Model Name: GA-H81M-S2PV *Revision 2.0*

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 SLOT
16	PCI SLOT 1,2
17	ITE 8620 LPC IO
18	COM,LPT,KB_MS
19	HWM,FAN CTRL,OV,-PROCHOT
20	DUAL BIOS
21	R_USB30,FP,FUSB,SPK,SATALED
22	Realtek ALC887-VD2
23	REAR AUDIO JACK
24	REALTEK RTL8111F
25	DISCRETE POWER
26	ATX
27	VCORE ISL95812 1

SHEET	TITLE
28	VCORE ISL95812 2
29	RT8120_DDR POWER
31	DVI
32	IT8892E

Gigabyte Technology

Title: Cover Sheet		
Size: Custom	Document Number: GA-H81M-S2PV	Rev: 2.0
Date: Wednesday, April 09, 2014	Sheet 1 of 31	

Model Name: GA-H81M-S2PV

Revision 2.0

Component value change history

2014/04/02

Data	Change Item	Reason
2013/06/24	Update Rev to 1.0	PBOM: 9MH81MS2V-00-10A
2013/06/28	Update Rev to 1.01	PBOM: 9MH81MS2V-00-10B
	ADD RSMRST DELAY	
	ADD 5VSB Protection	
2013/07/03	Remove Super I/O OVP/UVP Function	PBOM: 9MH81MS2V-00-10C
2013/07/11	導入5VSB OVP Protection	PBOM: 9MH81MS2V-00-10D
	DEL R704: 8.2K/4	
	ADD R706: 8.2K/4	
	R705: 715/4/1 -> 825/4/1	
	AUDIO AZ2225-01L CD1移除	
2013/08/19	REMOVE WR57 FIX IT8620 TEMP ISSUE	FPBOM: 9MH81MS2V-00-10E
2013/09/13	Update to R1.02	
	Follow Crystal Trace Rule	
	SYS_FAN, DDR 0ohm 0402 -> 0603	
	Update Fuse 1206 Footprint "POLYSWITCH-1206-1"	
	Update PPAK Footprint "Q_TDSON8-GDS-T"	
2013/10/22	NX1: 25M/20p -> 12p	FPBOM: 9MH81MS2V-00-10F
	NC7, NX8: 27p -> 10p	
2013/11/04	NC7, NX8: 10p -> 15p	FPBOM: 9MH81MS2V-00-10H
2013/11/19	R1.03	FPBOM: 9MH81MS2V-00-10G (R1.03)
	FIX Crystal 2G phone issue	
2013/11/27	MR17 0ohm -> 0603 FUSE(10FP5-06100B-00R)	FPBOM: 9MH81MS2V-00-10I (R1.03)
2014/02/17	Sales Costdown Rev	
	CPU Power ISL95812 1U2D -> ISL95812 1U1D	
	DVI Non-Level Shift	
	BIOS Size 64M -> 32M	
	0ohm -> Short Pad	
2014/02/25	整合電阻成排阻	
2014/04/02	ADD NC60, NC61	FPBOM: 9MH81MS2V-00-20A
	DEL OR47, OC27, RS2	

Circuit or PCB layout change

DATE	Change Item	Reason

Gigabyte Technology

Title: BOM & PCB MODIFY HISTORY

Size: Custom | Document Number: GA-H81M-S2PV | Rev: 2.0

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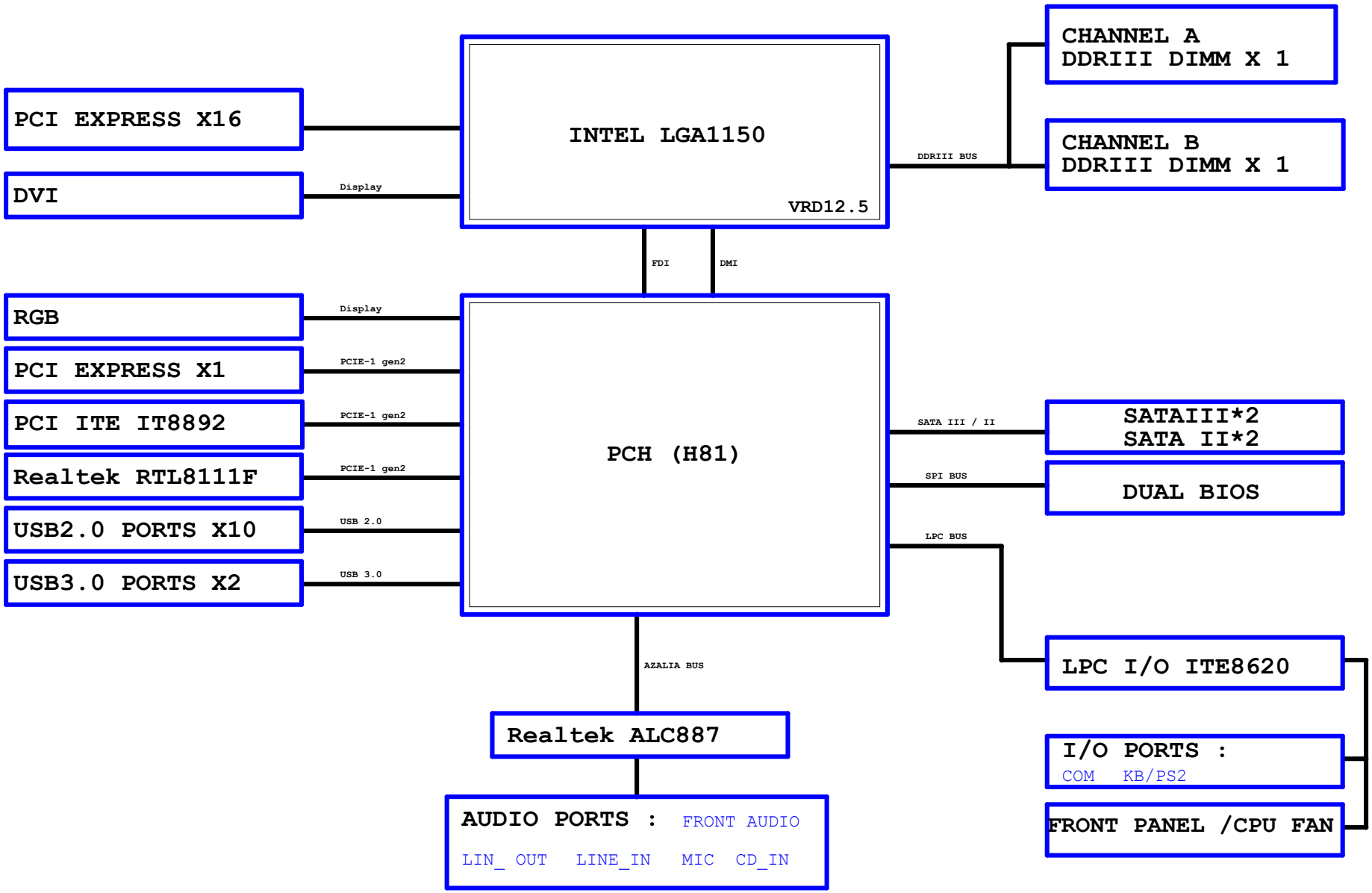
BLOCK DIAGRAM



Gigabyte Technology		
Title: BLOCK DIAGRAM		
Size: C	Document Number: GA-H81M-S2PV	Rev: 2.0
Date: Wednesday, April 09, 2014	Sheet 3 of 31	

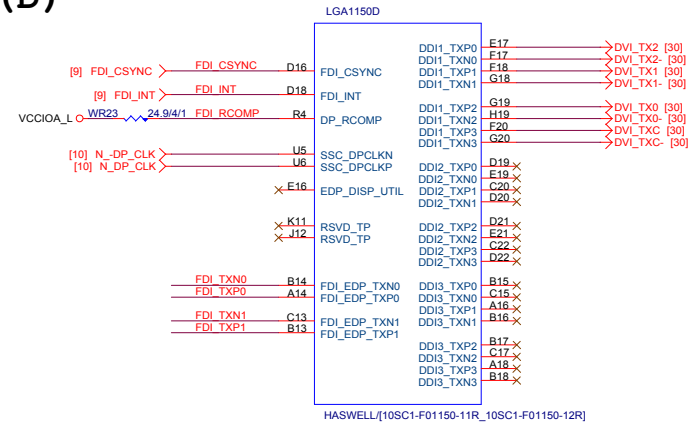
LGA1150 (E)

CFG	H	L	NOTE
0	RSVD	RSVD	RSVD
1	RSVD	RSVD	RSVD
2	**NORM**	**Reverse**	LANE REVERSAL[0],x16
3	RSVD	RSVD	RSVD
4	**Disable**	**Enable**	eDP Enable
7	RSVD	RSVD	RSVD
8	RSVD	RSVD	RSVD
9	RSVD	RSVD	RSVD
10	RSVD	RSVD	RSVD
11	RSVD	RSVD	RSVD
12	RSVD	RSVD	RSVD
13	RSVD	RSVD	RSVD
14	RSVD	RSVD	RSVD
15	RSVD	RSVD	RSVD
16	RSVD	RSVD	RSVD
17	RSVD	RSVD	RSVD

CFG6	CFG5	PCIE CONFIG
1	1	1X16 , Default
1	0	2X8
0	1	RSVD
0	0	X8,X4,X4

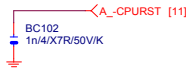
CFG 0-17 all internal PULL-UP

LGA1150 (D)

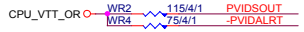


LGA1155 (C)

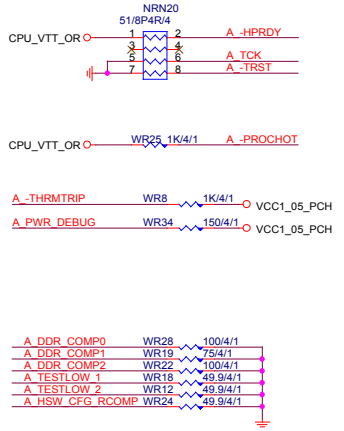
-CPURST



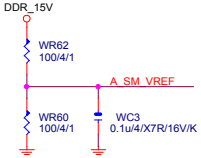
CPU SVID



CPU PU/PD



SM REF



Title	CPU LGA1150-A		
Size: Custom	Document Number: GA-H81M-S2PV		Rev: 2.0
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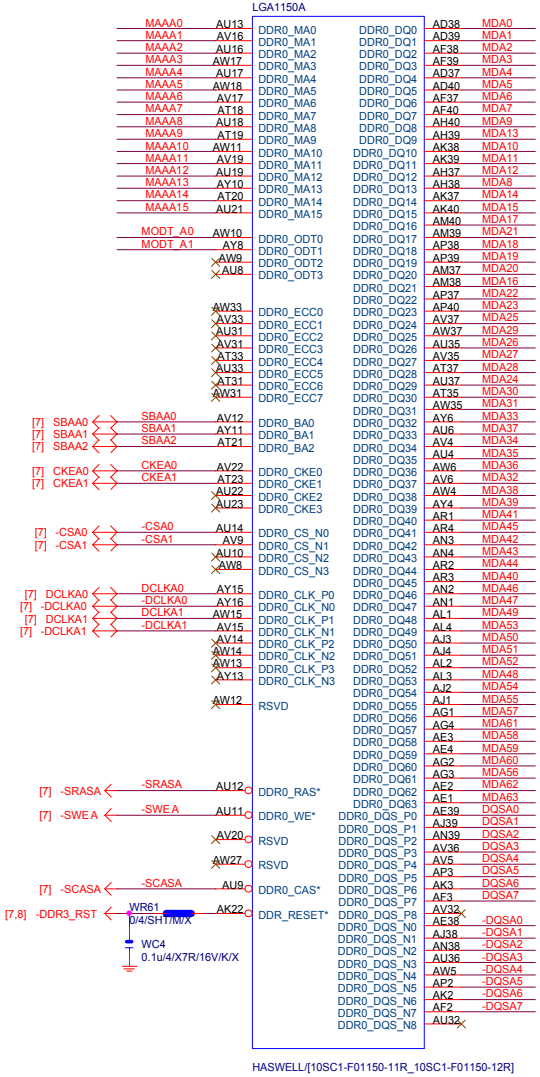
Gigabyte Technology

LGA1150 (A)

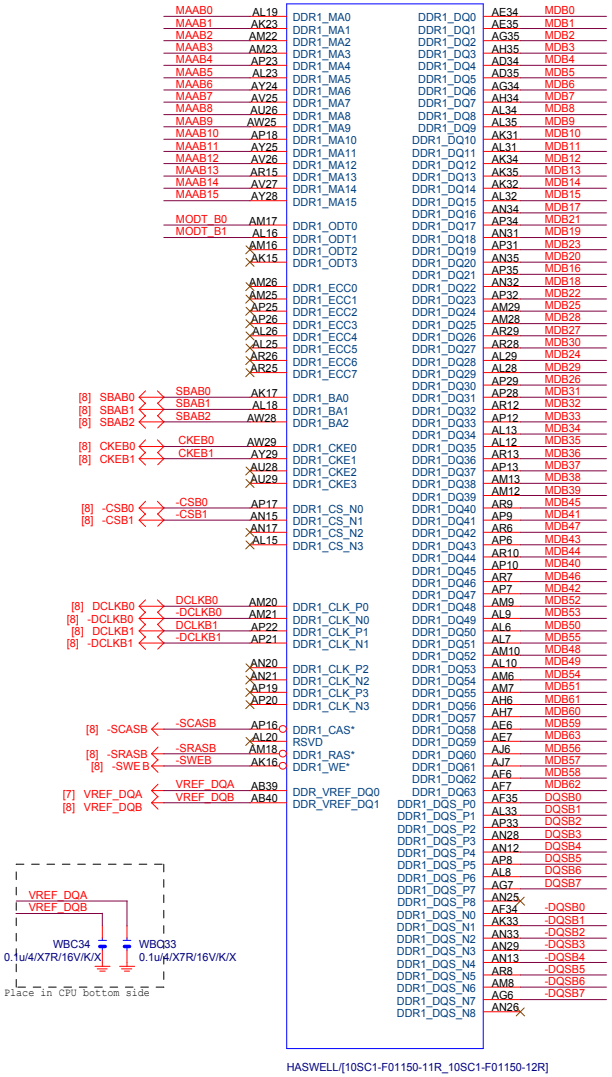
LGA1150A



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

LGA1150 (B)

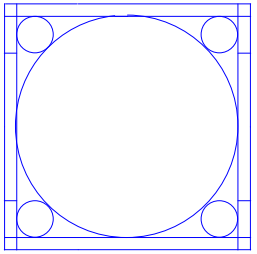
LGA1150B



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

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..1] MODT_A[0..1]
[8] MODT_B[0..1] MODT_B[0..1]
[7] MDA[0..63] MDA[0..63]
[8] MDB[0..63] MDB[0..63]
[7] DQSA[0..7] DQSA[0..7]
[7] -DQSA[0..7] -DQSA[0..7]
[7] MAAA[0..15] MAAA[0..15]
[8] MAAB[0..15] MAAB[0..15]
[8] DQSB[0..7] DQSB[0..7]
[8] -DQSB[0..7] -DQSB[0..7]

Gigabyte Technology		
Title: CPU LGA1150-B		
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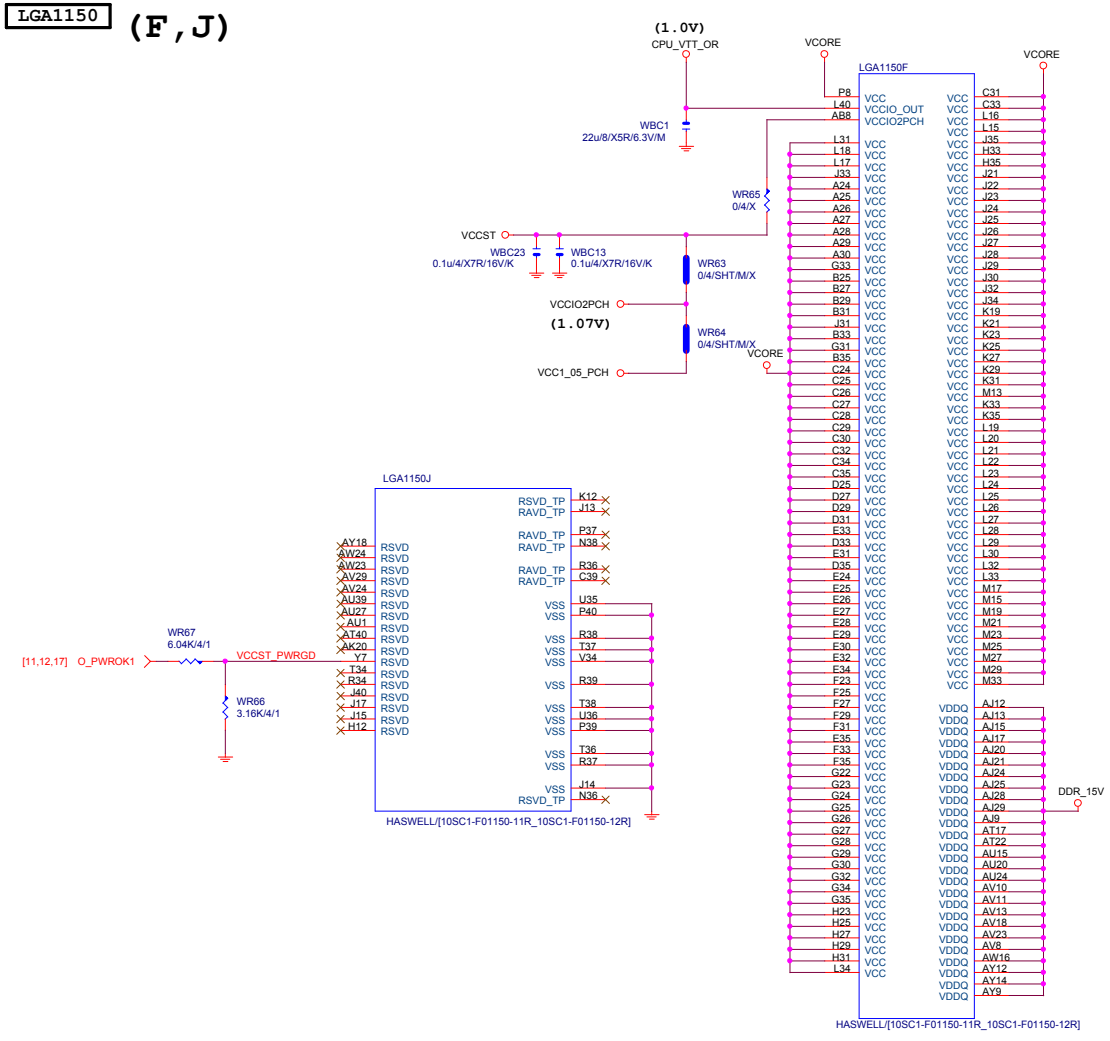
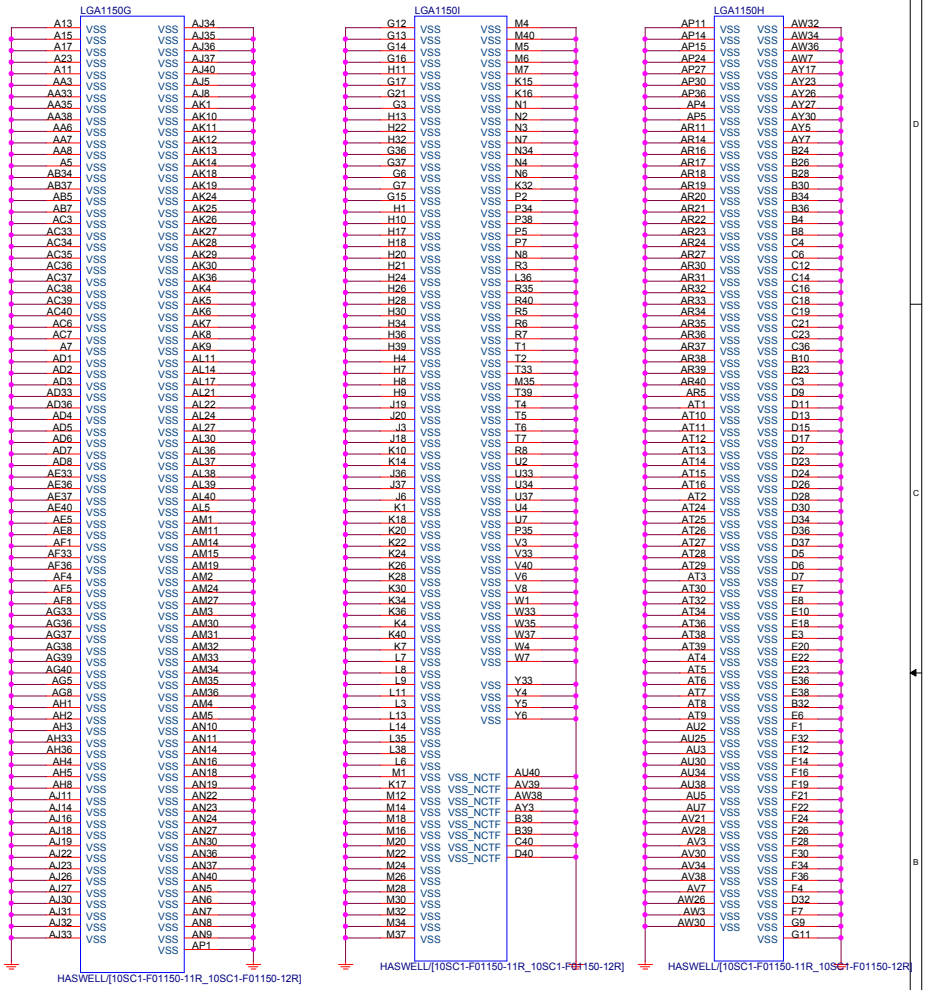
LGA1150 (F,J)

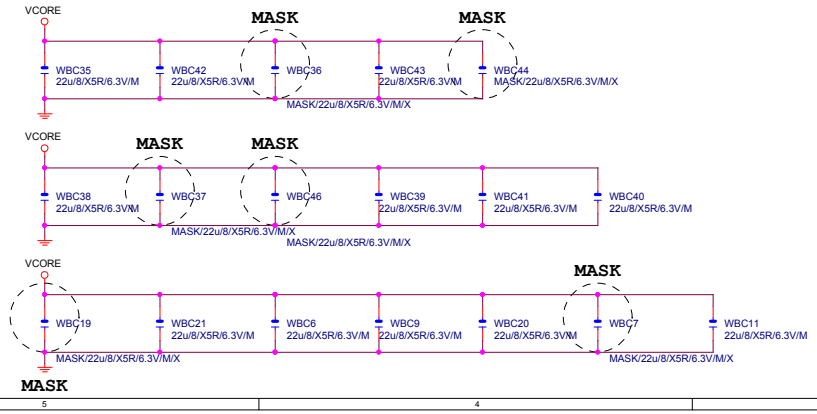


LGA1155 (G,H,I)



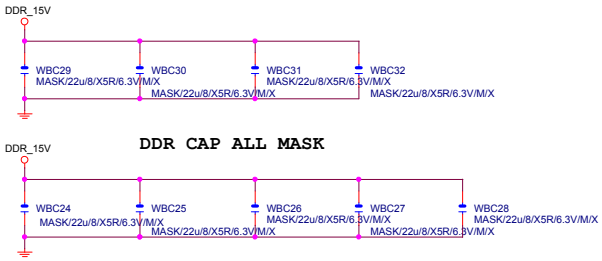
VCore CAP

(X12)



DDR CAP

(X0)



Gigabyte Technology		
Title: CPU LGA1150-C		
Size: Custom	Document Number: GA-H81M-S2PV	Rev: 2.0
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DDR3 (A)

DDR3_1

DDRVTT

DDR_15V

N_SMBDATA
N_SMBCLK

MC10 100p/4/NPO/50V/J/X
MC11 100p/4/NPO/50V/J/X

【技術通報R&D技術通報169】

MF1 SPR-P200T/6V/8/S
VCC3 — VDDSPD

MC4 0.1u/4/X7R/16V/K/X
VDDSPD

MC5 VREF_DDRA
MC1 VREF_DQDDRA
0.1u/4/X7R/16V/K/X

[8,12,14,15,16,19,21] N_SMBCLK
[8,12,14,15,16,19,21] N_SMBDATA

[5] SBAA2
[5] SBAA1
[5] SBAA0

[5] CKEA1
[5] CKEA0

[5] -CSA1
[5] -CSA0

[5] -DCLKA1
[5] DCLKA1

[5] -DCLKA0
[5] DCLKA0

[5] MAAA[0..15]

[5,8] -DDR3_RST
[5] -SCASA
[5] -SRASA
[5] -SWEA

-DDR3_RST
MC6 100p/4/NPO/50V/J

DDR3/240/BK/VA/D

BLACK CONNECTOR

MODT_A[0..1] — MODT_A[0..1] [5]
-DQSA[0..7] — -DQSA[0..7] [5]
DQSA[0..7] — DQSA[0..7] [5]

MDA[0..63] [5]

DDR3 VREF

DDR_15V
MR15 1K/4/1
MR14 1K/4/1
VREF_DDRA

DDR_15V
MR4 1K/4/1
MR5 1K/4/1
VREF_DQDDRA — VREF_DQA [5]

DDR15V Decouple

DDR_15V
MEC1 560u/FP/D/6.3V/69/A/11m/[11CO2-695600-09R]
MEC2 560u/FP/D/6.3V/69/A/11m/[11CO2-695600-09R]

DDR_15V
MBC1 0.1u/4/X7R/16V/K
MBC2 0.1u/4/X7R/16V/K
MBC3 0.1u/4/X7R/16V/K
MBC24 0.1u/4/X7R/16V/K/X
MBC12 0.1u/4/X7R/16V/K
MBC14 0.1u/4/X7R/16V/K

DDR_15V
MBC15 1u/4/X5R/6.3V/K
MBC17 1u/4/X5R/6.3V/K
MBC27 1u/4/X5R/6.3V/K/X
MBC29 1u/4/X5R/6.3V/K/X
MBC35 1u/4/X5R/6.3V/K/X
MBC36 1u/4/X5R/6.3V/K
MBC37 1u/4/X5R/6.3V/K/X
MBC47 1u/4/X5R/6.3V/K/X
MBC9 1u/4/X5R/6.3V/K/X

DDRVTT Decouple

DDRVTT
MBC40 10u/6/X5R/6.3V/M

DDRVTT
MBC18 1u/4/X5R/6.3V/K
MBC10 0.1u/4/Y5V/16V/Z

Gigabyte Technology

Title: DDRIII CHANNEL A

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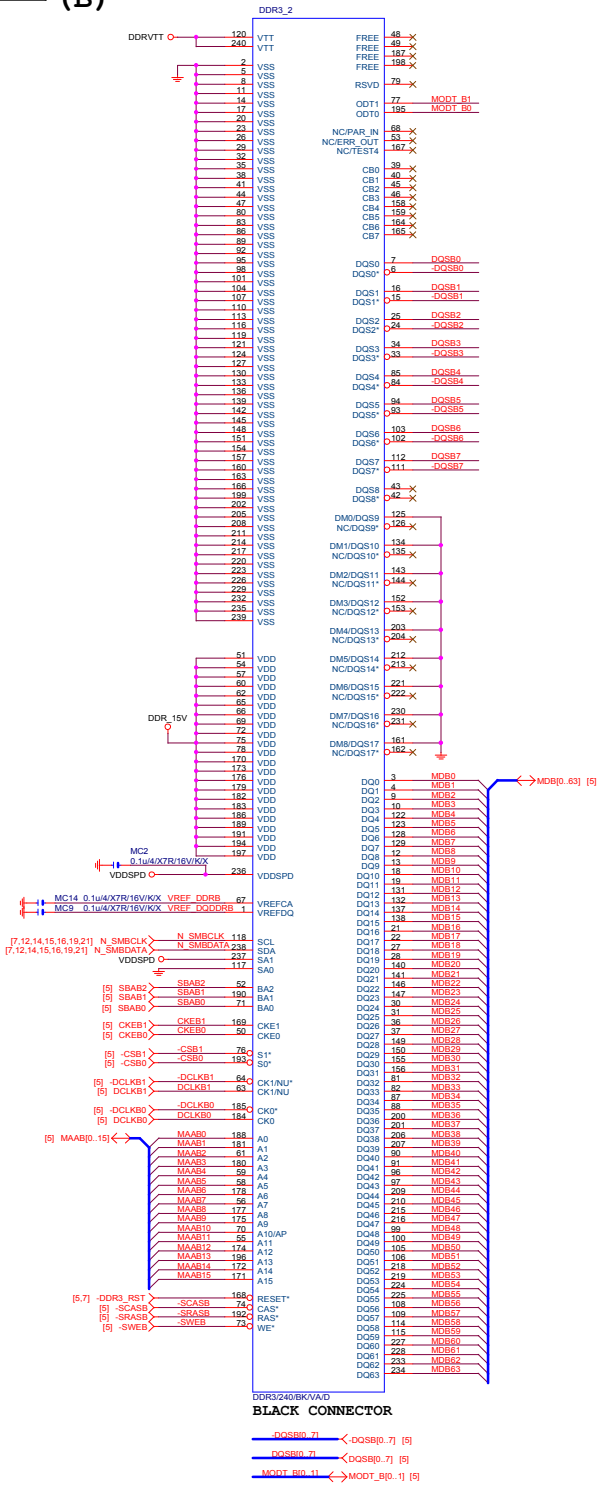
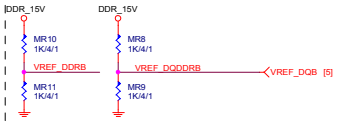
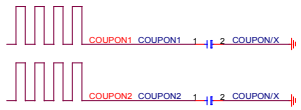
DDR3 (B)

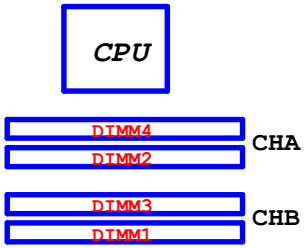


DDR3 VREF



COUPON





Gigabyte Technology

Title	DDRIII CHANNEL B		
Size: Custom	Document Number: GA-H81M-S2PV		Rev: 2.0
Date:	Sheet 8 of 31		

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%

PCHB

DMI_RXN_0 DMI_RXP_0 DMI_TXN_0 DMI_TXP_0 DMI_RXN_1 DMI_RXP_1 DMI_TXN_1 DMI_TXP_1 DMI_RXN_2 DMI_RXP_2 DMI_TXN_2 DMI_TXP_2 DMI_RXN_3 DMI_RXP_3 DMI_TXN_3 DMI_TXP_3 DMI

[4] A_DMI_0TXN A_DMI_0TXP [4] A_DMI_0RXN A_DMI_0RXP [4] A_DMI_1TXN A_DMI_1TXP [4] A_DMI_1RXN A_DMI_1RXP [4] A_DMI_2TXN A_DMI_2TXP [4] A_DMI_2RXN A_DMI_2RXP [4] A_DMI_3TXN A_DMI_3TXP [4] A_DMI_3RXN A_DMI_3RXP

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

VCC1_5_PCH — NR50 7.5K/4/1 DMI_COMP — PCIE_COMP C13 — NR40 7.5K/4/1

DMI_RCOMP PCIE_RCOMP

CK_-SRCCLK_PCH G22 CK_SRCCLK_PCH F22

CLKIN_DMI_N CLKIN_DMI_P

USB

USBN_0 USBP_0 USBN_1 USBP_1 USBN_2 USBP_2 USBN_3 USBP_3 USBN_4 USBP_4 USBN_5 USBP_5 USBN_6 USBP_6 USBN_7 USBP_7 USBN_8 USBP_8 USBN_9 USBP_9 USBN_10 USBP_10 USBN_11 USBP_11 USBN_12 USBP_12 USBN_13 USBP_13

AV10 AU10 AV11 AW11 AN14 AP14 AJ16 AK16 AU15 AV15 AU12 AT12 AV14 AW14 AU17 AT17 AW16 AV16 AN16 AP16 AJ18 AK18 AP18 AN18 AW18 AV18 AP20 AN20

N_-USBP0 [21] N_+USBP0 [21] N_-USBP1 [21] N_+USBP1 [21] N_-USBP2 [24] N_+USBP2 [24] N_-USBP3 [24] N_+USBP3 [24]

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

N_-USBP8 [21] N_+USBP8 [21] N_-USBP9 [21] N_+USBP9 [21] N_-USBP10 [21] N_+USBP10 [21] N_-USBP11 [21] N_+USBP11 [21]

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

PCIE

PCIE_PERN_1_USB3_RXN_2 PCIE_PERP_1_USB3_RXP_2 PCIE_PETN_1_USB3_TXN_2 PCIE_PETP_1_USB3_TXP_2 PCIE_PERN_2_USB3_RXN_3 PCIE_PERP_2_USB3_RXP_3 PCIE_PETN_2_USB3_TXN_3 PCIE_PETP_2_USB3_TXP_3

L14 K14 B12 B11 F14 G14 D11 C11

PCIE Only

PCIE_PERN_3 PCIE_PERP_3 PCIE_PETN_3 PCIE_PETP_3 PCIE_PERN_4 PCIE_PERP_4 PCIE_PETN_4 PCIE_PETP_4 PCIE_PERN_5 PCIE_PERP_5 PCIE_PETN_5 PCIE_PETP_5 PCIE_PERN_6 PCIE_PERP_6 PCIE_PETN_6 PCIE_PETP_6 PCIE_PERN_7 PCIE_PERP_7 PCIE_PETN_7 PCIE_PETP_7 PCIE_PERN_8 PCIE_PERP_8 PCIE_PETN_8 PCIE_PETP_8

8111F: [24] LA_ML_IN [24] LA_ML_IP [24] LA_ML_ON [24] LA_ML_OP
8892: [31] G_PCIEBIN [31] G_PCIEBIP [31] G_PCIEBON [31] G_PCIEBOP
PCIEx1: [15] PI_PCIEX1_IN [15] PI_PCIEX1_IP [15] PI_PCIEX1_ON [15] PI_PCIEX1_OP

N/A

OC0B_GP59 OC1B_GP40 OC2B_GP41 OC3B_GP42 OC4B_GP43 OC5B_GP9 OC6B_GP10 OC7B_GP14

AE40 AF37 AD39 AD40 AF39 AC41 AF40 AG40

N_-USBOC_F [21] N_-USBOC_R [21] N_GPIO14

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

USBRBIASB USBRBIAS

AV20 AU20 N_USBRBIAS NR47 22.6/4/1

CLKIN_DOT96N CLKIN_DOT96P

AP11 AM11 CK_-DOTCLK CK_DOTCLK

NR130 8.2K/4

N_GPIO14 — 3VDUAL

N_-USBOC_F — NBC82 0.1u/4/X7R/16V/K

N_-USBOC_R — NBC83 0.1u/4/X7R/16V/K

CHIP DH82H81 C2 INTEL/[10HB1-030H81-10R]

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 (F)

PCHF

USB3

[21] PCH_USB3_RXN0 [21] PCH_USB3_RXP0 [21] PCH_USB3_TXN0 [21] PCH_USB3_TXP0 [21] PCH_USB3_RXN1 [21] PCH_USB3_RXP1 [21] PCH_USB3_TXN1 [21] PCH_USB3_TXP1

F20 G20 B18 C18 G18 H18 B15 B16

USB3_RXN_0 USB3_RXP_0 USB3_TXN_0 USB3_TXP_0 USB3_RXN_1 USB3_RXP_1 USB3_TXN_1 USB3_TXP_1

N/A

K20 L20 D15 C15 L18 K18 B14 A14

USB3_RXN_4 USB3_RXP_4 USB3_TXN_4 USB3_TXP_4 USB3_RXN_5 USB3_RXP_5 USB3_TXN_5 USB3_TXP_5

VCC3 — NR62 8.2K/4/X — NR63 8.2K/4/X

AK28 AT34

TACH6_GP70 TACH7_GP71

FDILINK

FDI_RXN_0 FDI_RXP_0 FDI_RXN_1 FDI_RXP_1

N1 FDI_TXN0 N2 FDI_TXP0 P2 FDI_TXN1 P3 FDI_TXP1

FDI_CSYNC — L2 FDI_CSYNC — FDI_CSYNC [4]

FDI_INT — L3 FDI_INT — FDI_INT [4]

FDI_RCOMP — K2 NR29 7.5K/4/1 — VCC1_5_PCH

CHIP DH82H81 C2 INTEL/[10HB1-030H81-10R]

FDI_TXP[0..1] — FDI_TXP[0..1] [4]

FDI_TXN[0..1] — FDI_TXN[0..1] [4]

USB3.0:20/5/7/5/20 (breakout min 8/4/4/4/8) ; ONLY 3 VIAS
Impedance=85 +- 17.5%
Back Panel < 10000 MILS
Front Panel < 6000 MILS

PCH CLK PD

CK_SRCCLK_PCH NR89 8.2K/4
CK_-SRCCLK_PCH NR88 8.2K/4

Mount for integrated clock Generation Mode

NRN14 8.2K/8P4R/4

[10] N_PCHCLK14 — CK_DOTCLK — CK_-DOTCLK

PCH (J)

PCHJ

AT1 AT41 AU1 AV1 AV2 AV40 AV41 AW2 AW40 B40 B41 C41 D1 D41

VSS_NCTF

TP22 TP23 TP21 TP20 TP14 TP15 TP12 TP10 TP11 TP9 TP3 TP4 TP1 TP2 TP5 TP6 TP7 TP8

U11 U10 AJ14 AK14 K34 K33 AH24 L16 K16 AM34 R12 N12 L22 K22 R4 K5 P5 L5

VSS — AC31

VSS — AF3

VSS — AV21

CHIP DH82H81 C2 INTEL/[10HB1-030H81-10R]

PCH H/S

LOW COST ICH7 HEATSINK

SB_HEATSIN

1 2

GRAY HS

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

USB TABLE

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

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

Gigabyte Technology

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

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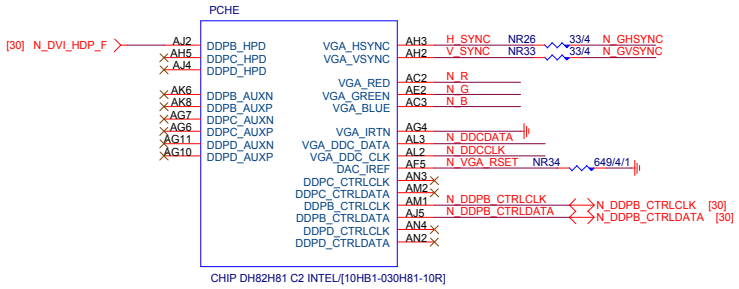
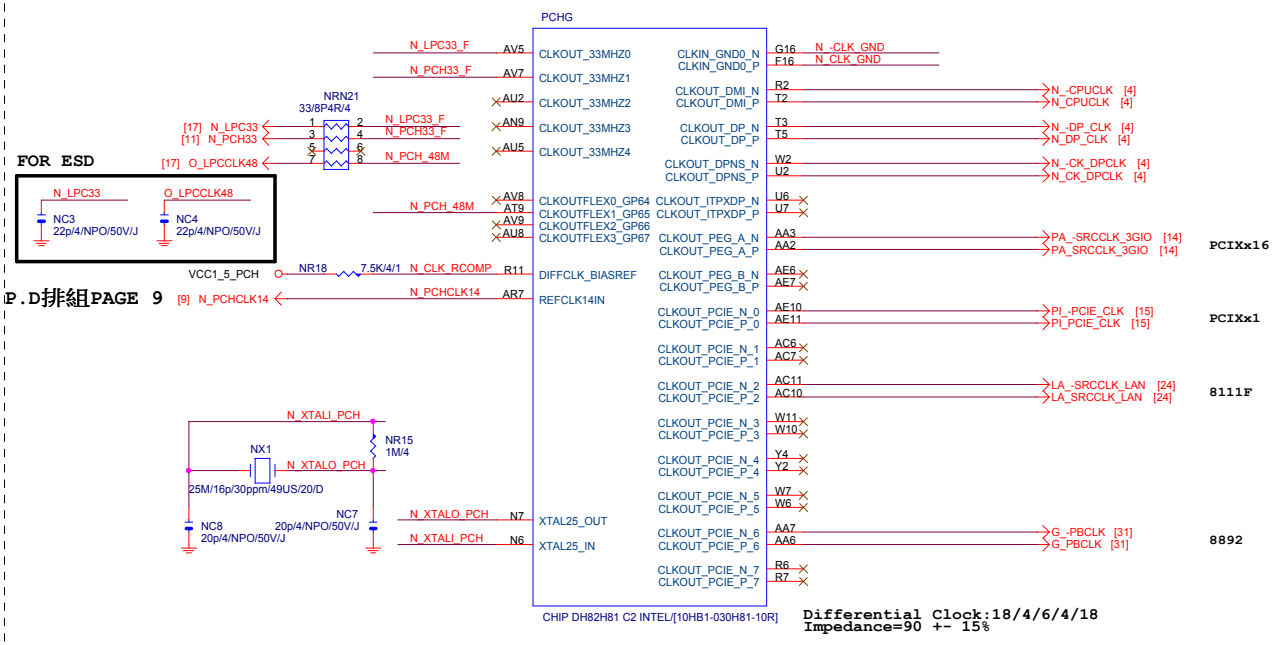
PCH (E)

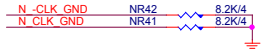


PCH (G)

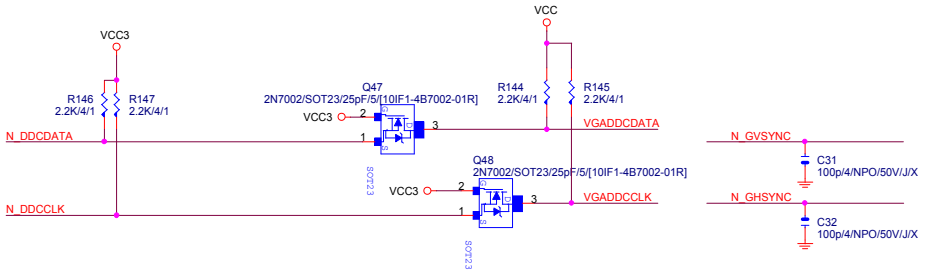


Differential Clock:18/4/6/4/18
Impedance=90 +- 15%

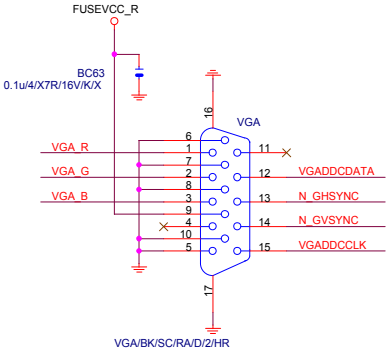
PCH CLK PD



VGA DDC

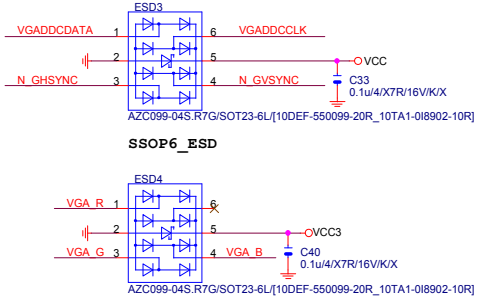


VGA CONNECTOR

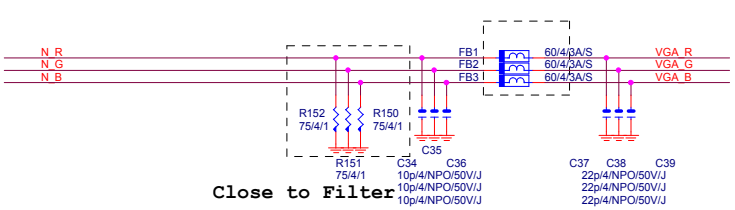


BLACK CONNECTOR

VGA ESD



VGA DDC



Close to Filter

Gigabyte Technology

Title	PCH DISPLAY ,CLK BUFFER		
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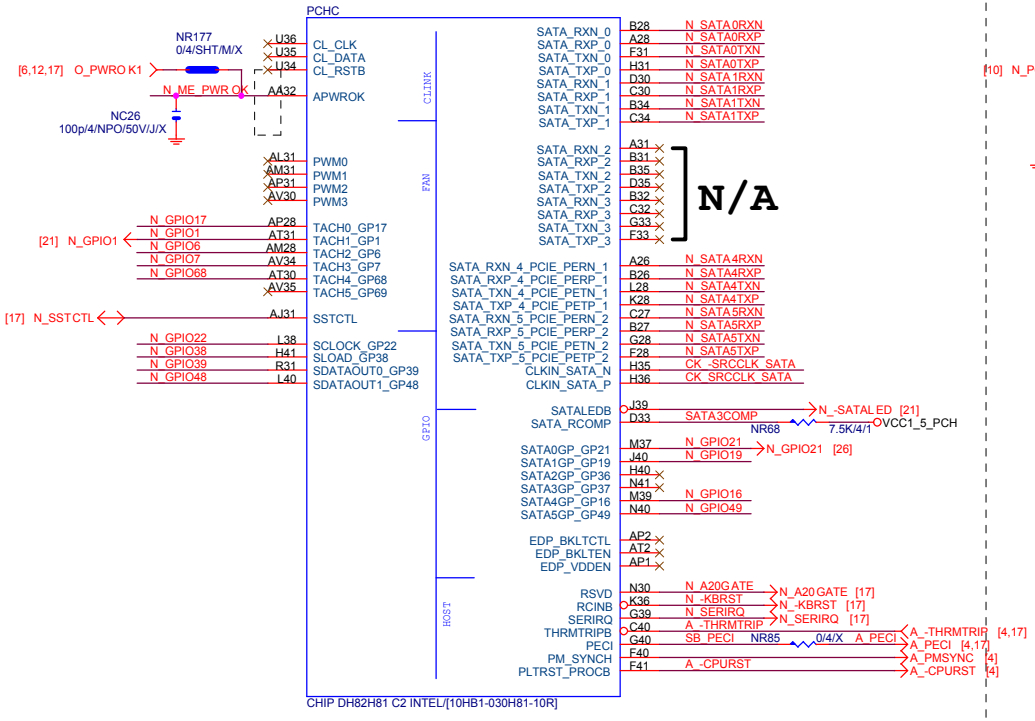
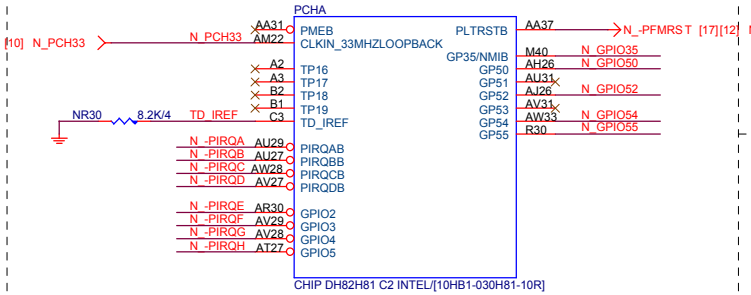
PCH (C)

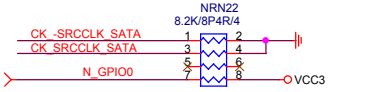
SATA3 : 20/7.5/4.5/7.5/20 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%
SATA2 : 15/7.5/4.5/7.5/15 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%



PCH (A)

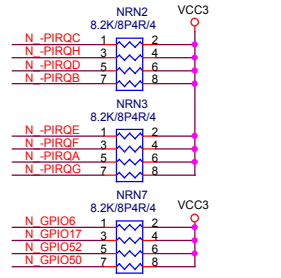


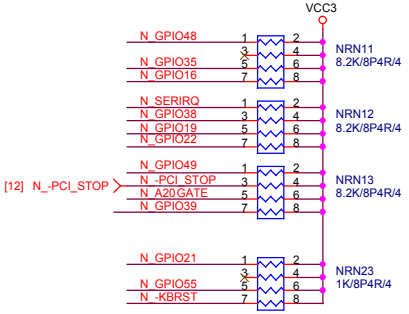
PCH CLK PD

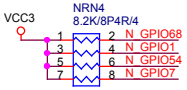


Mount for integrated clock Generation Mode

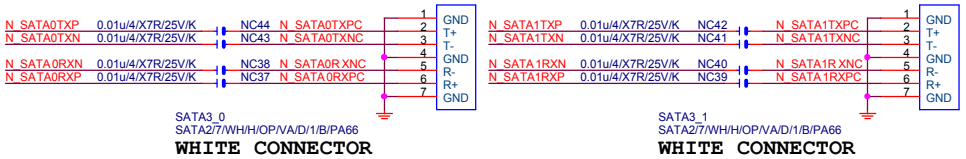
PCH PU/PD



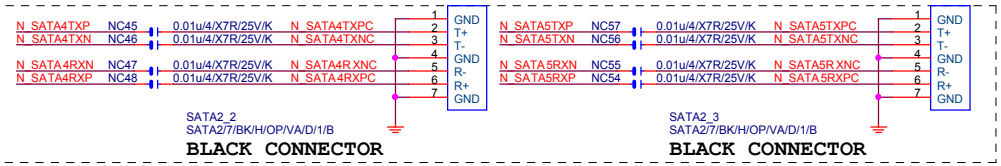




SATA CONNECTOR

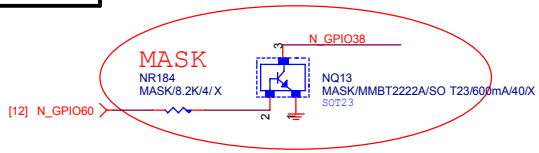


** Z87/H87 Port 4&5 SATA3.0
** B85 Port 4&5 SATA2.0



GPIO38 Ctrl

N/A



Gigabyte Technology

Title	PCH HOST , SATA, PCI	
Size: Custom	Document Number: GA-H81M-S2PV	Rev: 2.0
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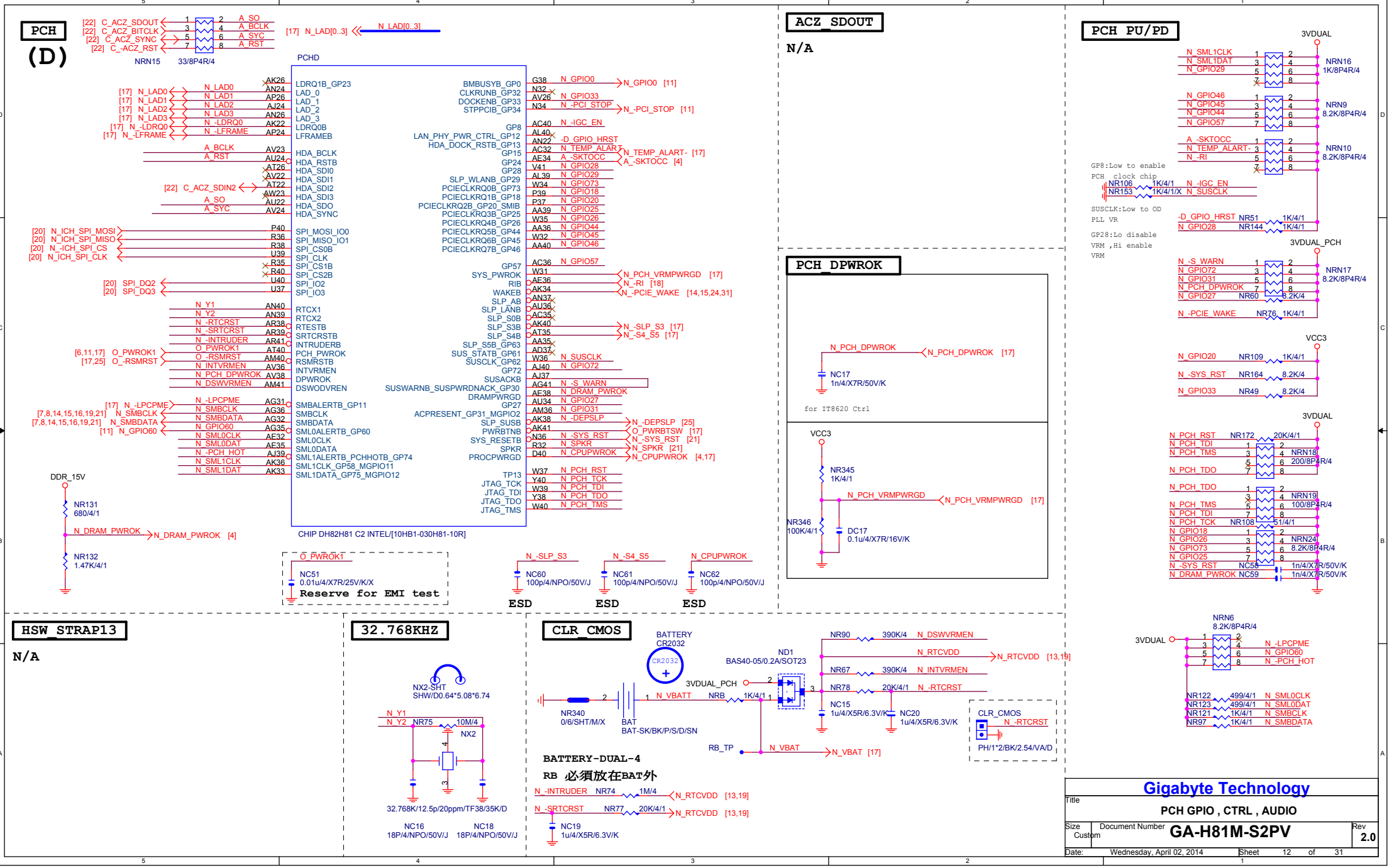
PCH
(D)
PCHD
CHIP DH82H81 C2 INTEL/[10HB1-030H81-10R]
ACZ_SDOUT
N/A
PCH_DPWROK
for IT8620 Ctrl
PCH PU/PD
3VDUAL
3VDUAL_PCH
VCC3
DDR_15V
Reserve for EMI test
ESD
HSW_STRAP13
N/A
32.768KHZ
CLR_CMOS
BATTERY
CR2032
BAS40-05/0.2A/SOT23
BATTERY-DUAL-4
RB 必須放在BAT外
Gigabyte Technology
PCH GPIO , CTRL , AUDIO
GA-H81M-S2PV
Rev 2.0
Wednesday, April 02, 2014
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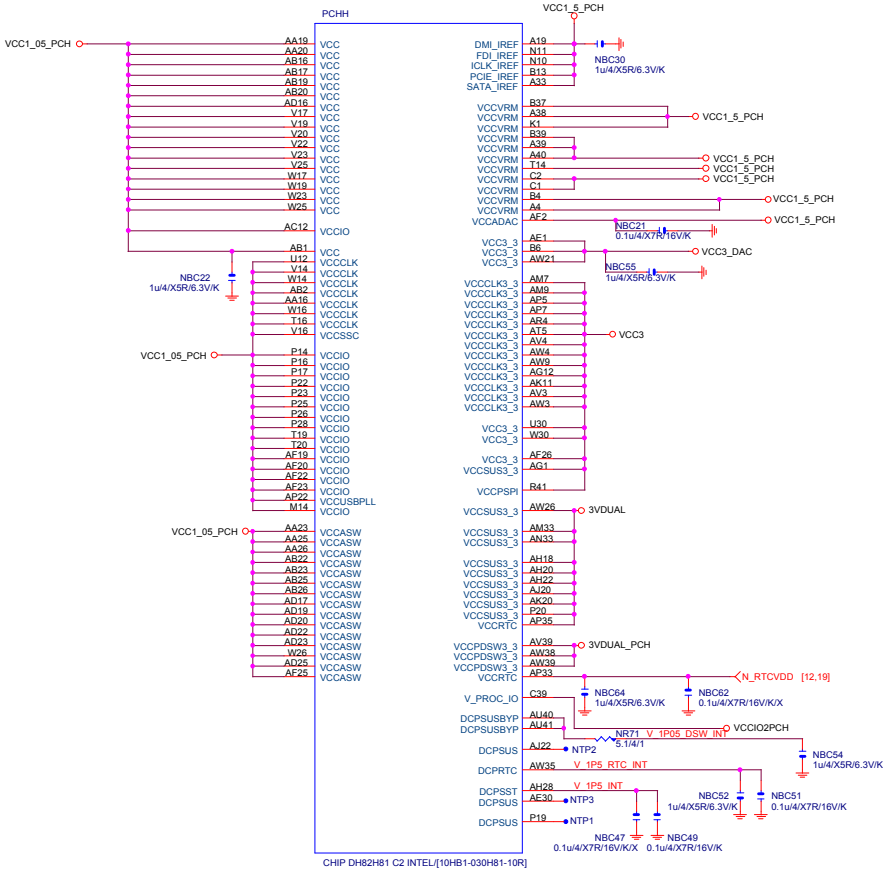
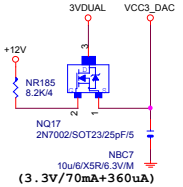
PCH (H)

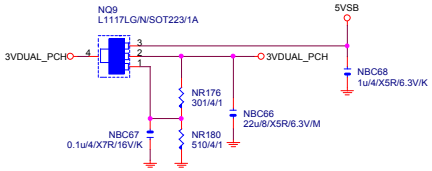


VCC3_DAC

CLOSE北橋(注意震盪水波紋)

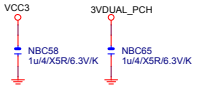


3VDUAL_PCH

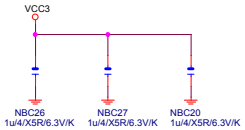


SHT PWR

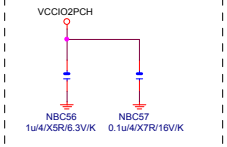
CAP



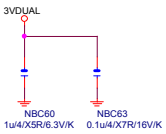
(3.3V) (X6)



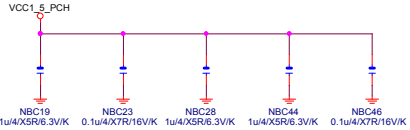
(1.05V)(X2)



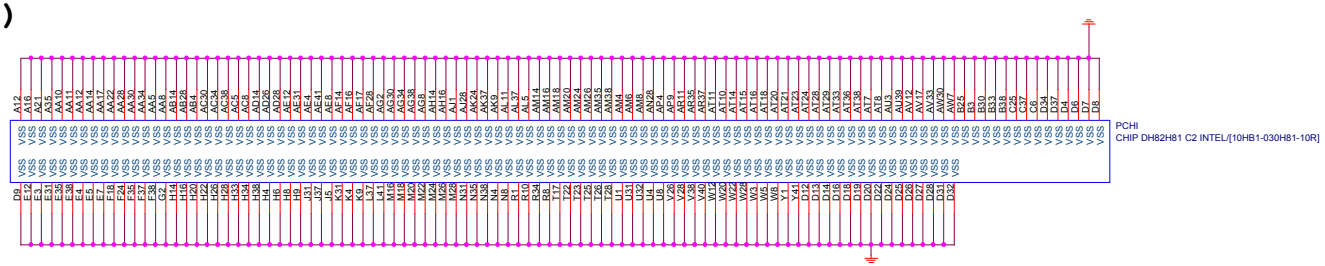
(3.3V) (X2)



(1.5V) (X5)



PCH (I)



Gigabyte Technology			
Title: PCH PWR ,GND			
Size: Custom	Document Number: GA-H81M-S2PV		Rev: 2.0
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PCIEX16 CAP

N/A

VCC3

PABC1 0.1u/4/Y5V/16V/Z/X

PABC2 0.1u/4/Y5V/16V/Z/X

PABC3 0.1u/4/Y5V/16V/Z/X

PCIEX16 PROTECT SHT

+12V

X16_+12V

PARN1 0/8P4R/0402/SHT/X

PARN2 0/8P4R/4/X

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	PAC19	0.22u/4/X5R/6.3V/K	PA_EXP_TXP7_C
PA_EXP_TXN7	PAC18	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_RXP[0..15] >> PA_EXP_RXP[0..15] [4]

PA_EXP_RXN[0..15] >> PA_EXP_RXN[0..15] [4]

PA_EXP_TXP[0..15] >> PA_EXP_TXP[0..15] [4]

PA_EXP_TXN[0..15] >> PA_EXP_TXN[0..15] [4]

PCIEX16 SLOT

PCIESLOT-164DN-Q-1

3GIO_*16

PCIEX16

		12V	B1	A1	PRSNT1*	
		12V	B2	A2	12V	
		RSVD	B3	A3	12V	
PAR3 0/4/SHT/M/X		GND	B4	A4	GND	PAR1 0/4/SHT/M/X
[7,8,12,15,16,19,21] N_SMBCLK	SMBCLK	SMCLK	B5	A5	JTAG2	
[7,8,12,15,16,19,21] N_SMBDATA	SMBDATA	SMDAT	B6	A6	JTAG3	
		GND	B7	A7	JTAG4	
3VDUAL	VCC3	3.3V	B8	A8	JTAG5	PAR2 0/4/SHT/M/X
		JTAG1	B9	A9	3.3V	VCC3
		3.3VAUX	B10	A10	3.3V	
[12,15,24,31] N_-PCIE_WAKE		WAKE*	B11	A11	PWRGD	-PCIE_RST [15,17,31]
		KEY				
		RSVD	B12	A12	GND	
		GND	B13	A13	REFCLK+	PA_SRCCLK_3GIO [10]
PA_EXP_TXP0_C		HSOP0	B14	A14	REFCLK-	PA_-SRCCLK_3GIO [10]
PA_EXP_TXN0_C		HSON0	B15	A15	GND	
		GND	B16	A16	HSIP0	PA_EXP_RXP0
		PRSNT2*	B17	A17	HSIN0	PA_EXP_RXN0
		GND	B18	A18	GND	
PA_EXP_TXP1_C		HSOP1	B19	A19	RSVD	
PA_EXP_TXN1_C		HSON1	B20	A20	GND	
		GND	B21	A21	HSIP1	PA_EXP_RXP1
		GND	B22	A22	HSIN1	PA_EXP_RXN1
PA_EXP_TXP2_C		HSOP2	B23	A23	GND	
PA_EXP_TXN2_C		HSON2	B24	A24	GND	
		GND	B25	A25	HSIP2	PA_EXP_RXP2
		GND	B26	A26	HSIN2	PA_EXP_RXN2
PA_EXP_TXP3_C		HSOP3	B27	A27	GND	
PA_EXP_TXN3_C		HSON3	B28	A28	GND	
		GND	B29	A29	HSIP3	PA_EXP_RXP3
		RSVD	B30	A30	HSIN3	PA_EXP_RXN3
		PRSNT2*	B31	A31	GND	
		GND	B32	A32	RSVD	
PA_EXP_TXP4_C		HSOP4	B33	A33	RSVD	
PA_EXP_TXN4_C		HSON4	B34	A34	GND	
		GND	B35	A35	HSIP4	PA_EXP_RXP4
		GND	B36	A36	HSIN4	PA_EXP_RXN4
PA_EXP_TXP5_C		HSOP5	B37	A37	GND	
PA_EXP_TXN5_C		HSON5	B38	A38	GND	
		GND	B39	A39	HSIP5	PA_EXP_RXP5
		GND	B40	A40	HSIN5	PA_EXP_RXN5
PA_EXP_TXP6_C		HSOP6	B41	A41	GND	
PA_EXP_TXN6_C		HSON6	B42	A42	GND	
		GND	B43	A43	HSIP6	PA_EXP_RXP6
		GND	B44	A44	HSIN6	PA_EXP_RXN6
PA_EXP_TXP7_C		HSOP7	B45	A45	GND	
PA_EXP_TXN7_C		HSON7	B46	A46	GND	
		GND	B47	A47	HSIP7	PA_EXP_RXP7
		PRSNT2*	B48	A48	HSIN7	PA_EXP_RXN7
		GND	B49	A49	GND	
PA_EXP_TXP8_C		HSOP8	B50	A50	RSVD	
PA_EXP_TXN8_C		HSON8	B51	A51	GND	
		GND	B52	A52	HSIP8	PA_EXP_RXP8
		GND	B53	A53	HSIN8	PA_EXP_RXN8
PA_EXP_TXP9_C		HSOP9	B54	A54	GND	
PA_EXP_TXN9_C		HSON9	B55	A55	GND	
		GND	B56	A56	HSIP9	PA_EXP_RXP9
		GND	B57	A57	HSIN9	PA_EXP_RXN9
PA_EXP_TXP10_C		HSOP10	B58	A58	GND	
PA_EXP_TXN10_C		HSON10	B59	A59	GND	
		GND	B60	A60	HSIP10	PA_EXP_RXP10
		GND	B61	A61	HSIN10	PA_EXP_RXN10
PA_EXP_TXP11_C		HSOP11	B62	A62	GND	
PA_EXP_TXN11_C		HSON11	B63	A63	GND	
		GND	B64	A64	HSIP11	PA_EXP_RXP11
		GND	B65	A65	HSIN11	PA_EXP_RXN11
PA_EXP_TXP12_C		HSOP12	B66	A66	GND	
PA_EXP_TXN12_C		HSON12	B67	A67	GND	
		GND	B68	A68	HSIP12	PA_EXP_RXP12
		GND	B69	A69	HSIN12	PA_EXP_RXN12
PA_EXP_TXP13_C		HSOP13	B70	A70	GND	
PA_EXP_TXN13_C		HSON13	B71	A71	GND	
		GND	B72	A72	HSIP13	PA_EXP_RXP13
		GND	B73	A73	HSIN13	PA_EXP_RXN13
PA_EXP_TXP14_C		HSOP14	B74	A74	GND	
PA_EXP_TXN14_C		HSON14	B75	A75	GND	
		GND	B76	A76	HSIP14	PA_EXP_RXP14
		GND	B77	A77	HSIN14	PA_EXP_RXN14
PA_EXP_TXP15_C		HSOP15	B78	A78	GND	
PA_EXP_TXN15_C		HSON15	B79	A79	GND	
		GND	B80	A80	HSIP15	PA_EXP_RXP15
		PRSNT2*	B81	A81	HSIN15	PA_EXP_RXN15
		RSVD	B82	A82	GND	

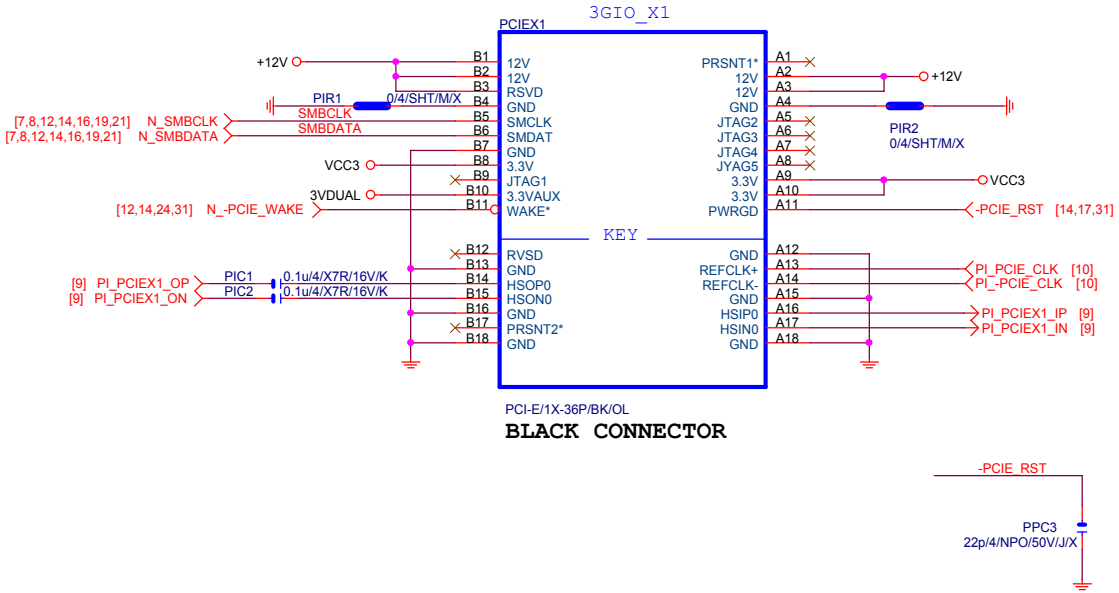
-PCIE_RST >> PAC1 22p/4/NPO/50V/J/X

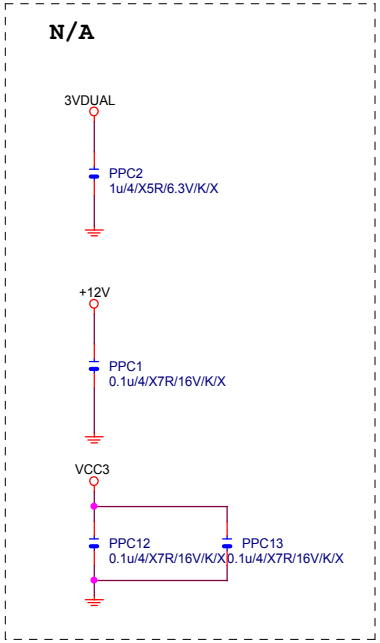
PCI-E/16X-164P/BK/LONG DOUBLE

BLACK CONNECTOR

Gigabyte Technology		
Title: PCI EXPRESS * 16		
Size: Custom	Document Number: GA-H81M-S2PV	Rev: 2.0
Date: Wednesday, April 09, 2014	Sheet 14 of 31	

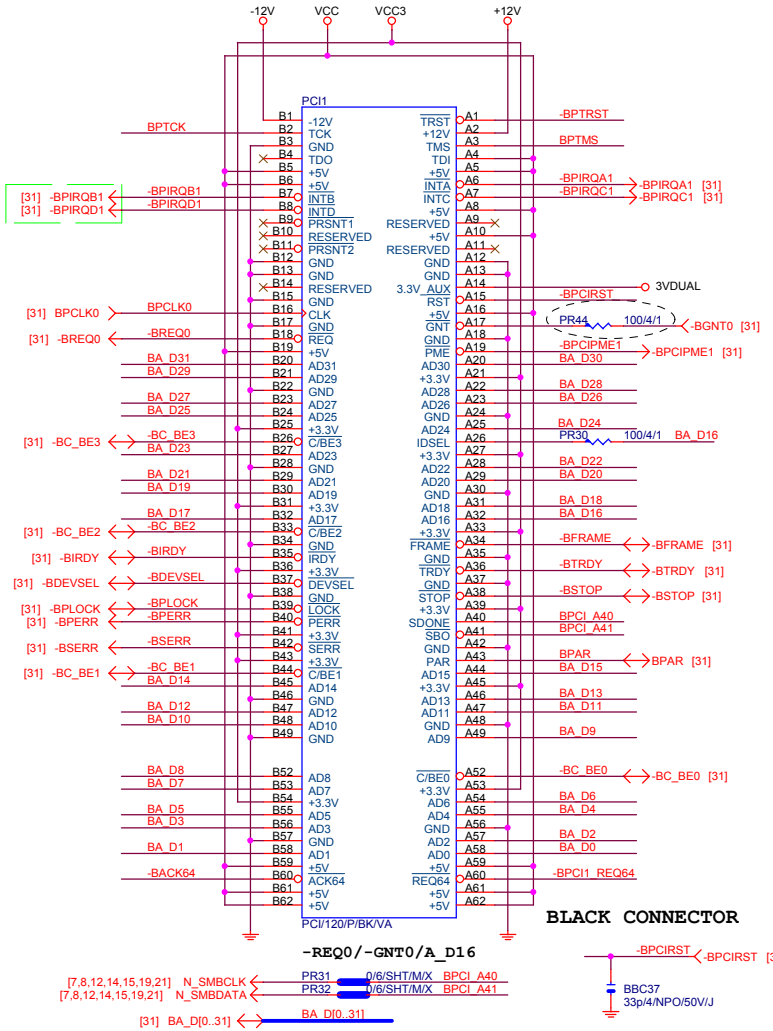
PCIEX1 SLOT



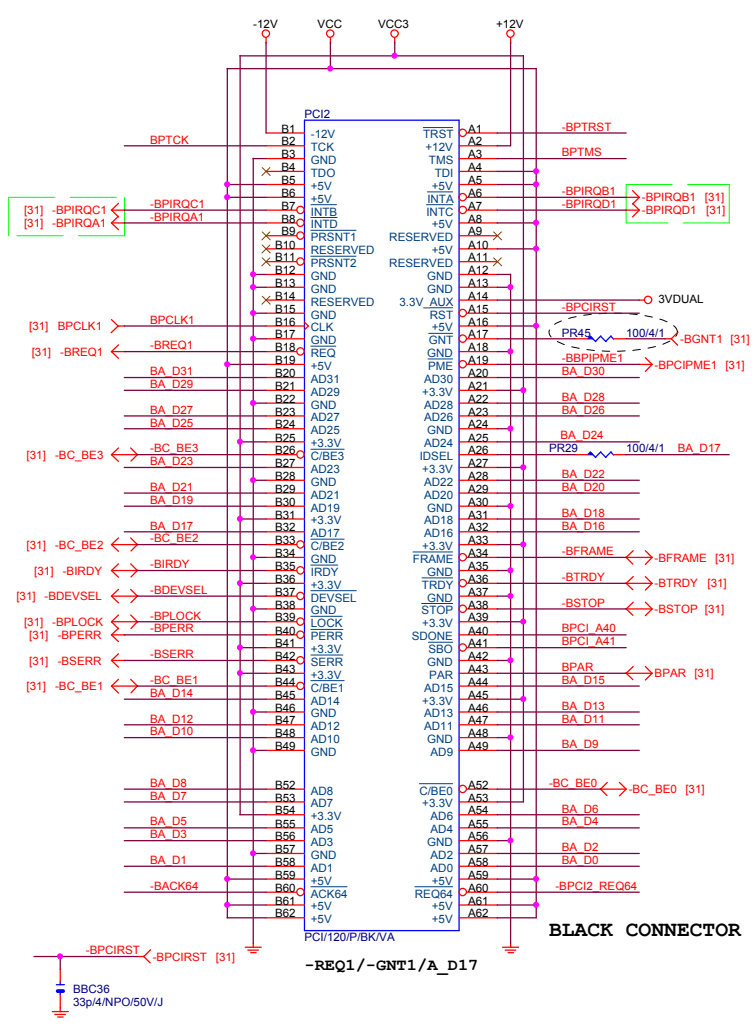


Gigabyte Technology		
Title: PCI EXPRESS X 1 PORT		
Size: Custom	Document Number: GA-H81M-S2PV	Rev: 2.0
Date: Wednesday, April 09, 2014	Sheet 15 of 31	

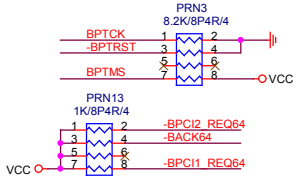
PCI SLOT 1



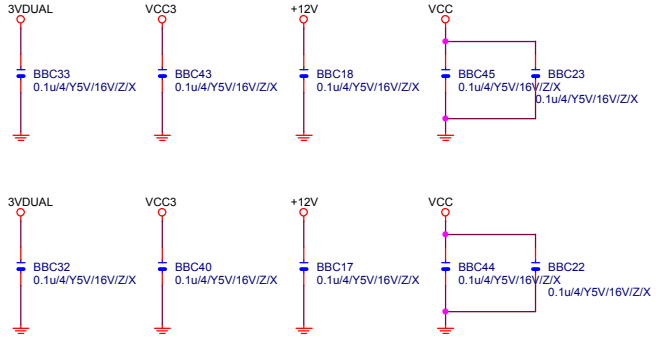
PCI SLOT 2



PCI PU



PCI CAP N/A

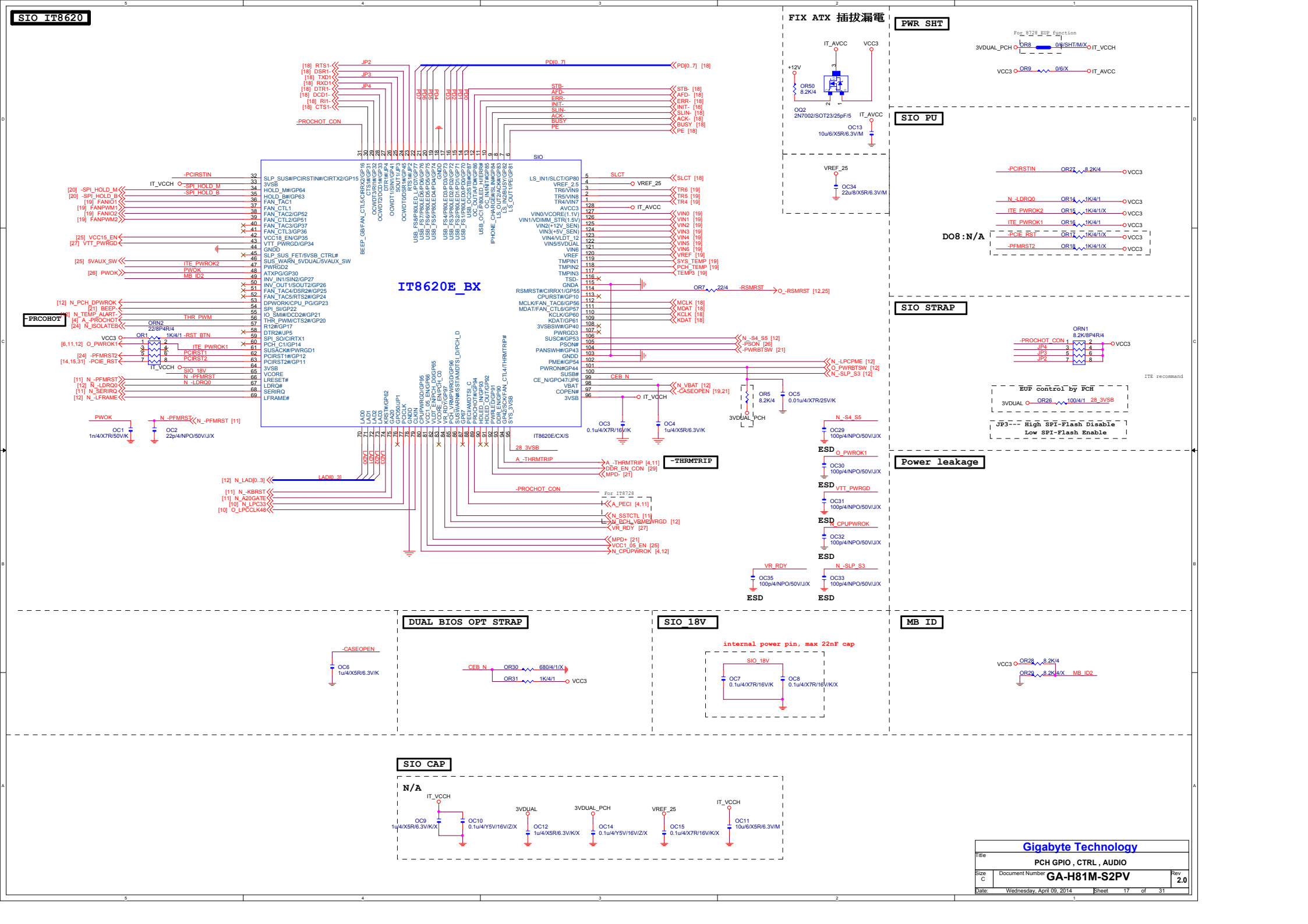


Gigabyte Technology

Title: PCI SLOT 1&2

Size: Custom | Document Number: GA-H81M-S2PV | Rev: 2.0

Date: Wednesday, April 09, 2014 | Sheet 16 of 31


SIO IT8620
IT8620E_BX
SIO
IT8620E/CX/S
FIX ATX 插拔漏電
PWR SHT
SIO PU
SIO STRAP
Power leakage
DUAL BIOS OPT STRAP
SIO_18V
MB ID
SIO CAP
-PROCHOT
-THRMTRIP
DO8:N/A
ESD
N/A
Gigabyte Technology
PCH GPIO , CTRL , AUDIO
GA-H81M-S2PV
Rev 2.0
Wednesday, April 09, 2014
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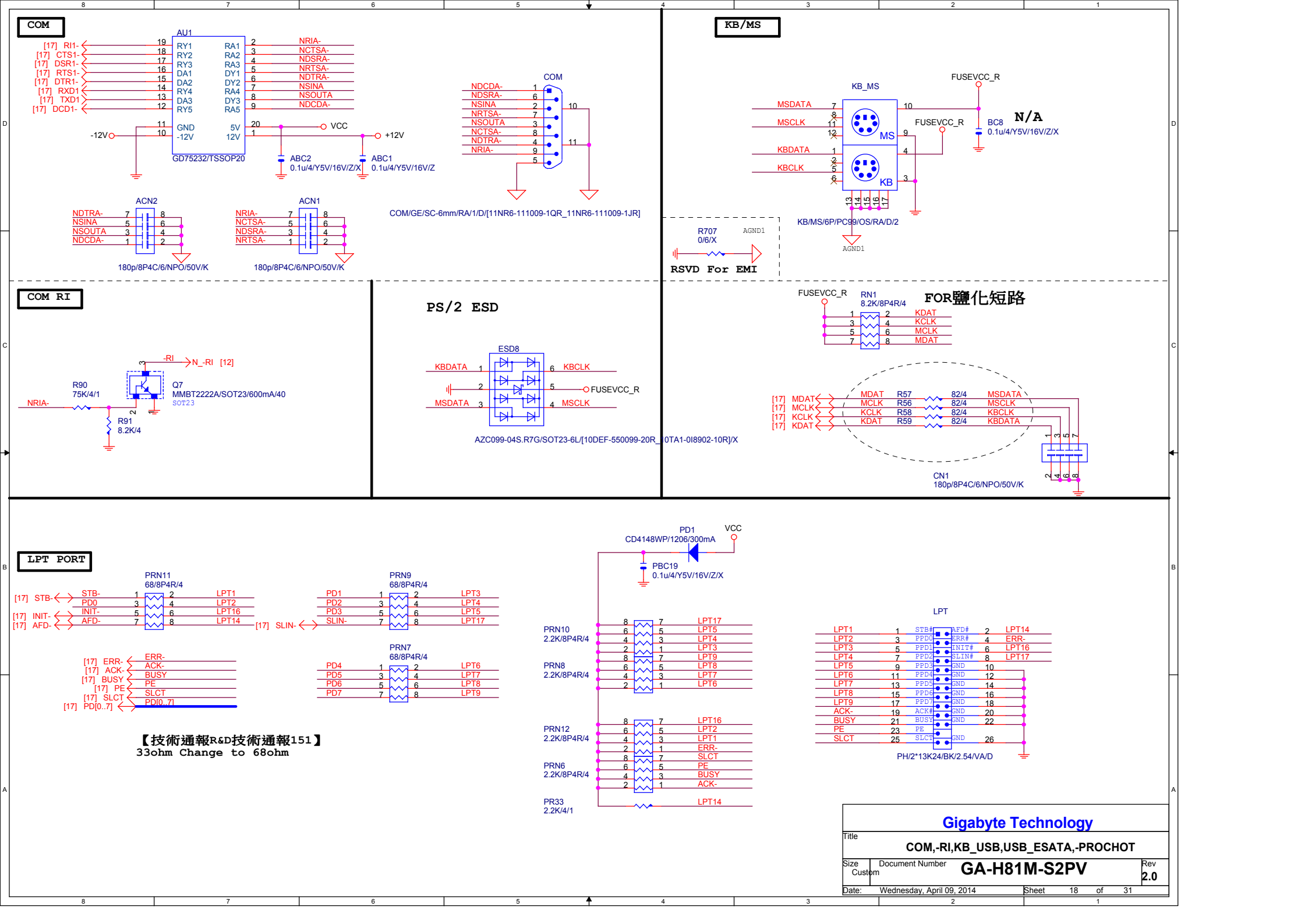
COM
AU1
[17] RI1-
[17] CTS1-
[17] DSR1-
[17] RTS1-
[17] DTR1-
[17] RXD1
[17] TXD1
[17] DCD1-
RY1
RY2
RY3
DA1
DA2
RY4
DA3
RY5
RA1
RA2
RA3
DY1
DY2
RA4
DY3
RA5
NRIA-
NCTSA-
NDSRA-
NRTSA-
NDTRA-
NSINA
NSOUTA
NDCDA-
GND
-12V
5V
12V
-12V
VCC
+12V
GD75232/TSSOP20
ABC2
0.1u/4/Y5V/16V/Z/X
ABC1
0.1u/4/Y5V/16V/Z
COM
COM/GE/SC-6mm/RA/1/D/[11NR6-111009-1QR_11NR6-111009-1JR]
ACN2
ACN1
180p/8P4C/6/NPO/50V/K
180p/8P4C/6/NPO/50V/K
KB/MS
KB_MS
MSDATA
MSCLK
KBDATA
KBCLK
MS
KB
FUSEVCC_R
BC8
N/A
0.1u/4/Y5V/16V/Z/X
KB/MS/6P/PC99/OS/RA/D/2
AGND1
R707
0/6/X
RSVD For EMI
COM RI
-RI
N_-RI [12]
R90
75K/4/1
Q7
MMBT2222A/SOT23/600mA/40
SOT23
R91
8.2K/4
PS/2 ESD
ESD8
AZC099-04S.R7G/SOT23-6L/[10DEF-550099-20R_10TA1-0I8902-10R]/X
FOR鹽化短路
RN1
8.2K/8P4R/4
KDAT
KCLK
MCLK
MDAT
R57
R56
R58
R59
82/4
CN1
180p/8P4C/6/NPO/50V/K
LPT PORT
PRN11
68/8P4R/4
PRN9
68/8P4R/4
PRN7
68/8P4R/4
STB-
PD0
INIT-
AFD-
PD1
PD2
PD3
SLIN-
PD4
PD5
PD6
PD7
ERR-
ACK-
BUSY
PE
SLCT
PD[0..7]
PD1
CD4148WP/1206/300mA
VCC
PBC19
0.1u/4/Y5V/16V/Z/X
PRN10
2.2K/8P4R/4
PRN8
2.2K/8P4R/4
PRN12
2.2K/8P4R/4
PRN6
2.2K/8P4R/4
PR33
2.2K/4/1
LPT
PH/2*13K24/BK/2.54/VA/D
【技術通報R&D技術通報151】
33ohm Change to 68ohm
Gigabyte Technology
Title
COM,-RI,KB_USB,USB_ESATA,-PROCHOT
Size
Custom
Document Number
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2.0
Date:
Wednesday, April 09, 2014
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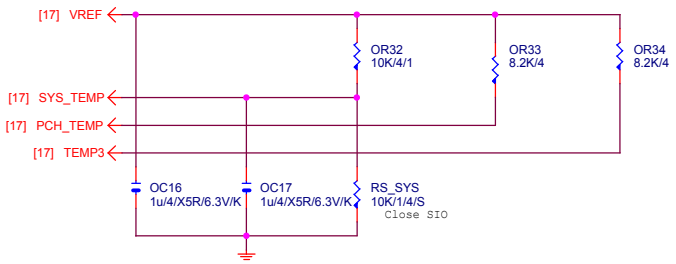
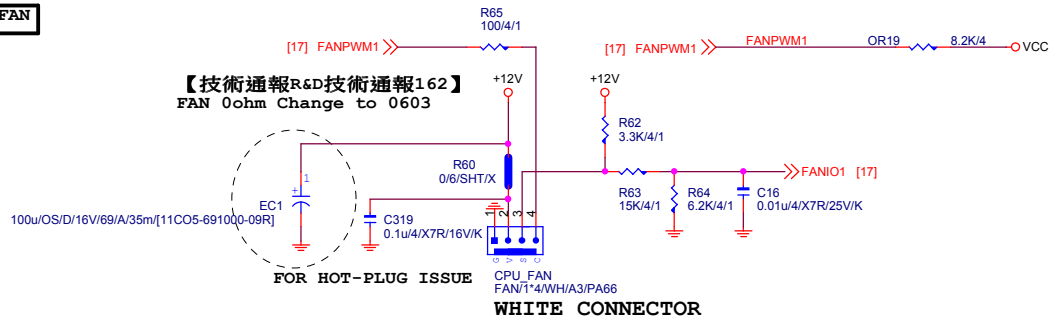
31

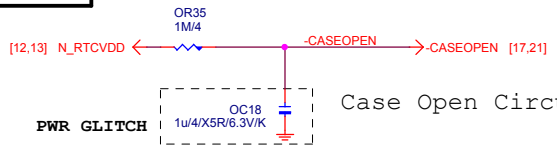
TEMP H/W MONITOR



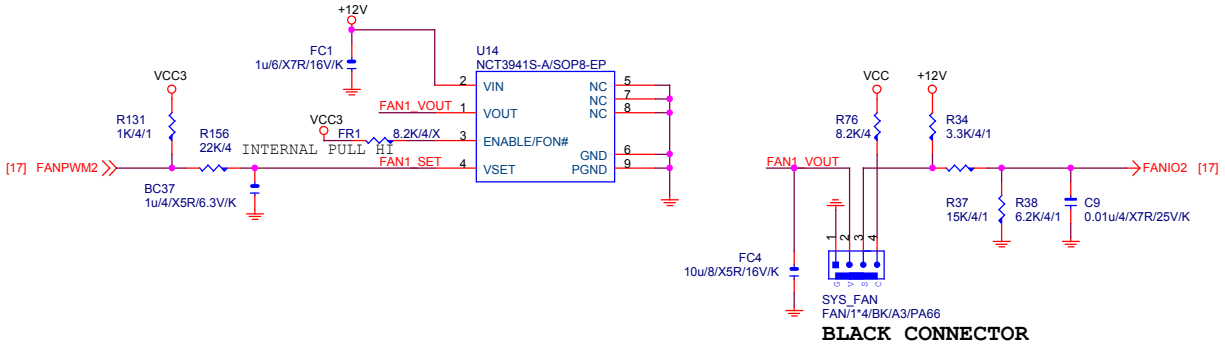
CPU SMART FAN



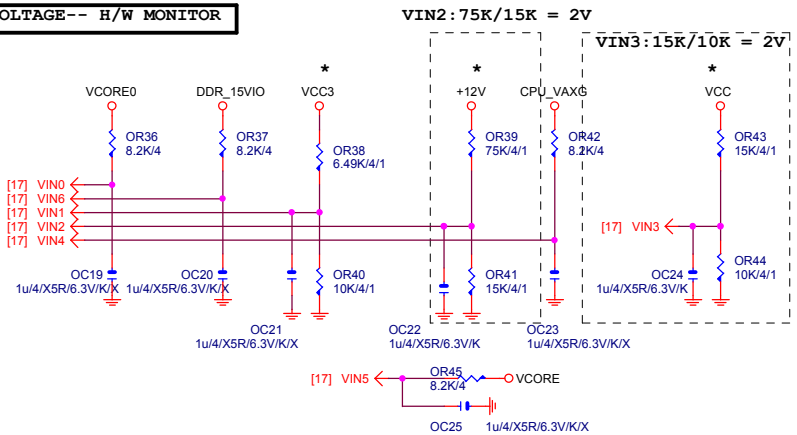
CASE OPEN

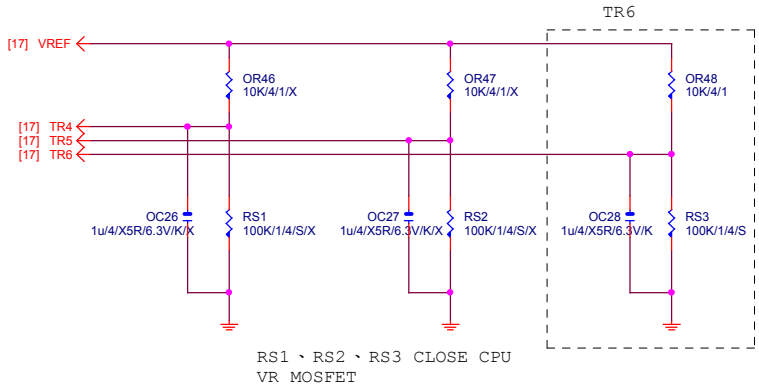


SYS SMART FAN

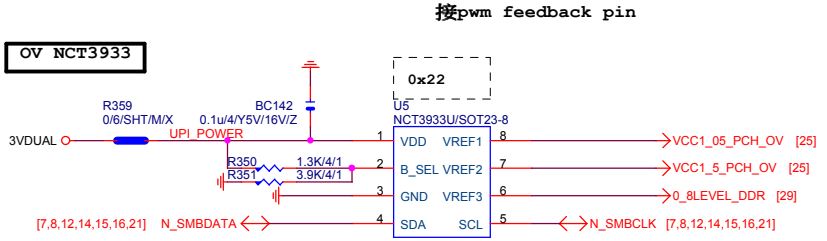


VOLTAGE-- H/W MONITOR





OV NCT3933



Gigabyte Technology

Title	HWM,FAN CTRL,OV	
Size: Custom	Document Number: GA-H81M-S2PV	Rev: 2.0
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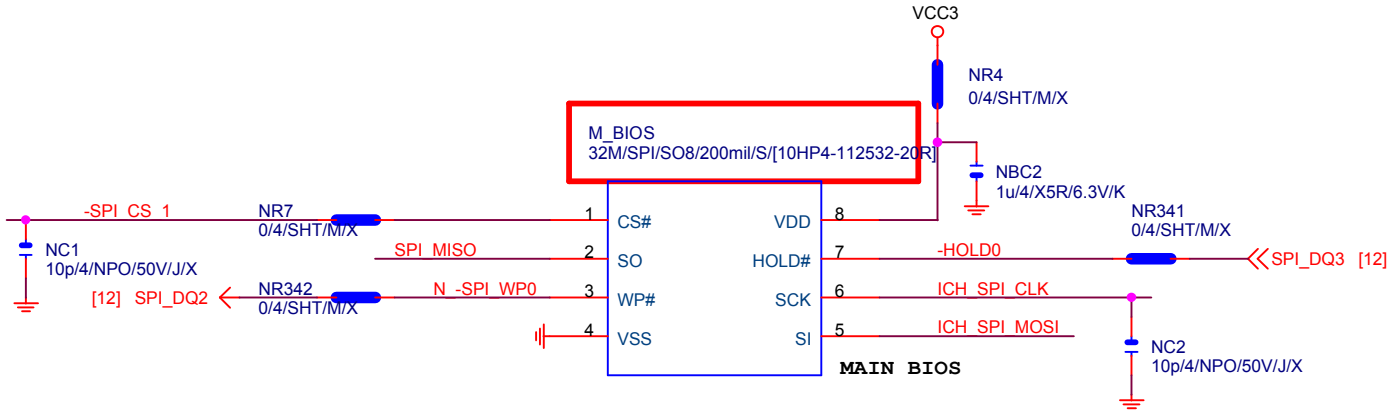
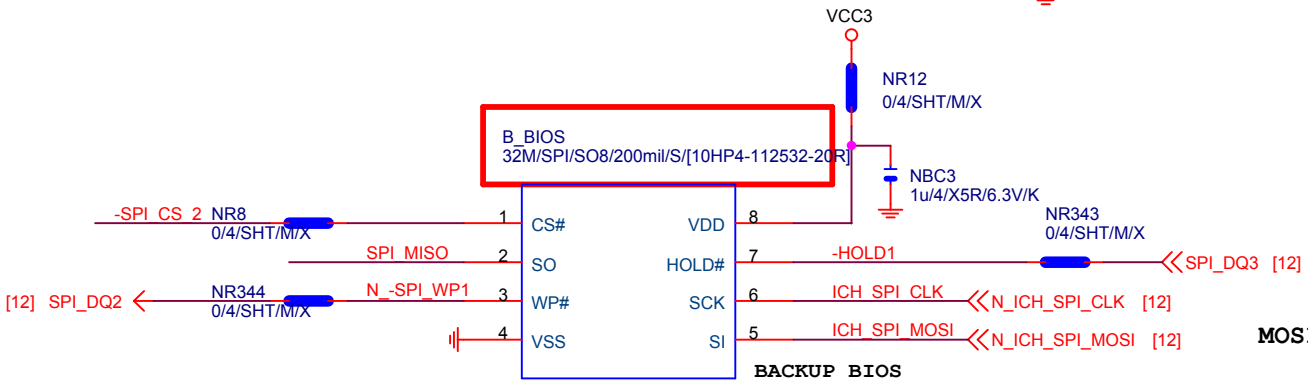
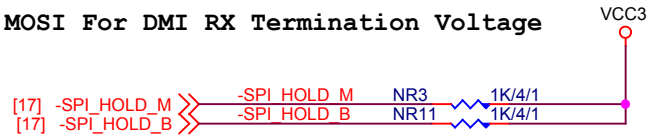


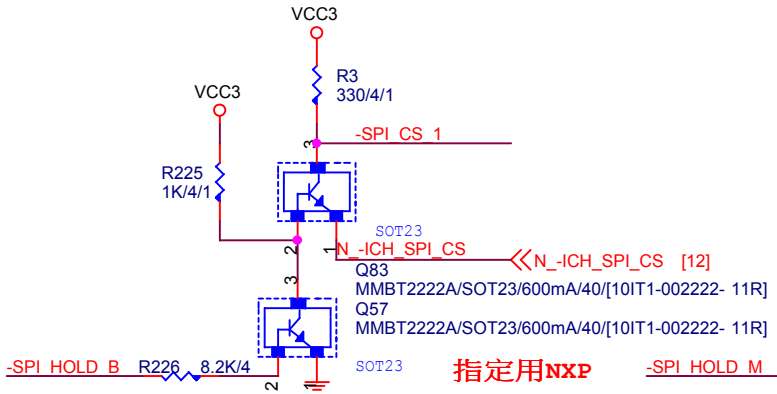


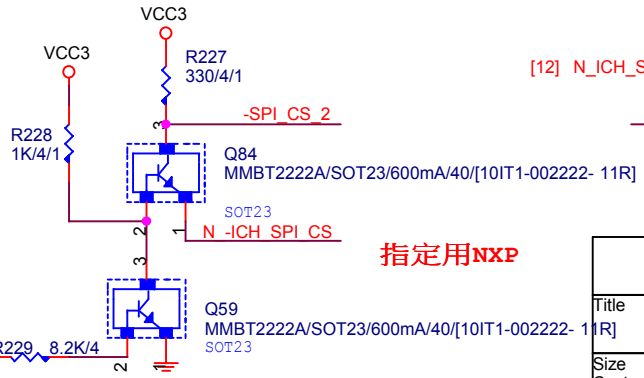
BOOT DEVICE	GNT0	GNT1
LPC	0	0
PCI	0	1
NAND	1	0
SPI	1	1

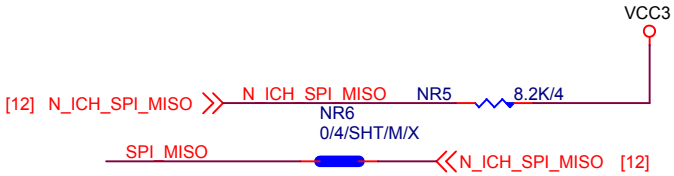
1 means floating
0 means PD 1K

MOSI For DMI RX Termination Voltage









Gigabyte Technology

Title: DUAL BIOS

Size: Custom | Document Number: GA-H81M-S2PV | Rev: 2.0

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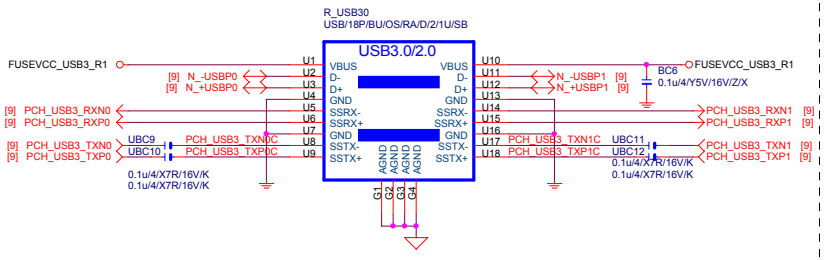
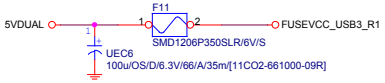
USB30_20



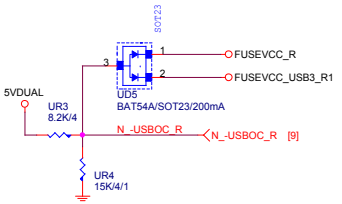
USB30_20 PWR

Polyswitch-1206

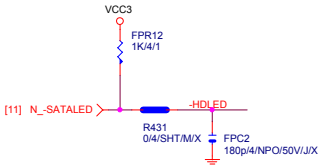


USB3.0 1Port - 1Fuse (3.5A)

-USBOC_R

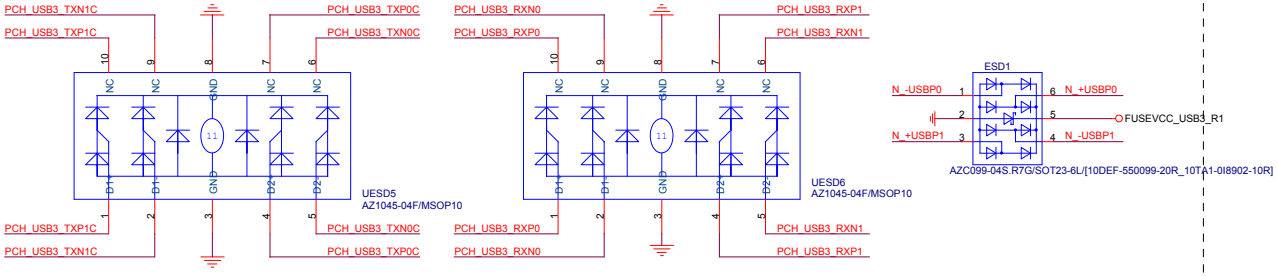


SATA LED

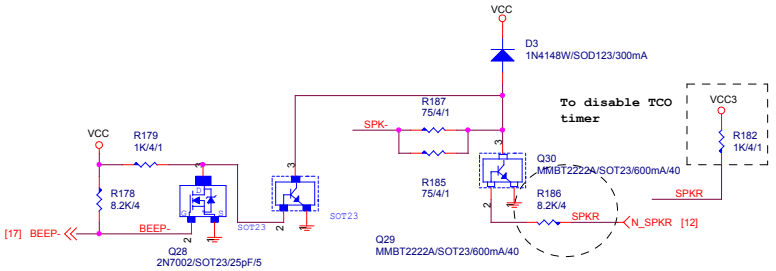


USB30_20 ESD PROCTECT

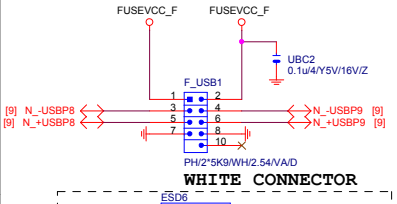
USB3.0 ESD



SPKR



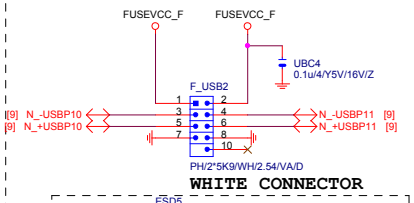
FRONT USB1



WHITE CONNECTOR

Close to connector

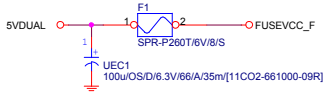
FRONT USB2



WHITE CONNECTOR

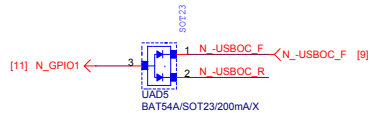
Close to connector

FUSE-0805



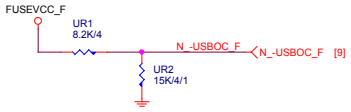
F_USB1, F_USB2 4-Port 2.6A

USB POWER PROTECT

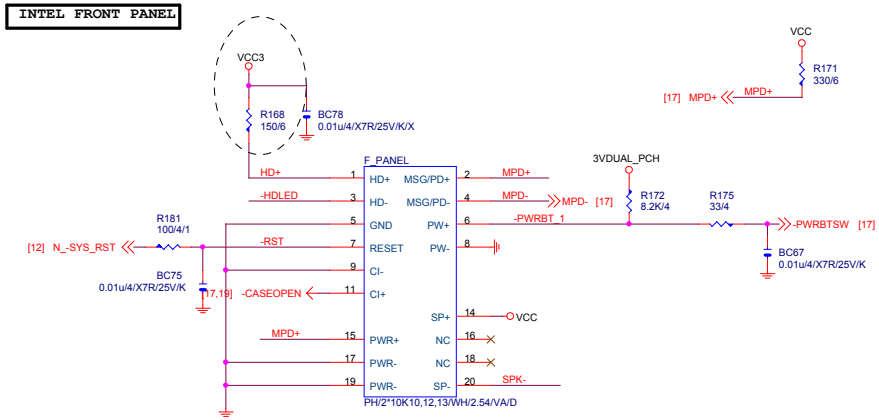


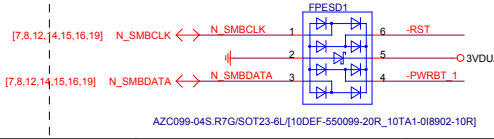
N/A

-USBOC_F



INTEL FRONT PANEL





Gigabyte Technology			
Title: FP,F_USB,USB PWR,SPKR,SATA LED			
Size: Custom	Document Number: GA-H81M-S2PV		Rev: 2.0
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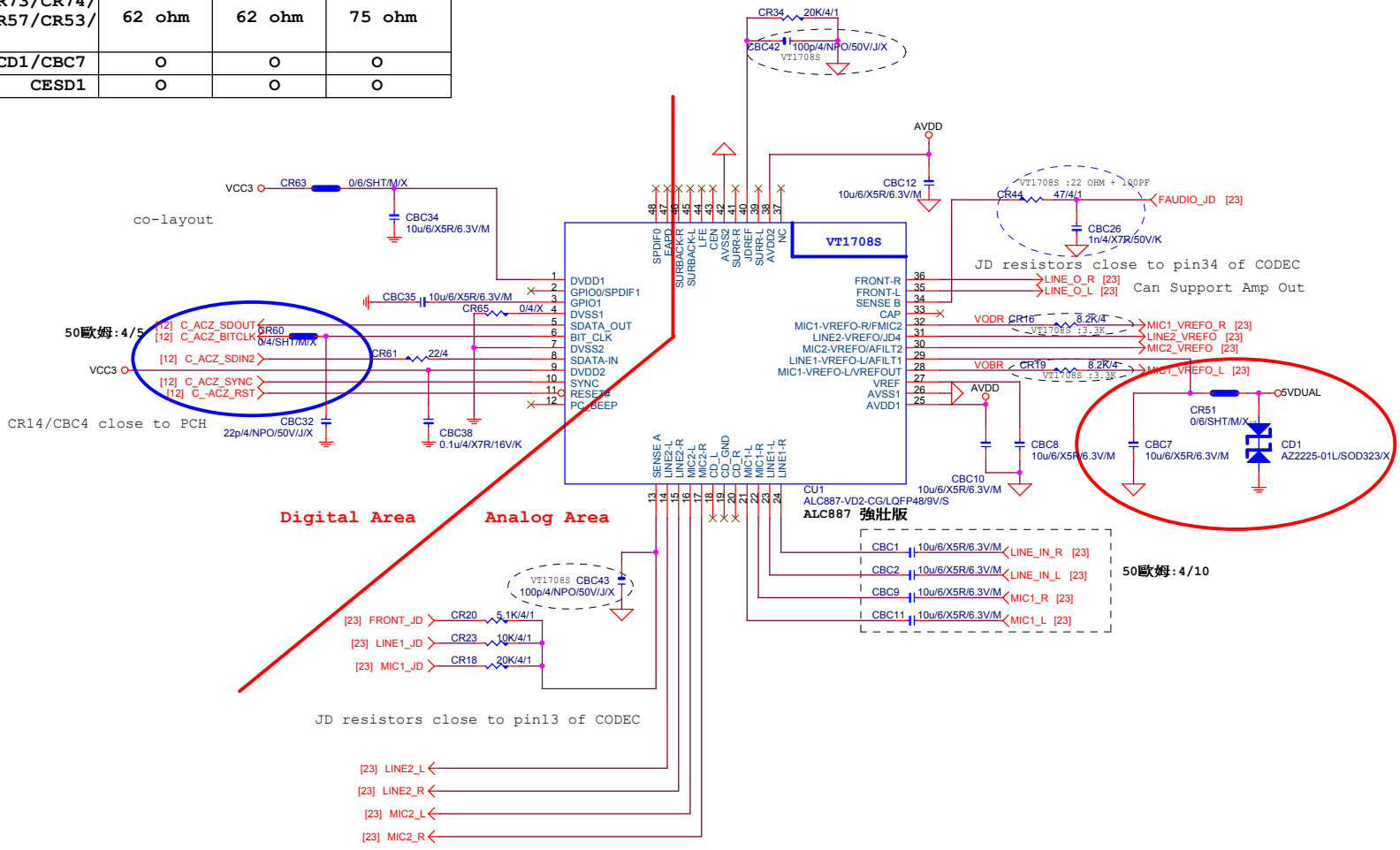
AZALIA CODEC *ALC892/ALC887-VD2/VT1708-CE Colay*

	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



Gigabyte Technology

Title	HD AUDIO ALC887B-VD2/VT1708S/VT2021	
Size: Custom	Document Number: GA-H81M-S2PV	Rev: 2.0
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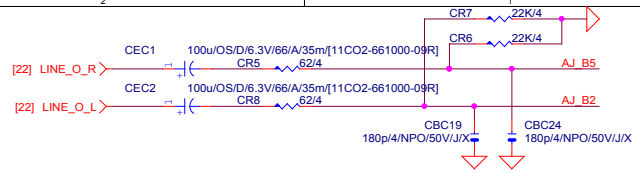
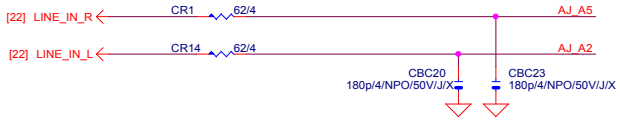
CR49 0/6/SHT/M/X
CR50 0/6/X
CR21 2.2/6
CR24 0/4/SHT/M/X

LINE-OUT



Only reserved for AIC888

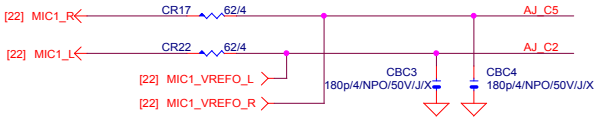
LINE-IN



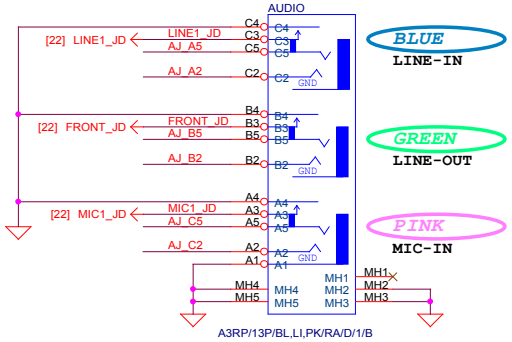
Verify MIC function in LINE-in

For 889A/888

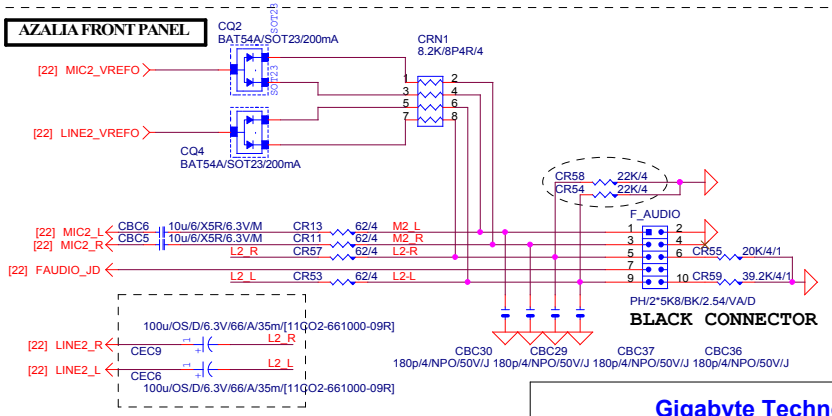
MIC-IN



SPDIF_OUT



AZALIA FRONT PANEL



Gigabyte Technology

Title: AUDIO JACK

Size: Custom | Document Number: GA-H81M-S2PV | Rev: 2.0

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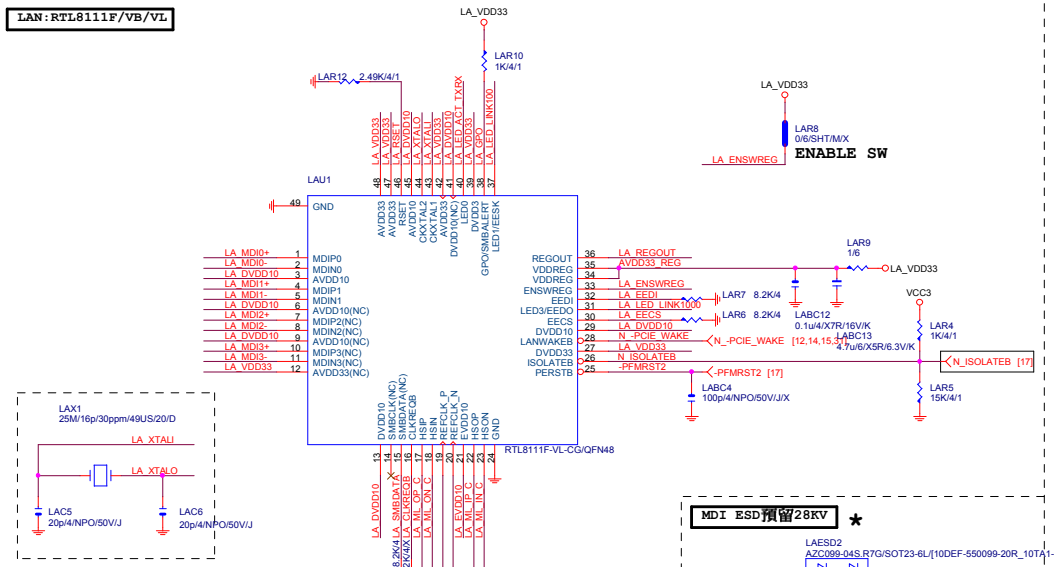
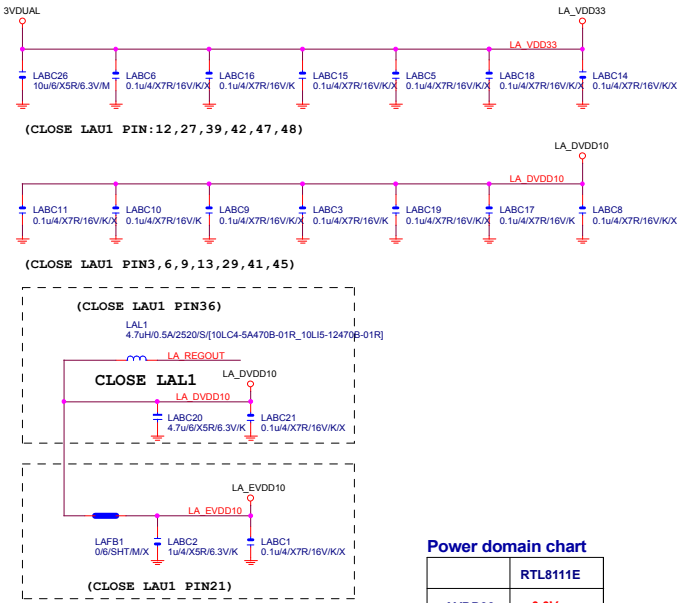
LAN:RTL8111F/VB/VL



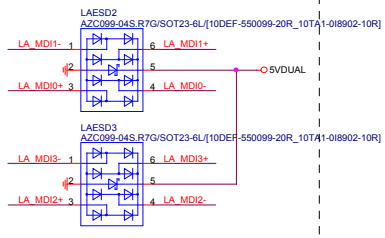
LAN POWER



Power domain chart

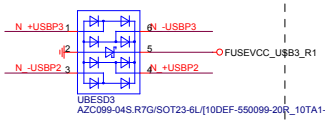
	RTL8111E
AVDD33	3.3V
DVDD33	3.3V
VDDREG	3.3V
DVDD10	1.05V

MDI ESD預留28KV ★



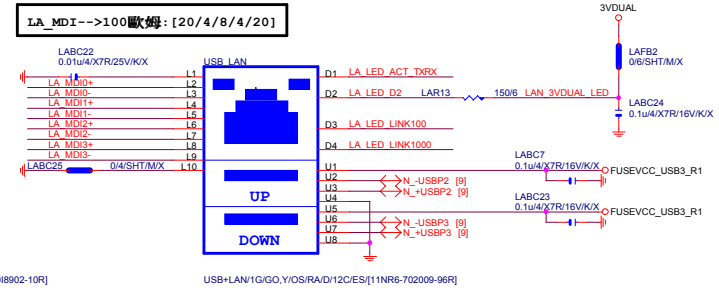
USB_LAN CONNECTOR

RMA ESD PROTECT



★ 使用RU9 USB_LAN可省略LAESD1保護LED

LA_MDI-->100歐姆:[20/4/8/4/20]



USB POWER

FUSE-0805

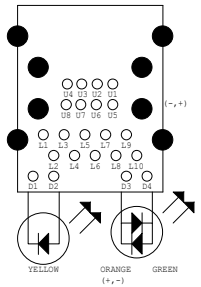
Close to connector

USB_LAN 2-Port 2.0A

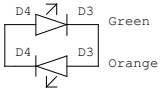
EMI SHORT PAD

PS:視EMI需求

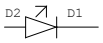
注意:USB PORT(目前:暫代6,7PORT)
USB-->90歐姆:[15/4.5/7.5/4.5/15]



Dual Color LED



Single Color LED



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

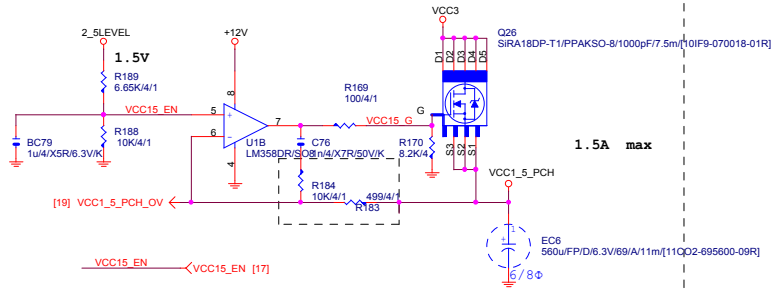
Gigabyte Technology

Title: Realtek RTL8111G

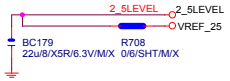
Size: Custom | Document Number: GA-H81M-S2PV | Rev: 2.0

Date: Wednesday, April 09, 2014 | Sheet 24 of 31

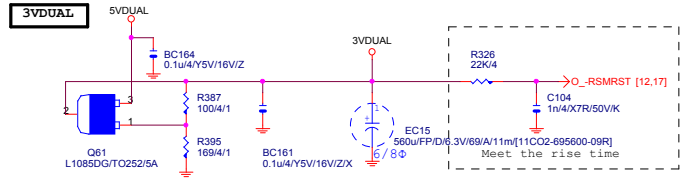
VCC1_5_PCH



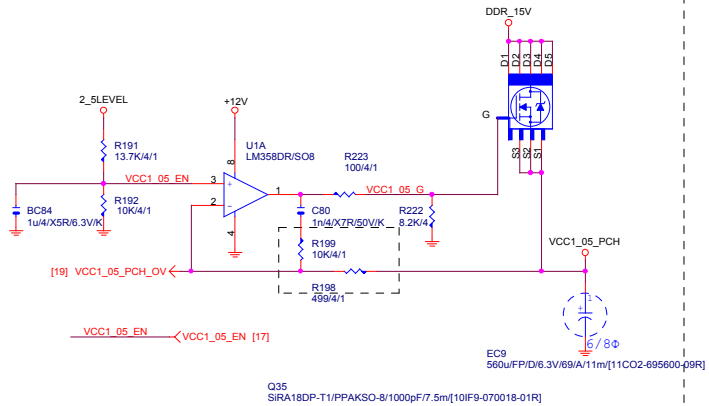
2_5LEVEL



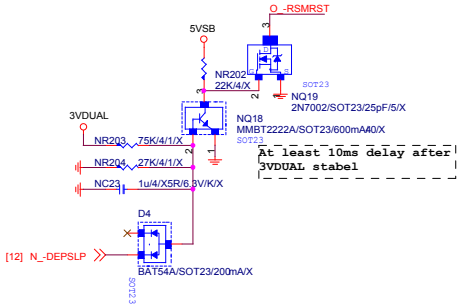
3VDUAL



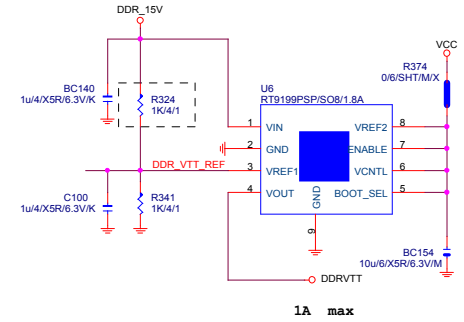
VCC1_05_PCH



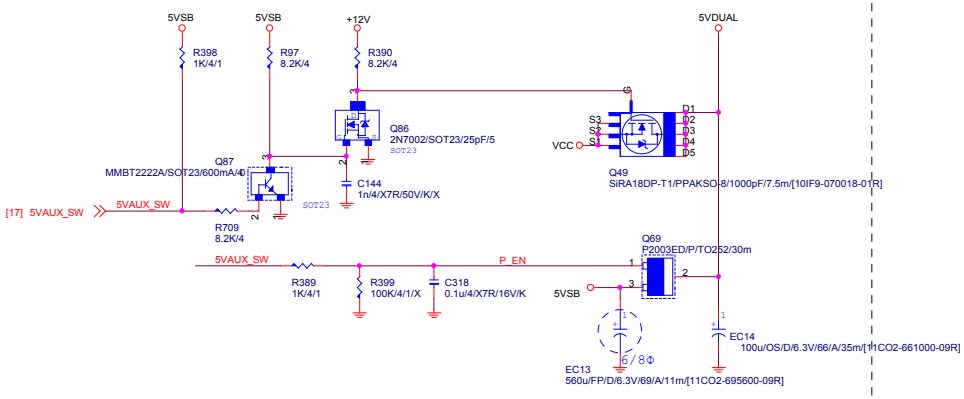
N/A



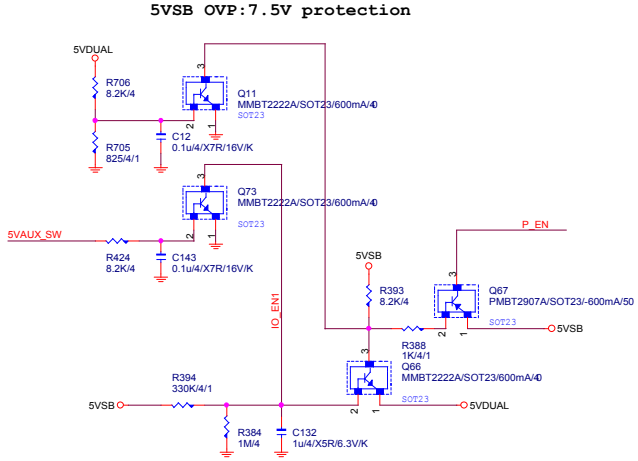
DDRVTT



5VDUAL



5VDUAL SHORT PROTECT



Gigabyte Technology		
Title: DISCRETE POWER		
Size: Custom	Document Number: GA-H81M-S2PV	Rev: 2.0
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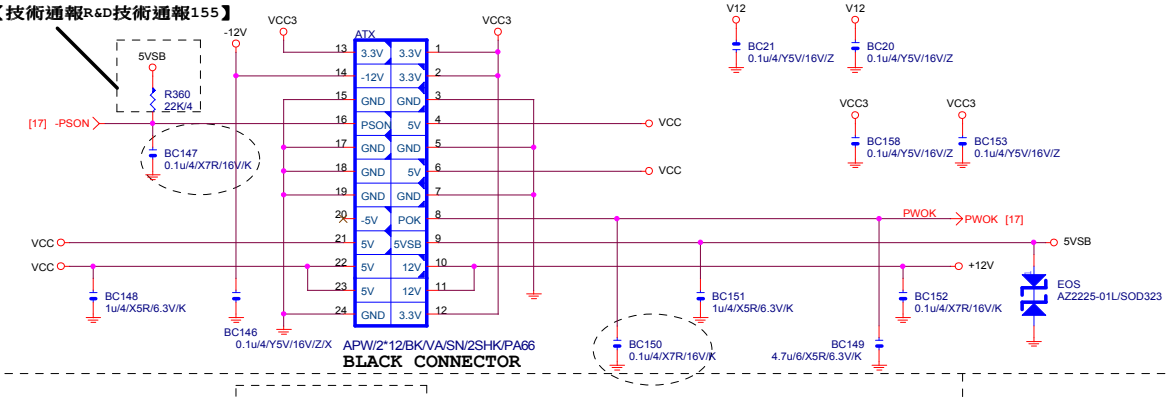
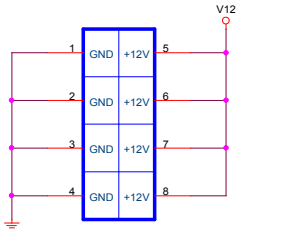
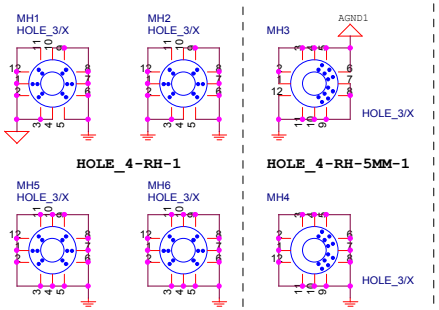
ATXX24 POWER CONNECTOR

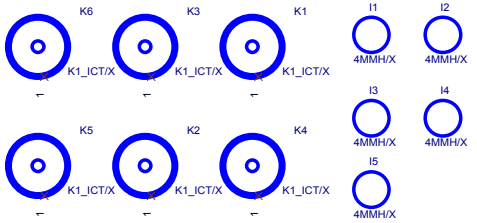
【技術通報R&D技術通報155】



ATXX4 POWER CONNECTOR



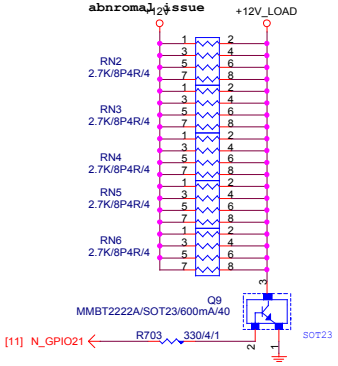




To prevent the 5VSB under loading when boot

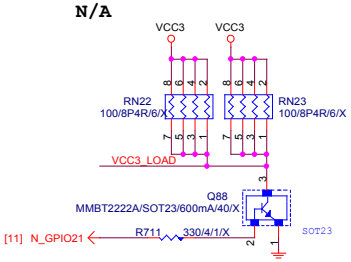
【技術通報R&D技術通報153】

To fix 12V light load abnromal issue



FIX PWR MINMUN LOAD

N/A



Gigabyte Technology		
Title: ATX CONNECTOR		
Size: Custom	Document Number: GA-H81M-S2PV	Rev: 2.0
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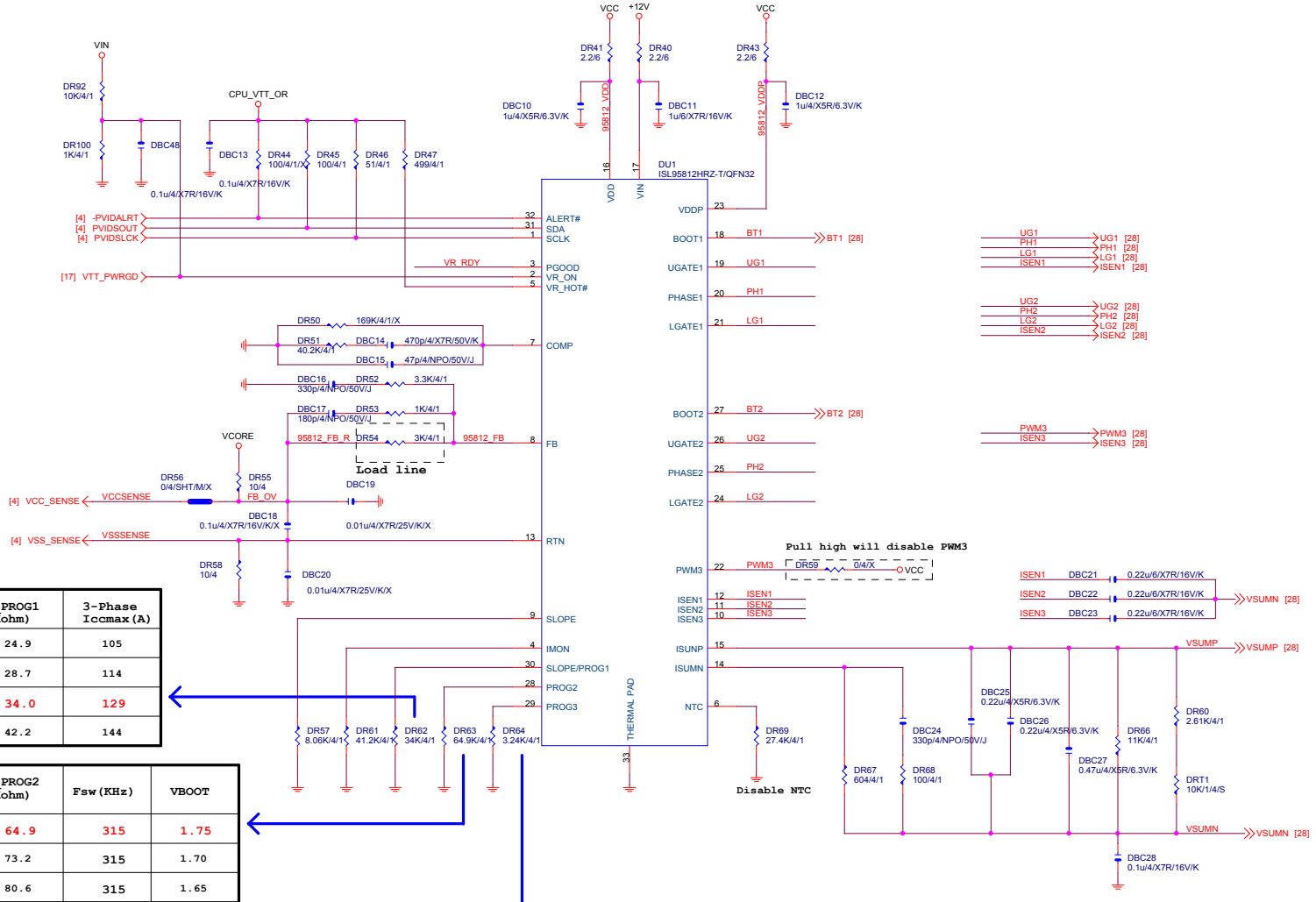


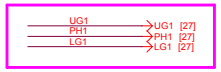
R_PROG1 (Kohm)	3-Phase Iccmax(A)
24.9	105
28.7	114
34.0	129
42.2	144

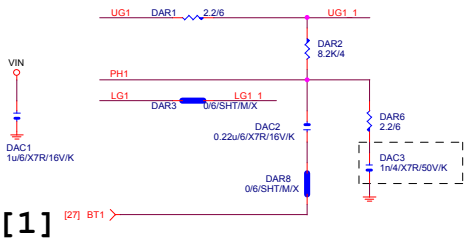
R_PROG2 (Kohm)	Fsw(KHz)	VBOOT
64.9	315	1.75
73.2	315	1.70
80.6	315	1.65
90.9	315	0

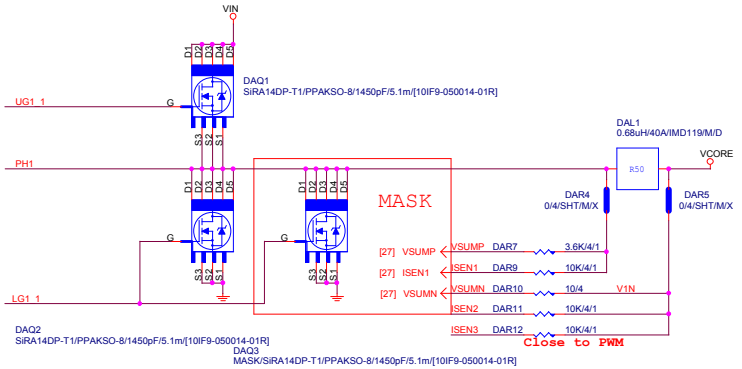
R_PROG3 (Kohm)	Fast Slew Rate (mV/us)
3.24	12
5.76	24
9.31	40
13.3	45

Gigabyte Technology			
Title: CPU CORE VR-1			
Size: Custom	Document Number: GA-H81M-S2PV		Rev: 2.0
Date: Wednesday, April 09, 2014		Sheet 27 of 31	

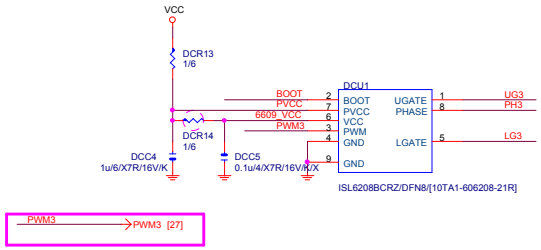
PHASE 1

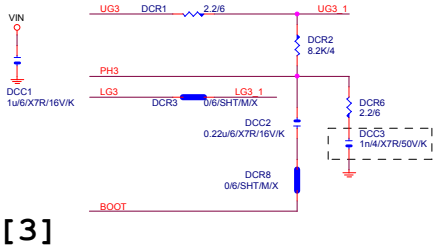


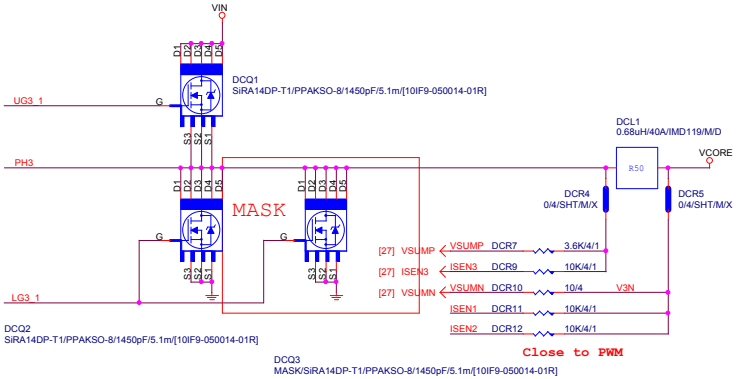




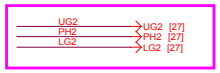
PHASE 3

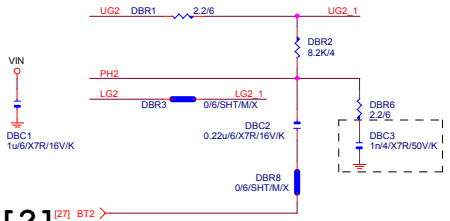


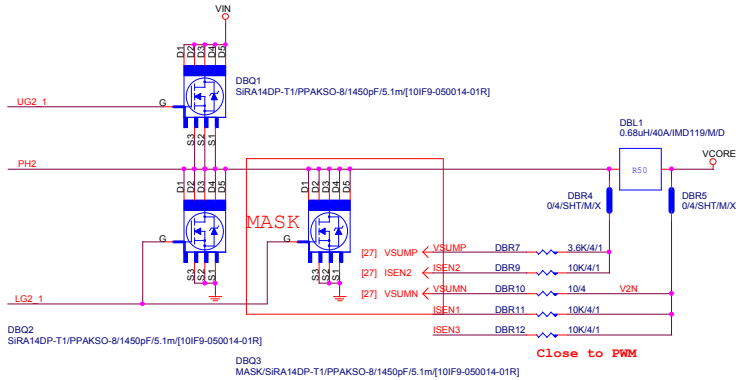


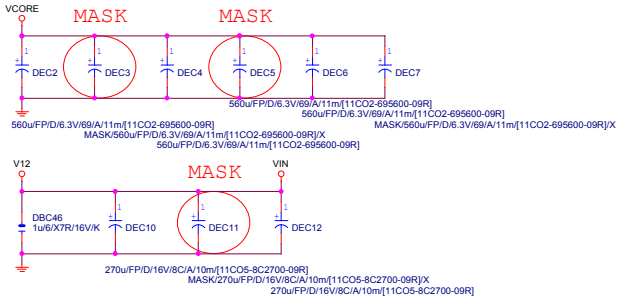


PHASE 2









Gigabyte Technology			
Title: CPU CORE VR-2			
Size: Custom	Document Number: GA-H81M-S2PV		Rev: 2.0
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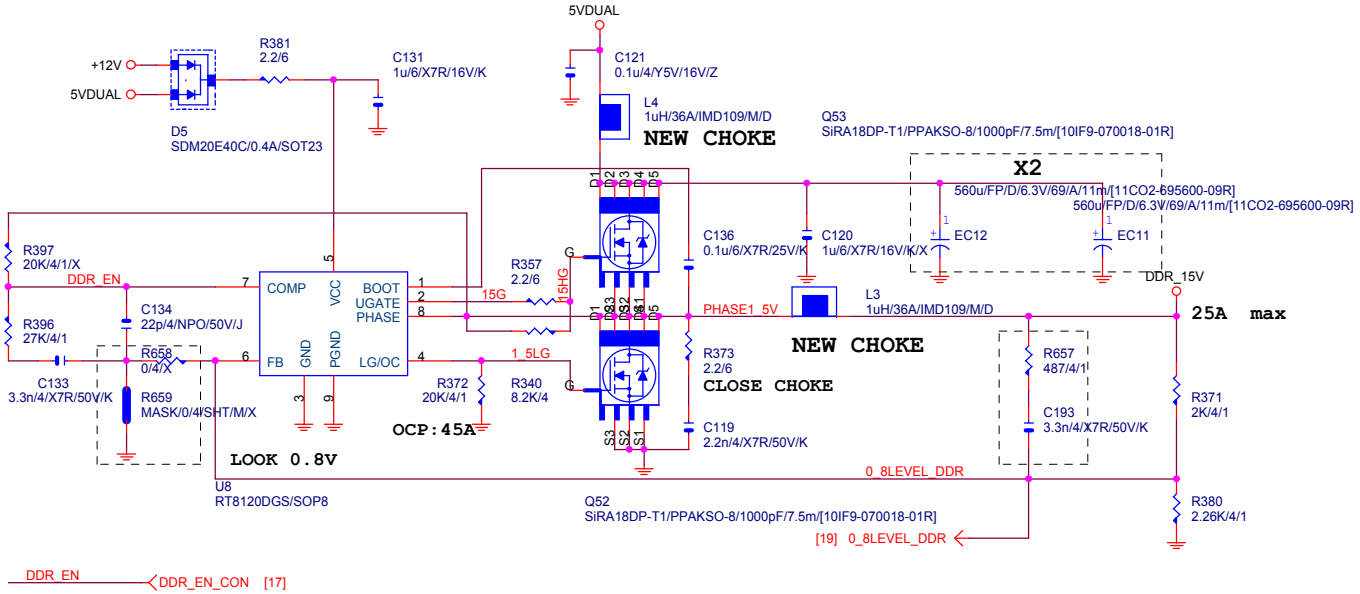
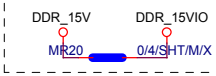
DDR15V



From DDR_15V source
10 mils trace to SIO



PWR SEQ

VIN=5V,VOUT=1.5V,IOUT=25A,PHASE=1
IRMS=11.45A

560u/FP/D/6.3V/68/8m RIPPLE CURRENT=4.7A
Coefficient=1.7(85℃),1(105℃)

VIN Ripple current=4.7X1.7=7.99A(85℃)
-->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: Custom	Document Number: GA-H81M-S2PV		Rev: 2.0
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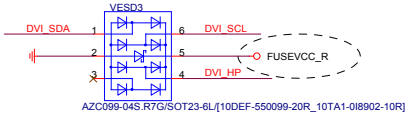
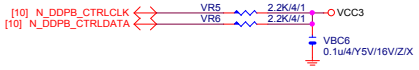
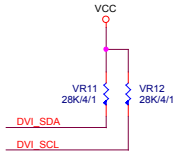
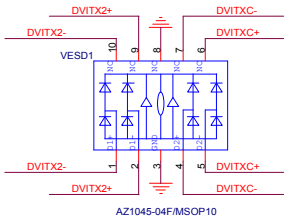
DVI



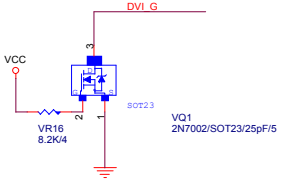
Close to connector

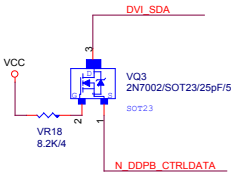


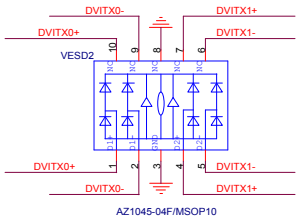




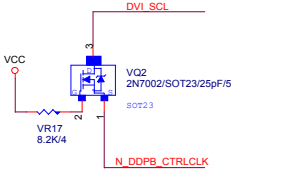
Close to connector

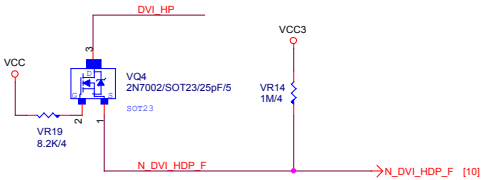


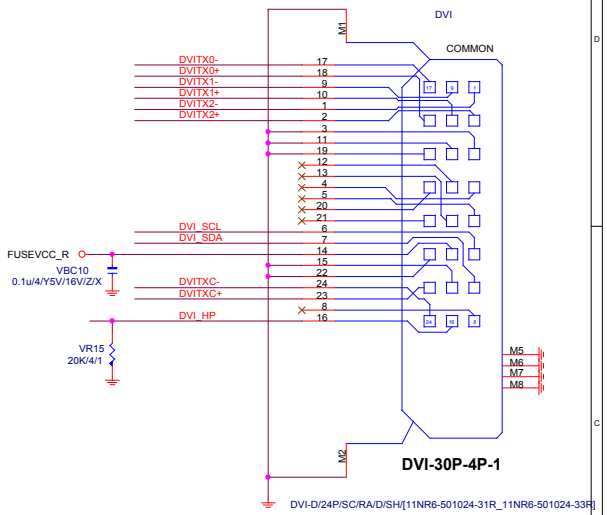




Close to connector







Gigabyte Technology			
Title: DVI			
Size: Custom	Document Number: GA-H81M-S2PV		Rev: 2.0
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PCIE TO PCI

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

Co-Lay IT8893 (IT8893 CLKOUT1 N/A)

IT8892: PR24 -> 47ohm
IT8893: PR24 -> 22ohm

IT8892: PR46 -> X
IT8893: PR46 -> O

IT8892: PR19 -> O
IT8893: PR19 -> X

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

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

IT8892E/BX LQFP128

IT8892E/FX/S

PCB layout note:
Close to chip

PCB layout note:
Close to chip

Close to chip

IT8892

PCI slot

PCI slot

chipset side

Gigabyte Technology			
Title: ITE IT8892E			
Size: Custom	Document Number: GA-H81M-S2PV		Rev: 2.0
Date: Wednesday, April 09, 2014	Sheet 31 of 31		