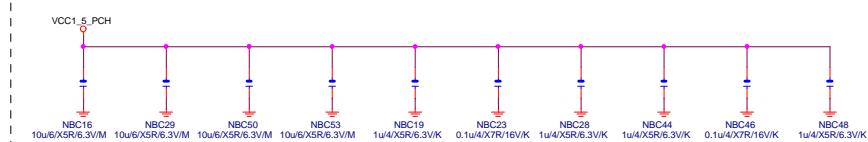
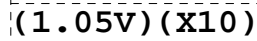
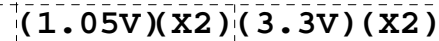
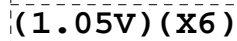
PCH (I)



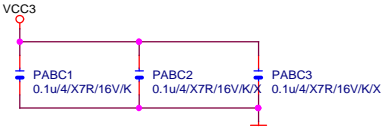
SHT PWR



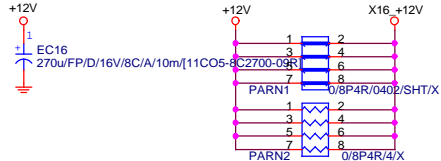
(3.3V) (X6)



PCIEX16 CAP



PCIEX16 PROTECT SHT

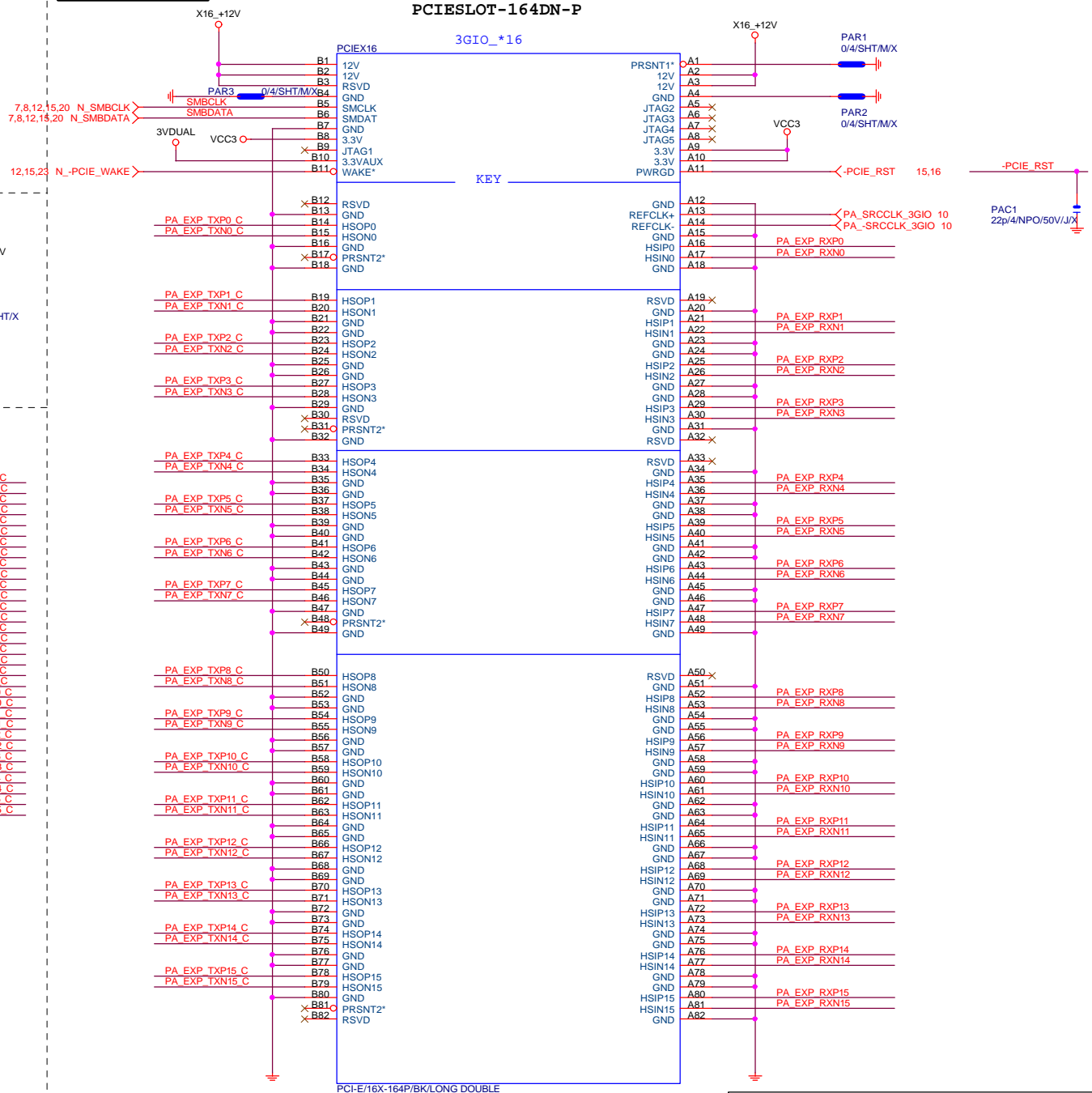


PCIEX16 AC CAP

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 RXIP0.[15] >>> PA_EXP_RXIP[0..15] 4
 PA EXP RXN0.[15] >>> PA_EXP_RXN[0..15] 4
 PA EXP TXIP0.[15] >>> PA_EXP_TXIP[0..15] 4
 PA EXP TXN0.[15] >>> PA_EXP_TXN[0..15] 4

PCIEX16 SLOT



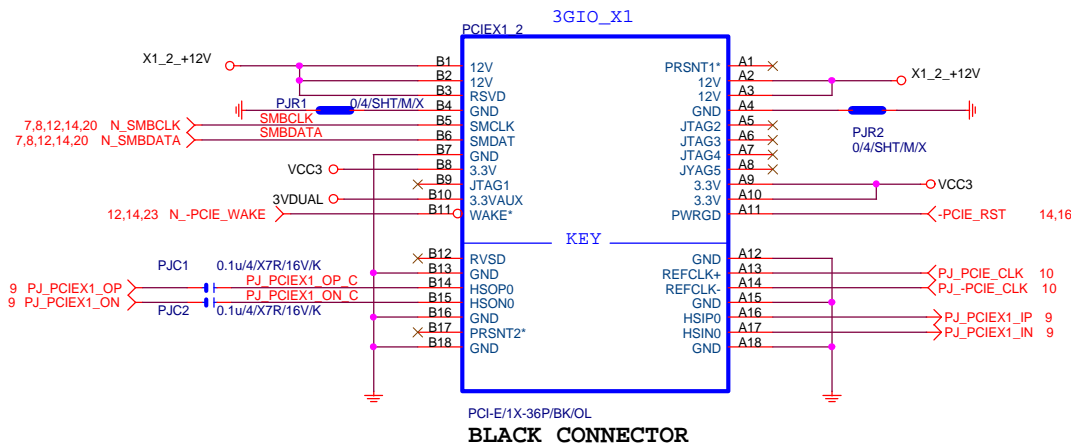
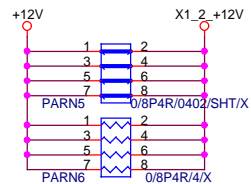
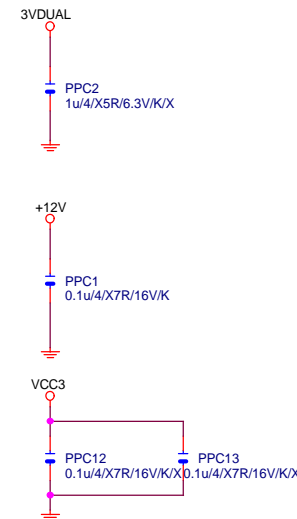
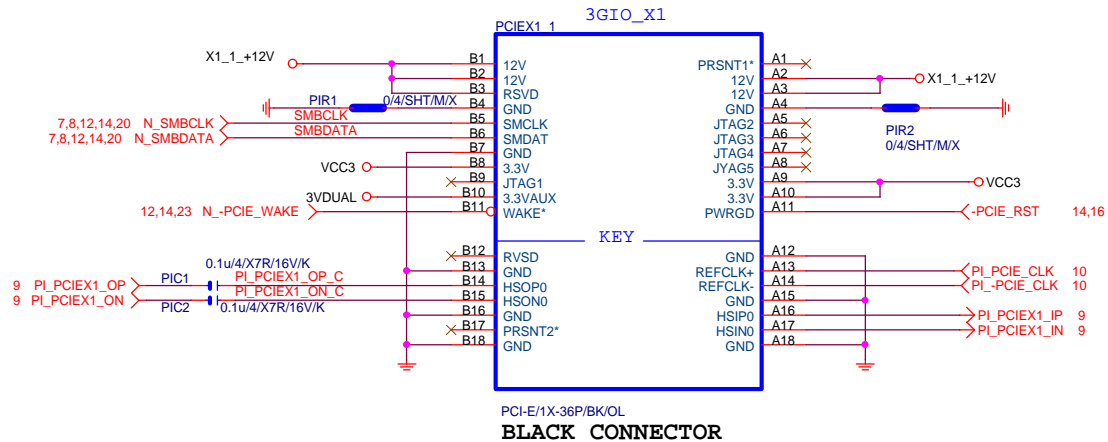
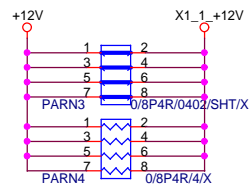
BLACK CONNECTOR

Gigabyte Technology

Title		
PCI EXPRESS * 16		
Size	Document Number	Rev
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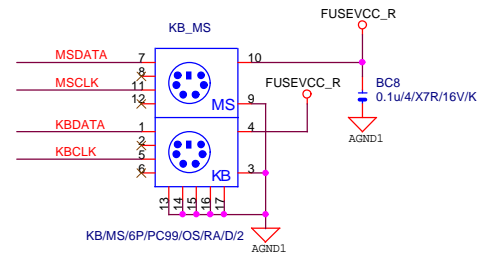
PCIEX1 SLOT

PCIEX1 PROTECT SHT

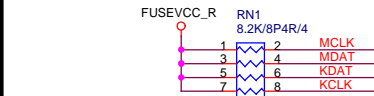


Gigabyte Technology			
PCI EXPRESS X 1 PORT			
Title	Document Number	Rev	
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KB/MS

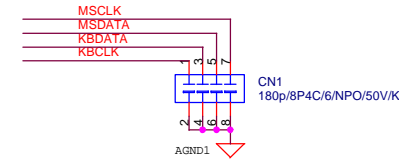
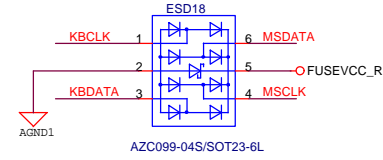


For EMI



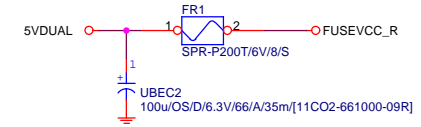
KB_MS ESD

H61M-DS2 R0.2



USB2.0 PWR

FUSE-0805

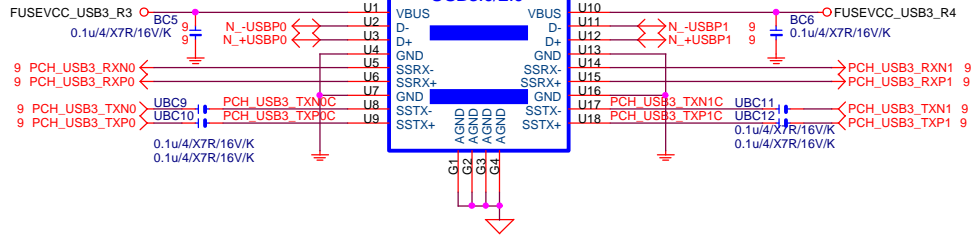


Close to connector

USB30_20

R_USB30
USB/18P/BU/OS/RA/D/2/1U/5B

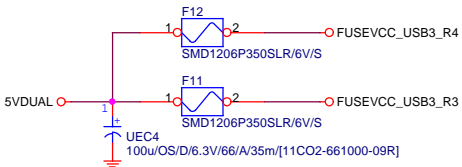
USB3.0/2.0



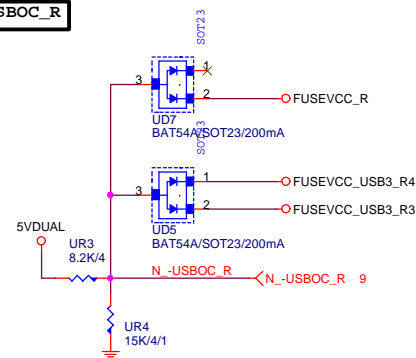
USB30_20 PWR

-USBOC_R

Polyswitch-1206

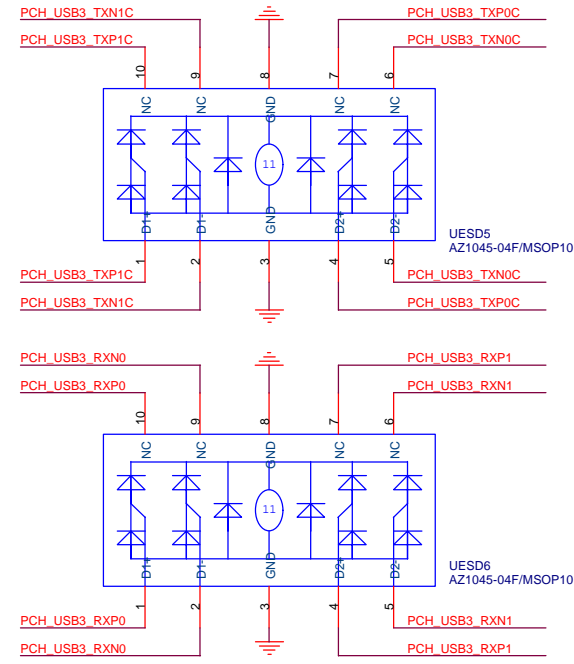


USB3.0 1Port - 1Fuse (3.5A)

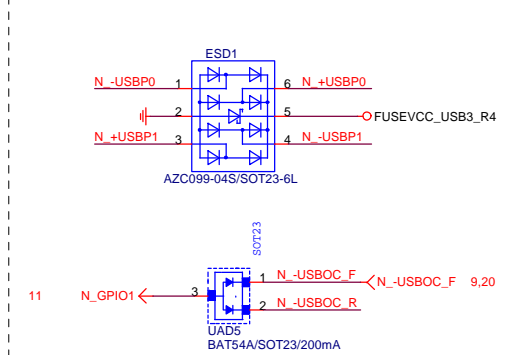


USB30_20 ESD PROTECT

USB3.0 ESD



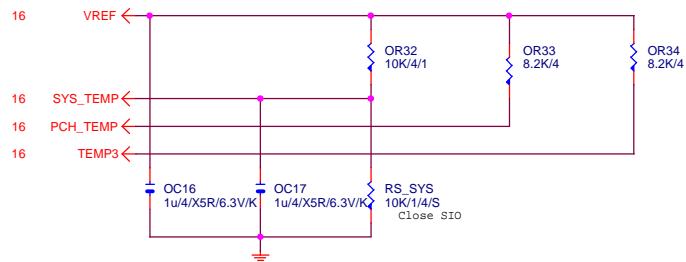
USB POWER PROTECT



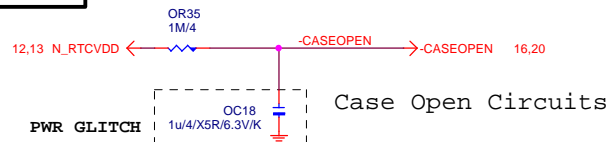
Gigabyte Technology

Title				COM,-RI,KB_USB,USB_ESATA,-PROCHOT	
Size	Document Number	GA-H81M-HD2			Rev
Custom					1.0
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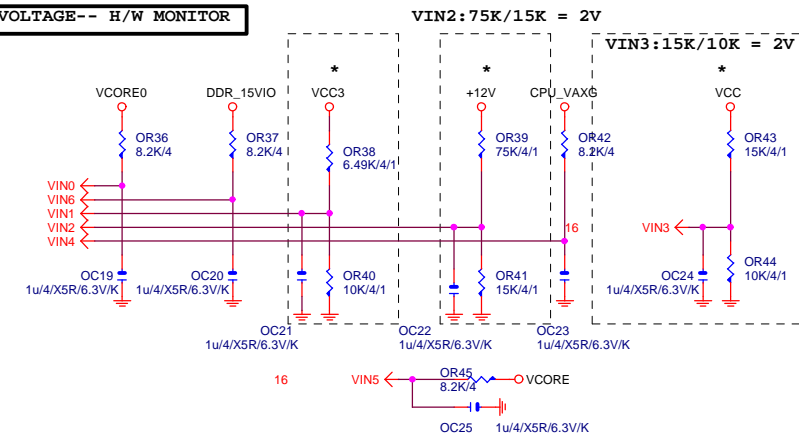
TEMP H/W MONITOR



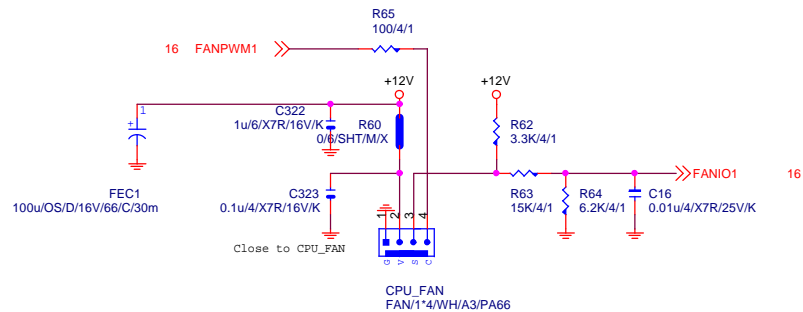
CASE OPEN



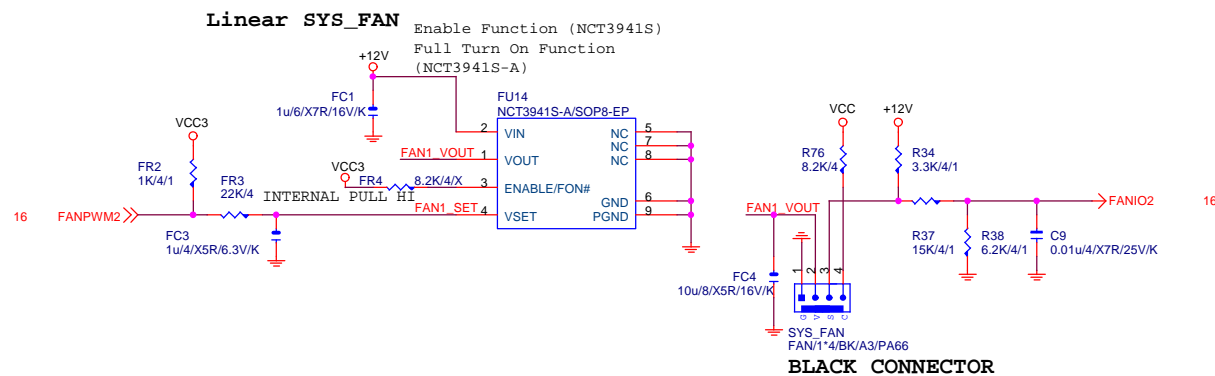
VOLTAGE-- H/W MONITOR



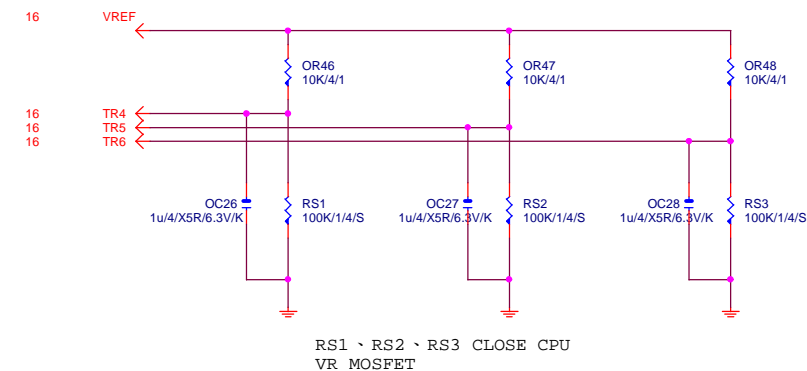
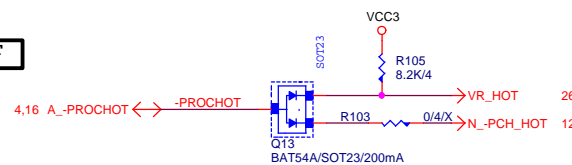
CPU SMART FAN



SYS SMART FAN

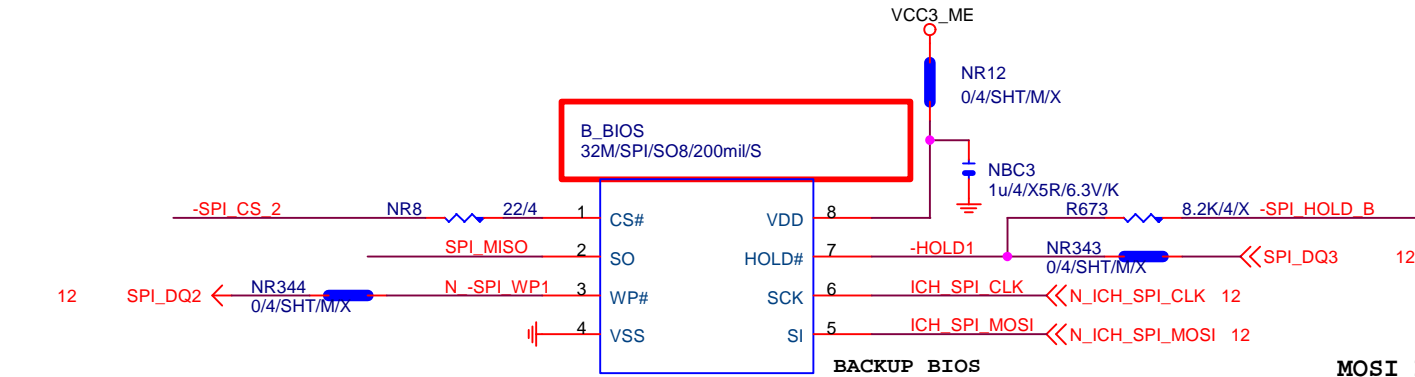
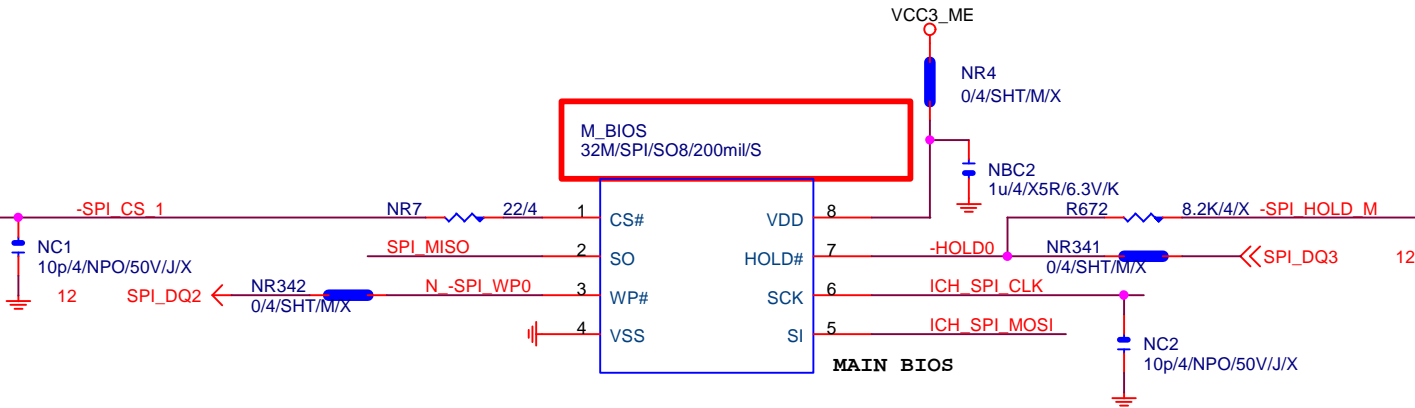


-PROHOT



Gigabyte Technology

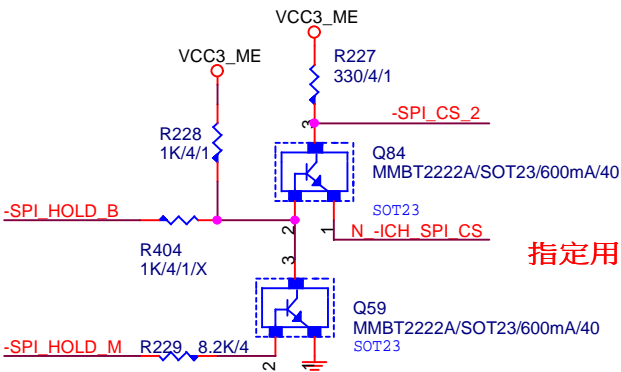
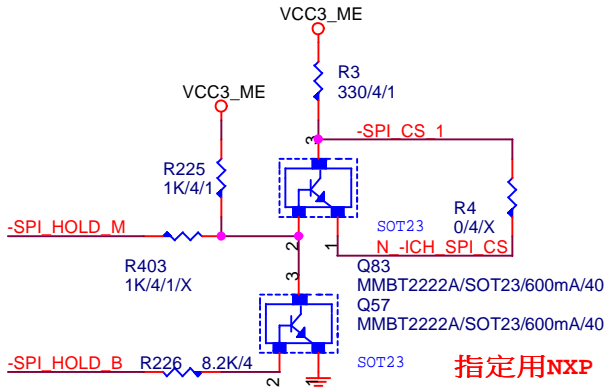
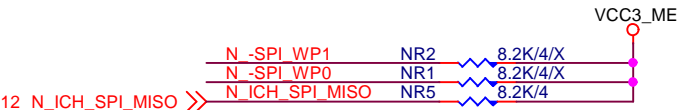
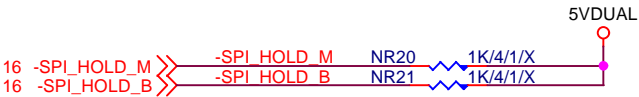
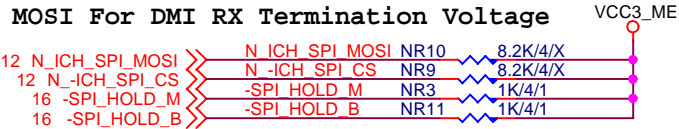
Title			HWM,FAN CTRL,OV
Size	Document Number	GA-H81M-HD2	
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BOOT DEVICE	GNT0	GNT1
LPC	0	0
PCI	0	1
NAND	1	0
SPI	1	1

1 means floating
0 means PD 1K

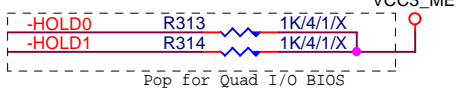
MOSI For DMI RX Termination Voltage



指定用NXP

指定用NXP

CHECK



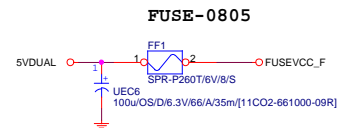
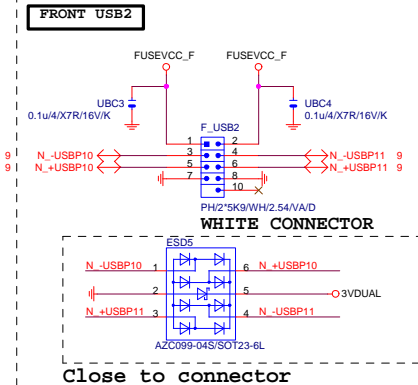
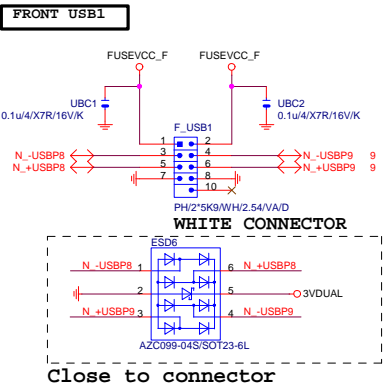
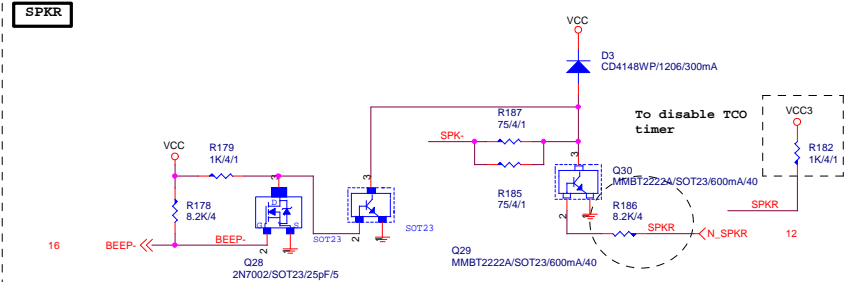
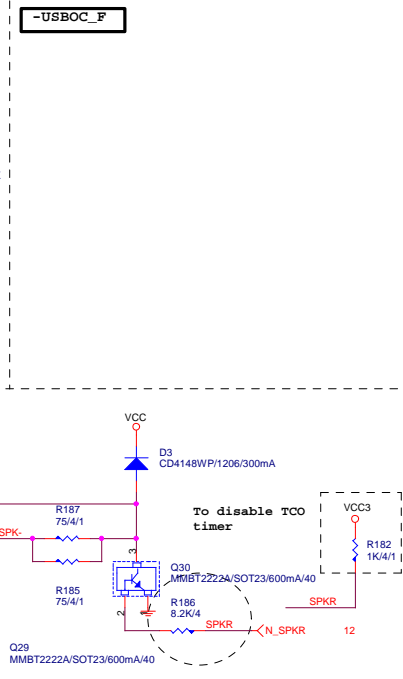
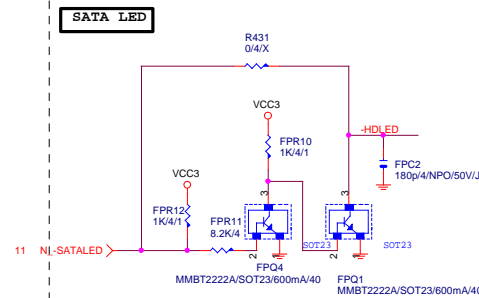
Gigabyte Technology

DUAL BIOS

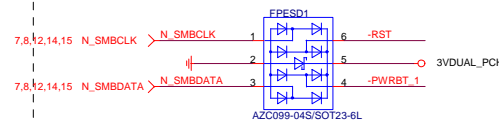
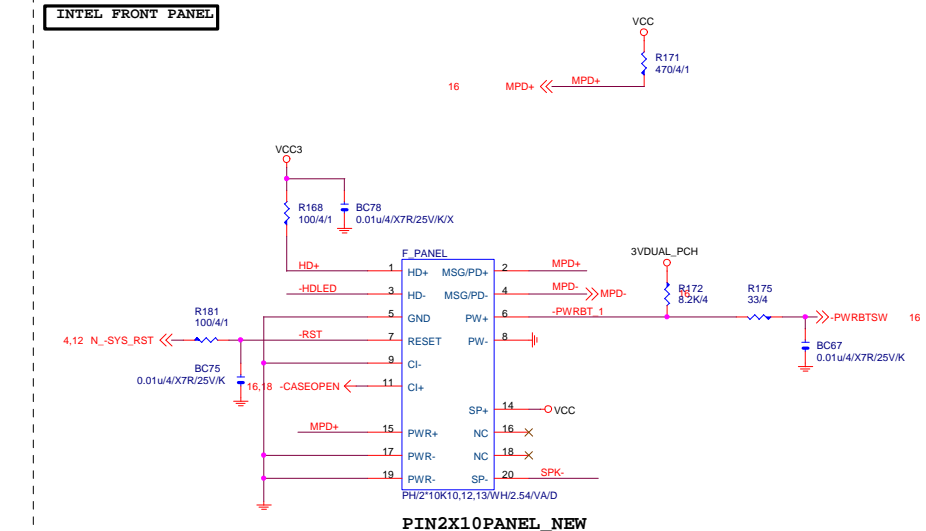
GA-H81M-HD2

Rev 1.0

Title		Document Number		Rev
Size Custom		Wednesday, January 15, 2014		1.0
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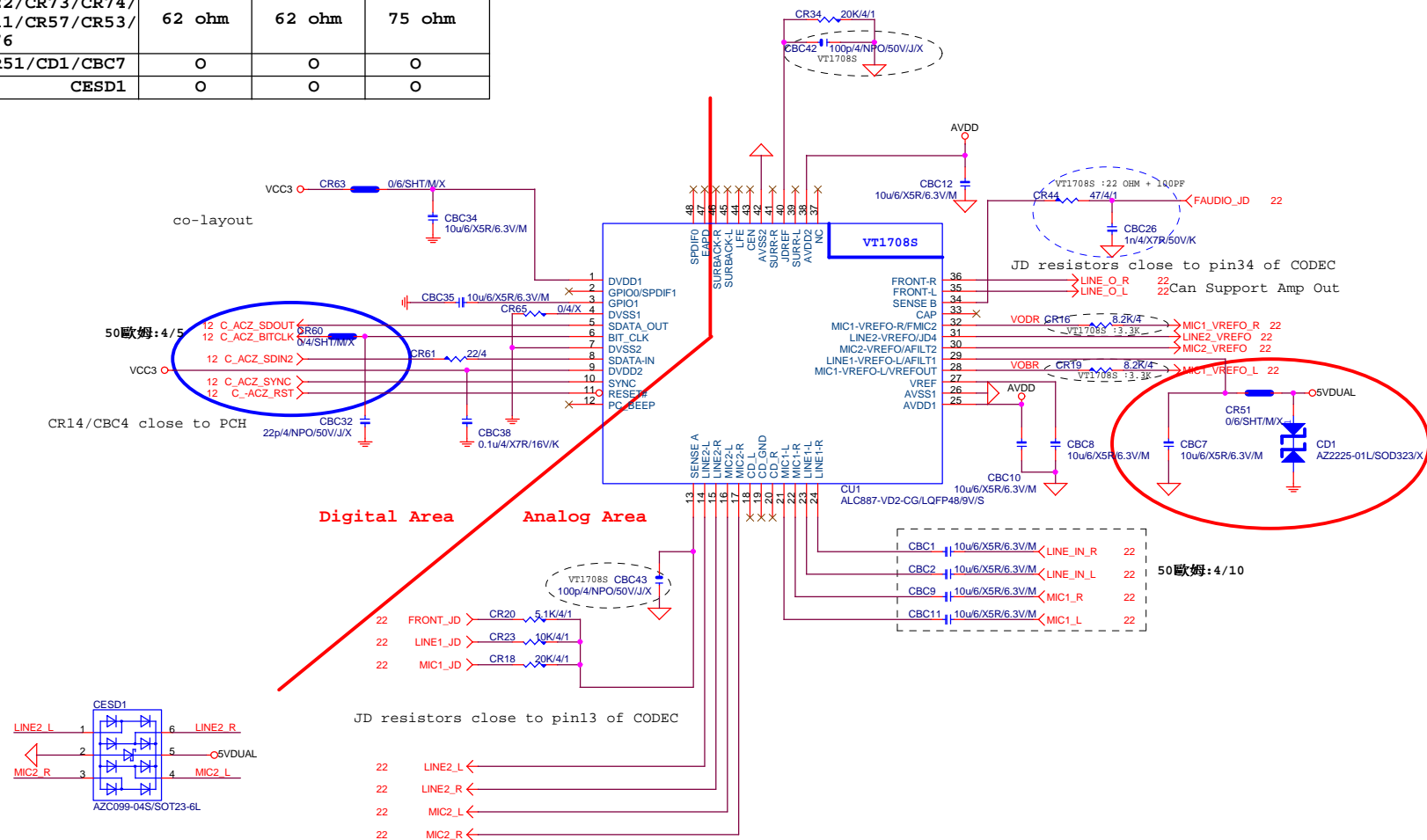
F_USB1, F_USB2 4-Port 2.6A

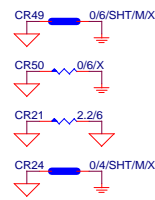


Gigabyte Technology			
FP,F_USB,USB PWR,SPKR,SATA LED			
GA-H81M-HD2			
Size	Document Number	Rev	1.0
Custom			
Date:	Wednesday, January 15, 2014	Sheet	20 of 29

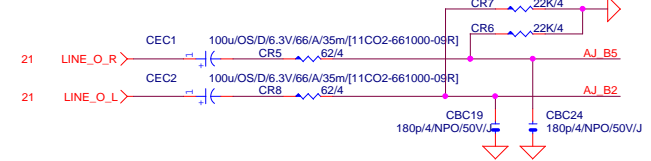
AZALIA CODEC **ALC892/ALC887-VD2/VT1708-CE Colay**

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





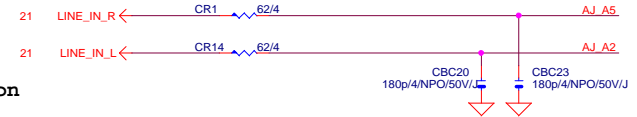
LINE-OUT



LINE-IN

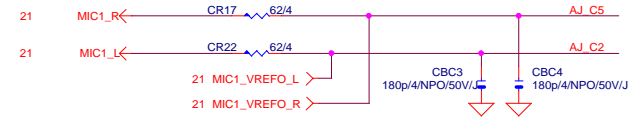
Verify MIC function
in LINE-in

Only reserved for ALC888

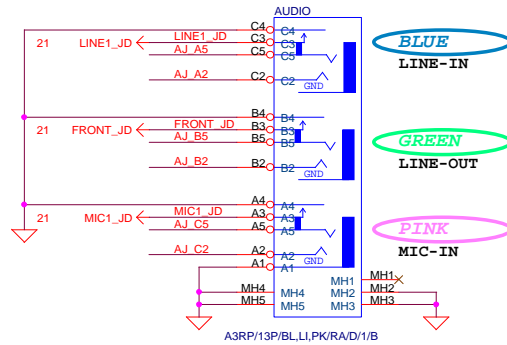


For 889A/888

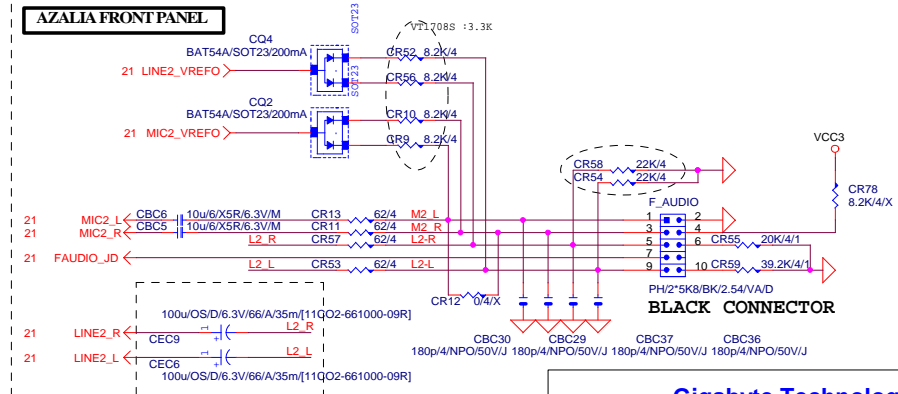
MIC-IN



SPDIF_OUT



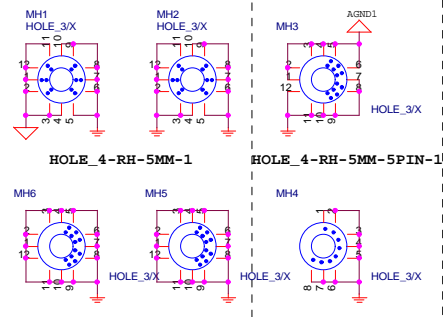
AZALIA FRONT PANEL



Gigabyte Technology

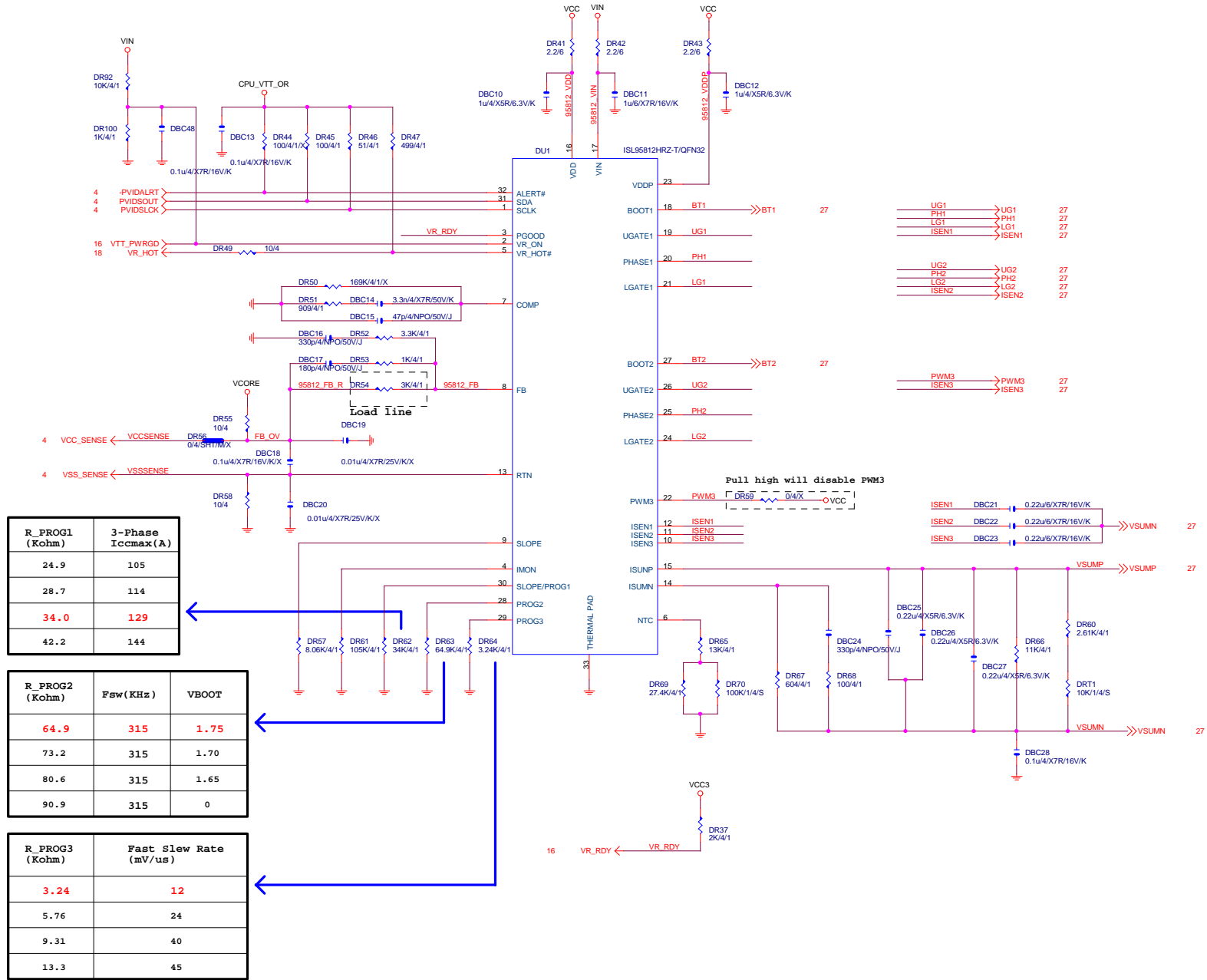
Title			
AUDIO JACK			
Size	Document Number		Rev
Custom	GA-H81M-HD2		1.0
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【技術通報R&D技術通報155】

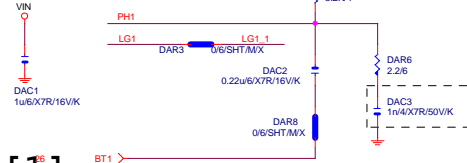
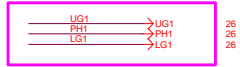


To fix 12V light load
abnromal issue +12V LOAD

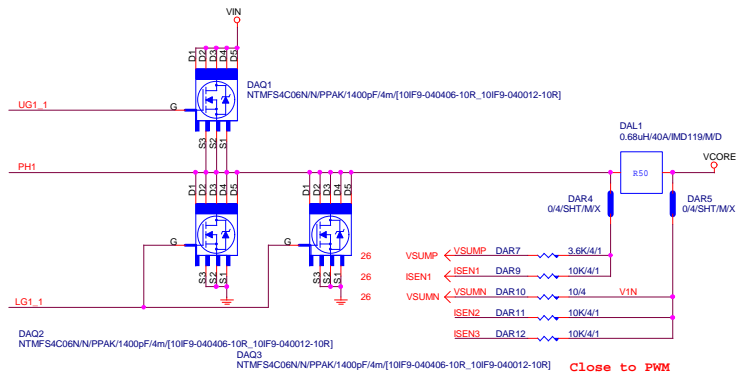




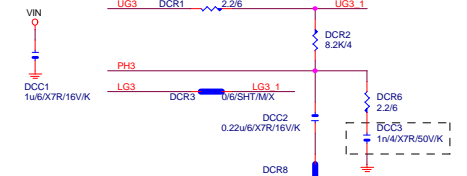
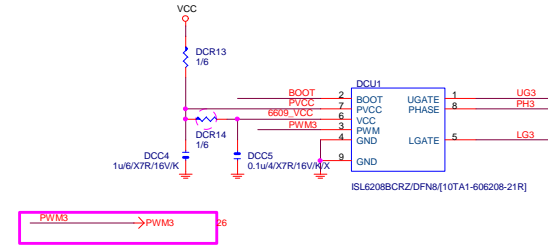
PHASE 1



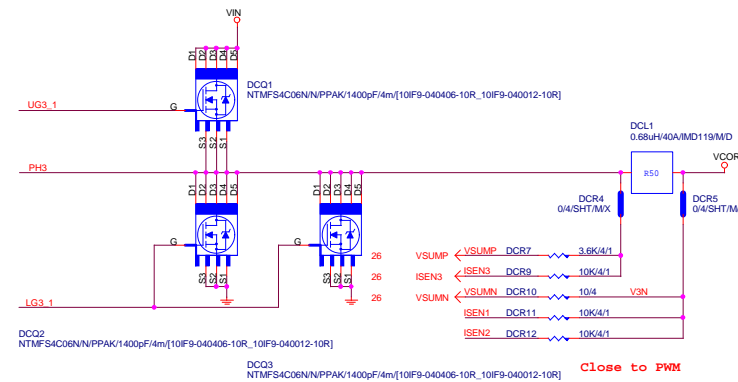
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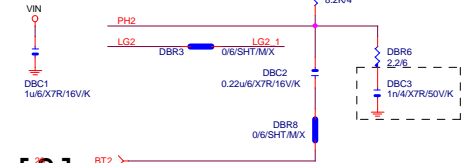
PHASE 3



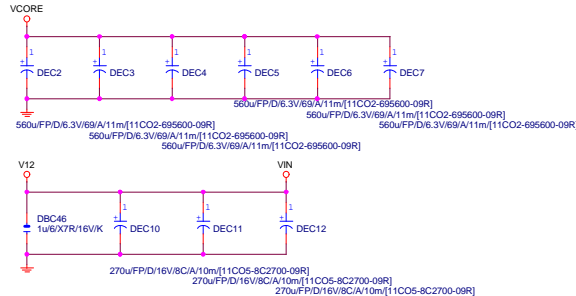
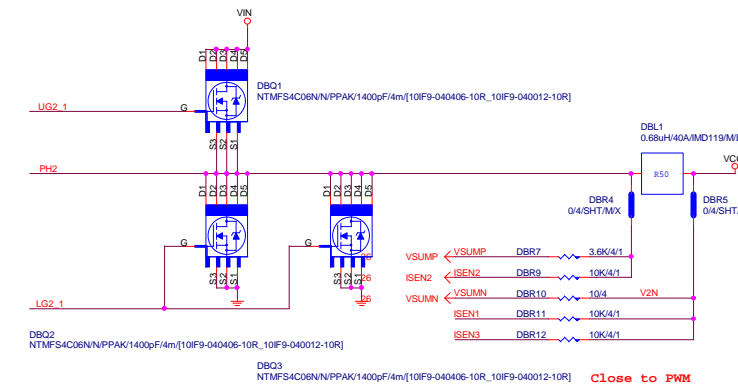
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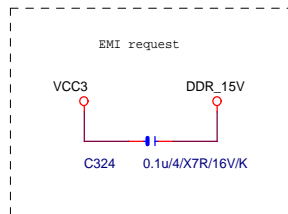


PHASE 2



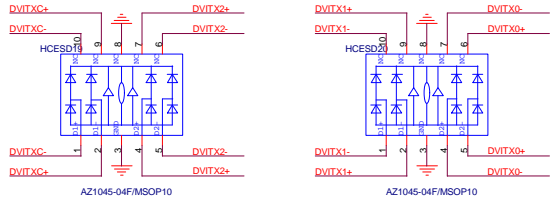
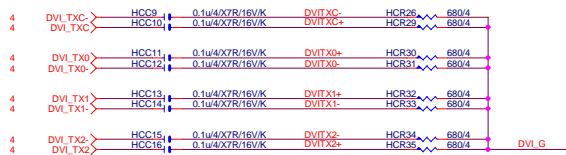
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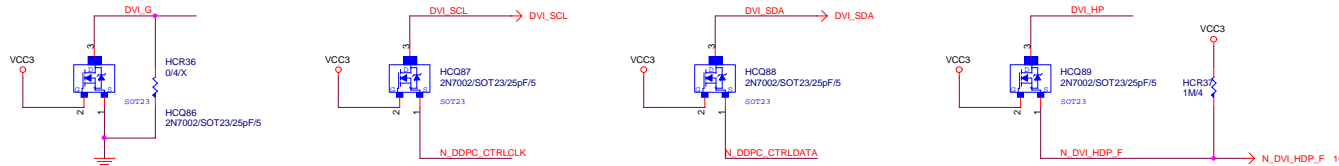
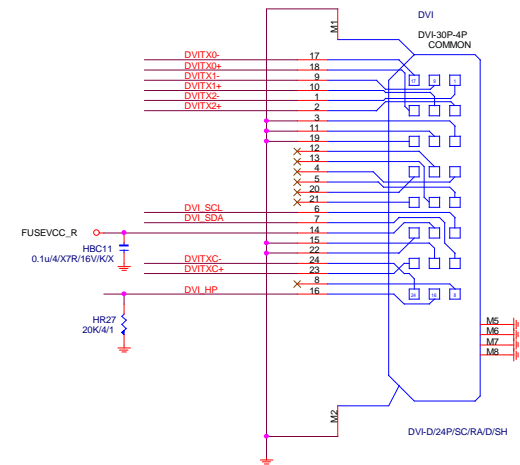
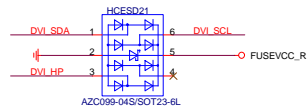
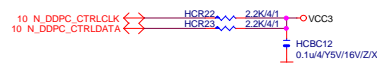
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10



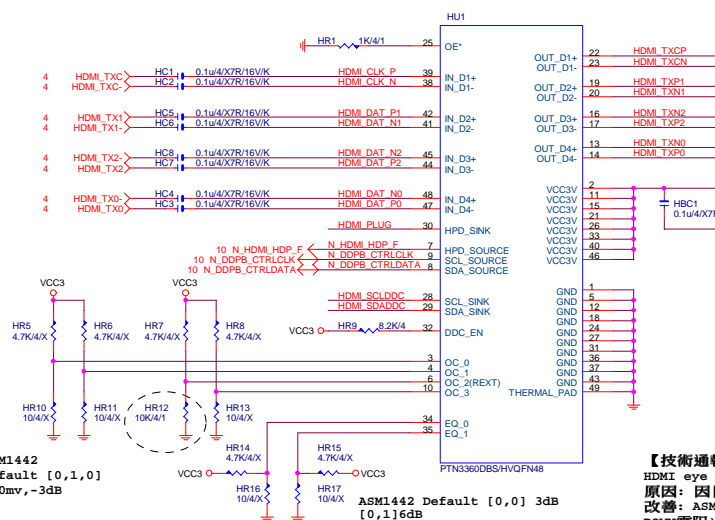
Close to connector

Close to connector



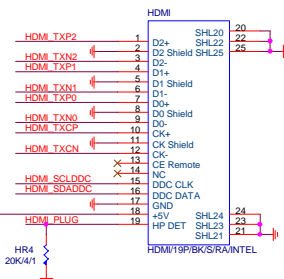
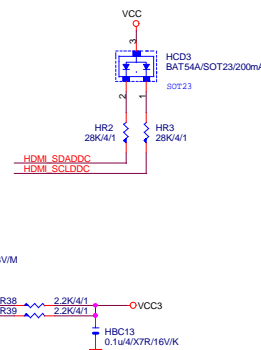
HDMI LEVEL SHIFT

HDMI:20/4/6/4/20
Impedance=85 +- 17.5%



【技術通報R&D技術通報150】

HDMI eye diagram 1.4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)



Gigabyte Technology			
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