Model Name: GA-H81M-S2PV

Revision 3.0

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 RTL8111G
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		
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Model Name: GA-H81M-S2PV

Revision 3.0

Component value change history

2014/07/31

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
2014/06/18	Update to R2.01	
	Remove SATA MLCC	
2014/07/08	Update to R2.1	
	LAN RTL8111F -> 8111G	
	8P4R-0402 -> 0603 (KB&MS)	
	Remove 5VDUAL SHORT PROTECT	
	Remove NCT3933, use GPIO(GP24, GP25, GP26)	
	FUSE 1206 3.5A -> 0805 2.6A	
	Heatsink Gray -> Black	

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Title: BOM & PCB MODIFY HISTORY

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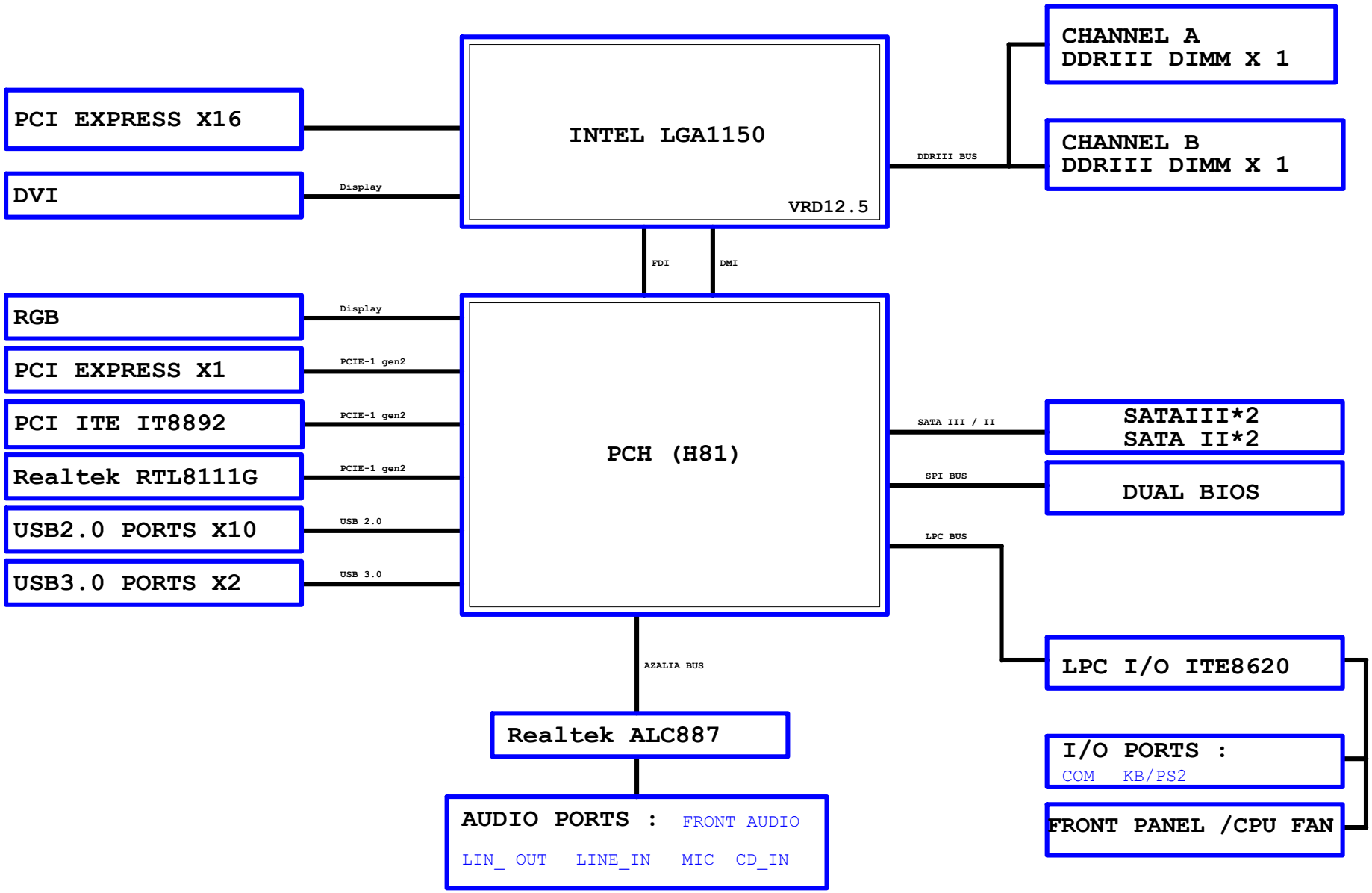
BLOCK DIAGRAM



Gigabyte Technology		
Title: BLOCK DIAGRAM		
Size: C	Document Number: GA-H81M-S2PV	Rev: 3.0
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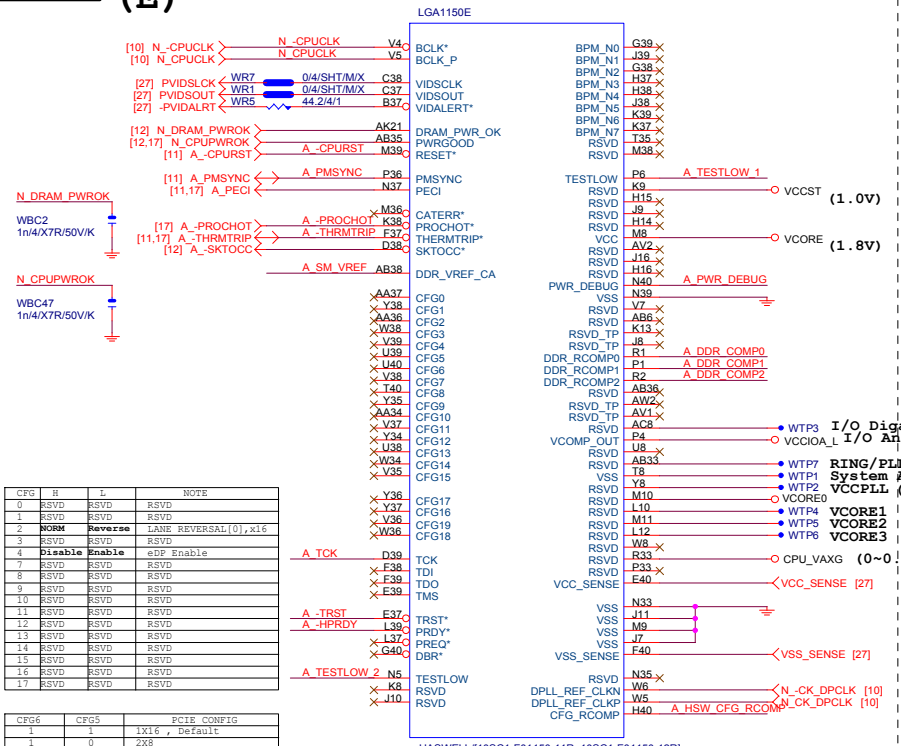
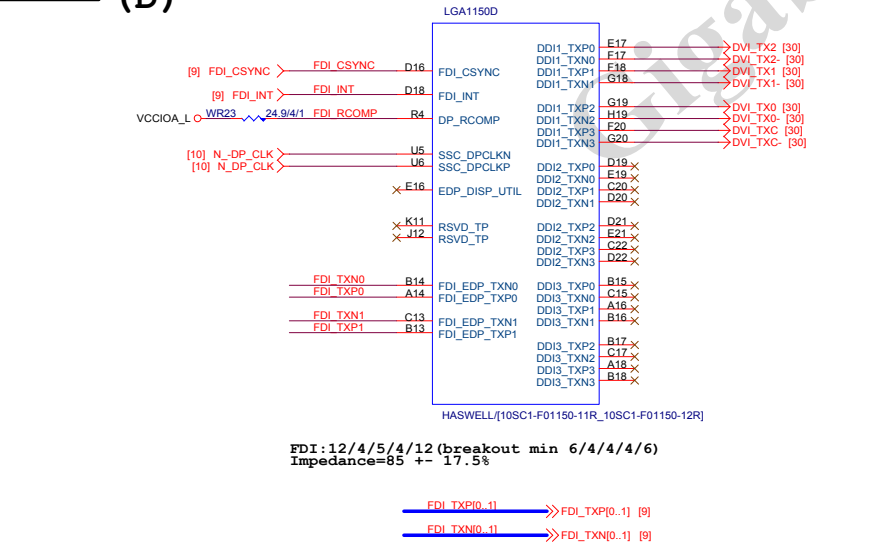
LGA1150 (E)



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

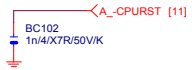
CFG6	CFG5	PCIE CONFIG
1	1	1X16 , Default
1	0	2X8
0	1	RSVD
0	0	X8,X4,X4

LGA1150 (D)

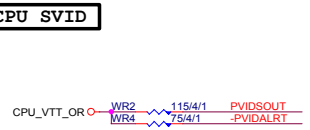


LGA1155 (C)

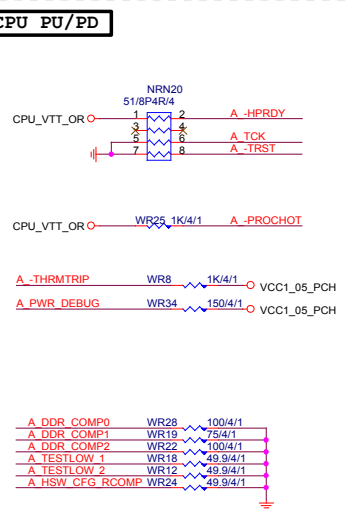
-CPURST



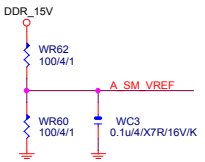
CPU SVID



CPU PU/PD



SM REF



Title	CPU LGA1150-A	
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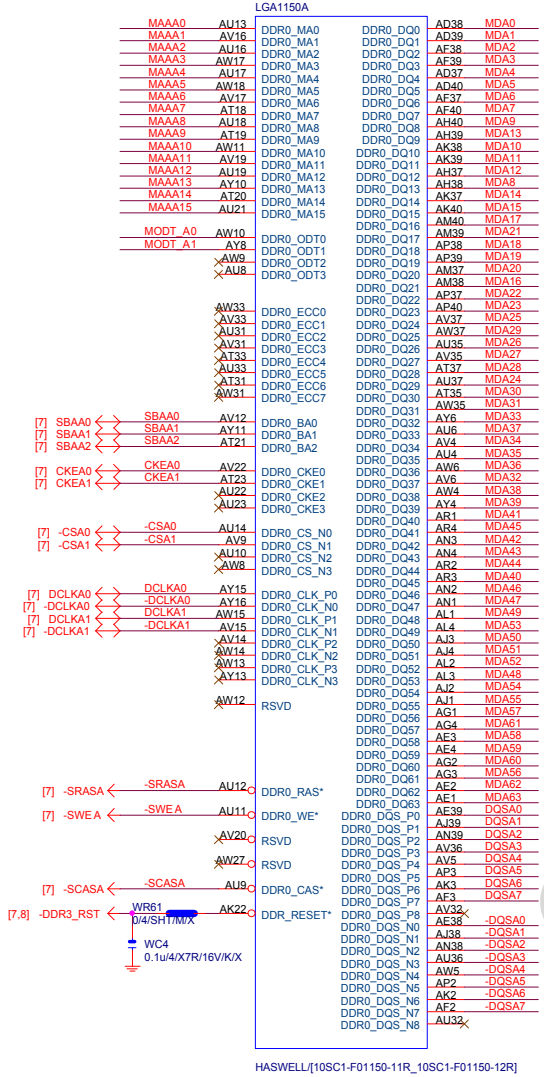
Gigabyte Technology

LGA1150 (A)

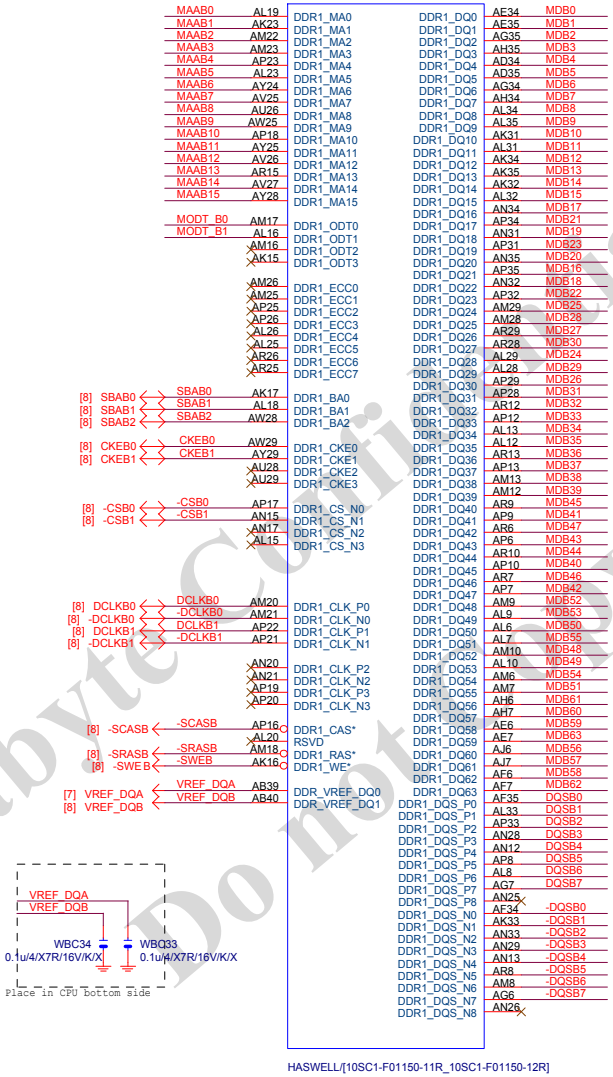
LGA1150A



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

LGA1150 (B)

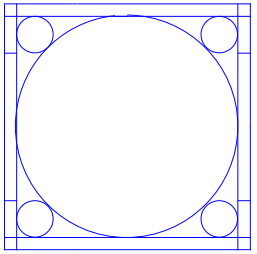
LGA1150B



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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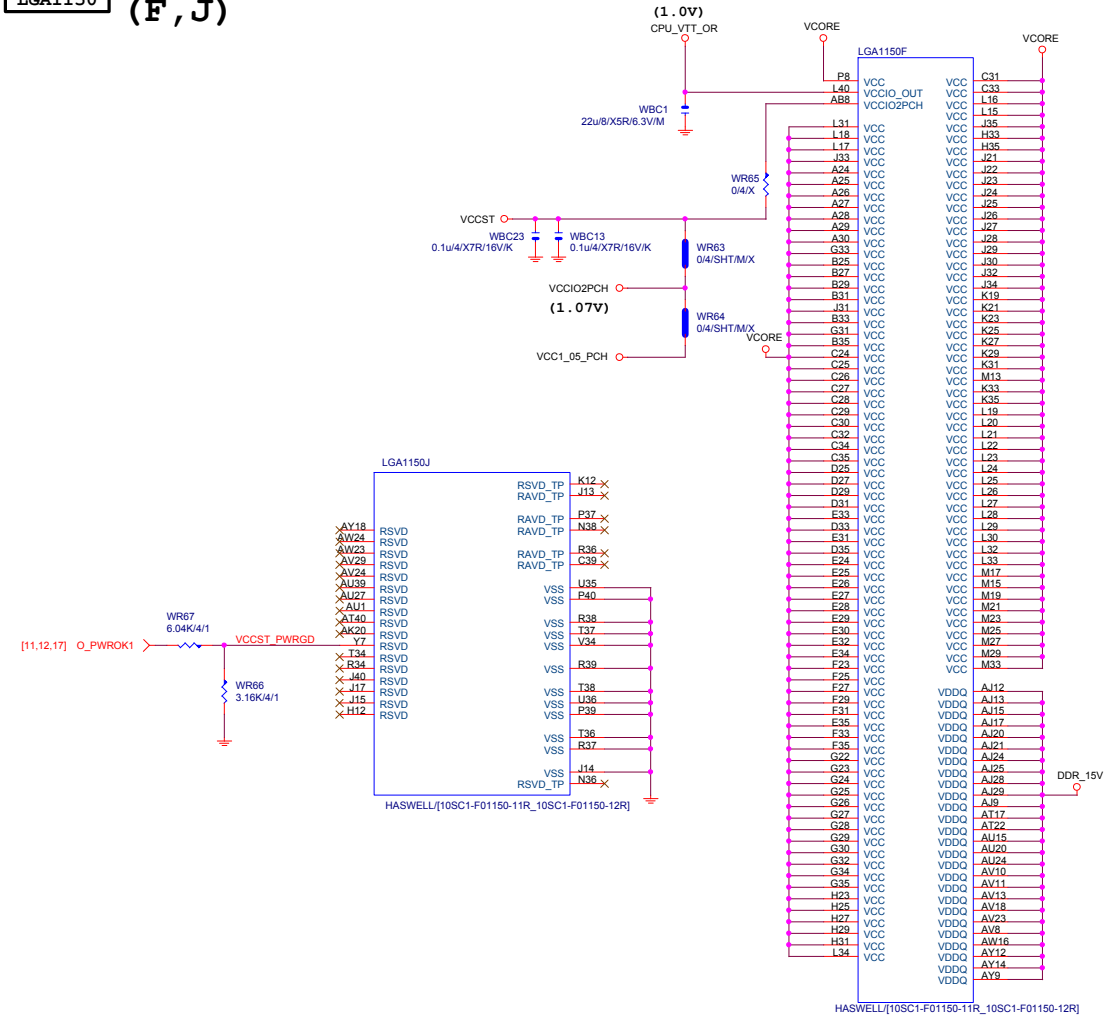
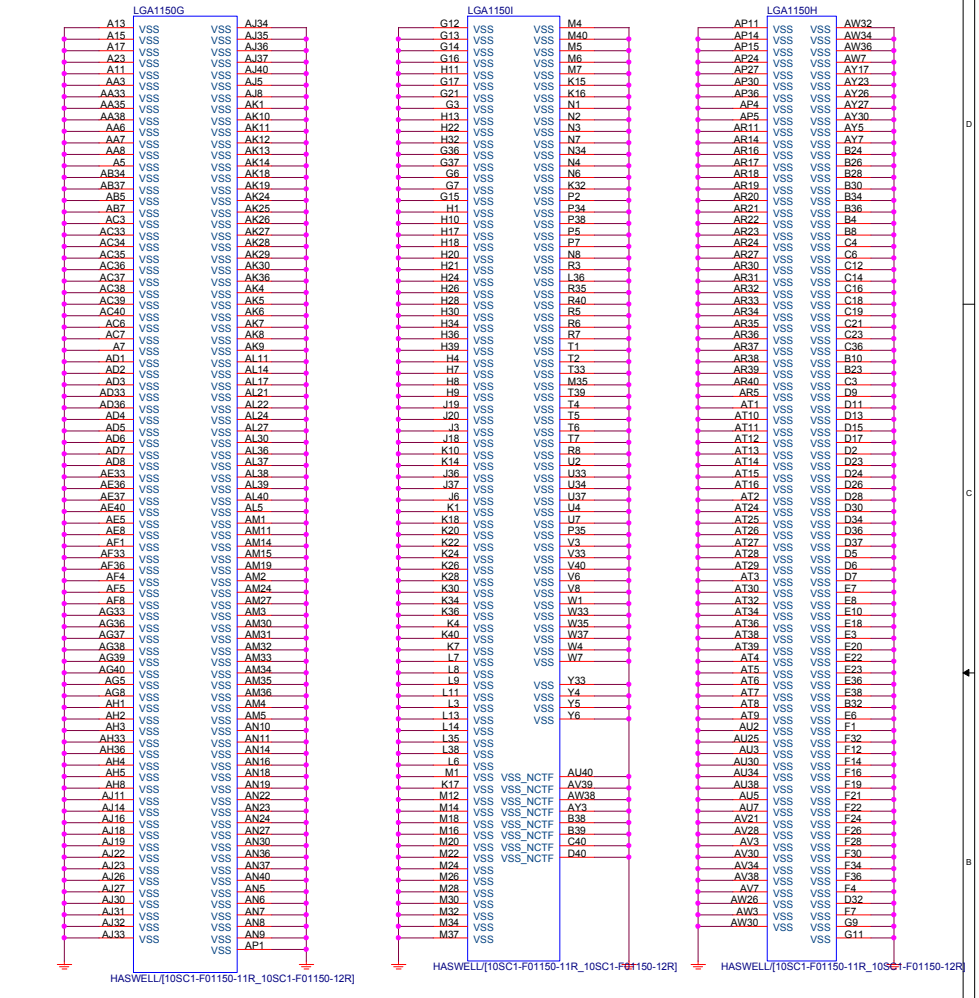
LGA1150 (F,J)

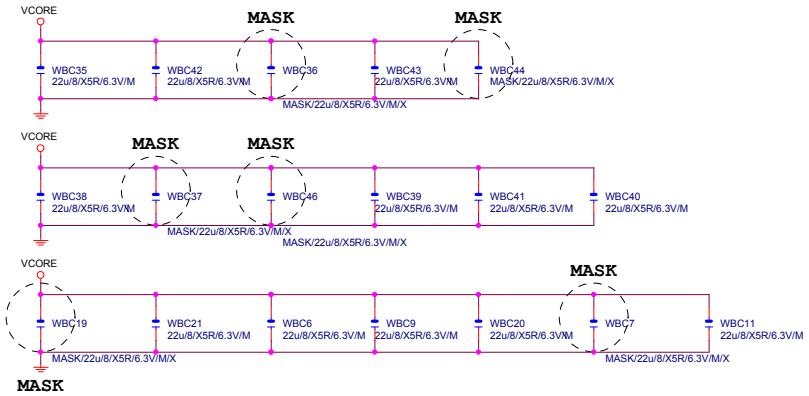


LGA1155 (G,H,I)



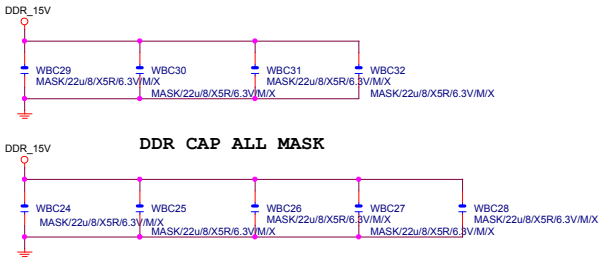
VCore CAP

(X12)



DDR CAP

(X0)



Gigabyte Technology			
Title: CPU LGA1150-C			
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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

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MF1 SPR-P200T/6V/8/S

VCC3 — VDDSPD

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

VDDSPD

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

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

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

MDA[0..63] [5]

MODT_A[0..1] — MODT_A[0..1] [5]

-DQSA[0..7] — -DQSA[0..7] [5]

DQSA[0..7] — DQSA[0..7] [5]

DDR3 VREF

DDR_15V

MR15 1K/4/1 — VREF_DDRA

MR14 1K/4/1

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

MR5 1K/4/1

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/X7R/16V/K

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Title: DDRIII CHANNEL A

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DDR3 (B)

DDR3_2

DDRVTT
VTT (120, 240)
FREE (48, 49, 187, 198)
VSS (2, 5, 8, 11, 14, 17, 20, 23, 26, 29, 32, 35, 38, 41, 44, 47, 80, 83, 86, 89, 92, 95, 98, 101, 104, 107, 110, 113, 116, 119, 121, 124, 127, 130, 133, 136, 139, 142, 145, 148, 151, 154, 157, 160, 163, 166, 199, 202, 205, 208, 211, 214, 217, 220, 223, 226, 229, 232, 235, 239)
RSVD (79)
ODT1 (77) MODT_B1
ODT0 (195) MODT_B0
NC/PAR_IN (68)
NC/ERR_OUT (53)
NC/TEST4 (167)
CB0 (39)
CB1 (40)
CB2 (45)
CB3 (46)
CB4 (158)
CB5 (159)
CB6 (164)
CB7 (165)
DQS0 (7) DQSB0
DQS0* (6) -DQSB0
DQS1 (16) DQSB1
DQS1* (15) -DQSB1
DQS2 (25) DQSB2
DQS2* (24) -DQSB2
DQS3 (34) DQSB3
DQS3* (33) -DQSB3
DQS4 (85) DQSB4
DQS4* (84) -DQSB4
DQS5 (94) DQSB5
DQS5* (93) -DQSB5
DQS6 (103) DQSB6
DQS6* (102) -DQSB6
DQS7 (112) DQSB7
DQS7* (111) -DQSB7
DQS8 (43)
DQS8* (42)
DM0/DQS9 (125)
NC/DQS9* (126)
DM1/DQS10 (134)
NC/DQS10* (135)
DM2/DQS11 (143)
NC/DQS11* (144)
DM3/DQS12 (152)
NC/DQS12* (153)
DM4/DQS13 (203)
NC/DQS13* (204)
DM5/DQS14 (212)
NC/DQS14* (213)
DM6/DQS15 (221)
NC/DQS15* (222)
DM7/DQS16 (230)
NC/DQS16* (231)
DM8/DQS17 (161)
NC/DQS17* (162)
VDD (51, 54, 57, 60, 62, 65, 66, 69, 72, 75, 78, 170, 173, 176, 179, 182, 183, 186, 189, 191, 194, 197)
DDR_15V
MC2 0.1u/4/X7R/16V/K/X
VDDSPD (236)
MC14 0.1u/4/X7R/16V/K/X VREF_DDRB (67)
MC9 0.1u/4/X7R/16V/K/X VREF_DQDDRB (1)
VREFCA
VREFDQ
DQ0 (3) MDB0
DQ1 (4) MDB1
DQ2 (9) MDB2
DQ3 (10) MDB3
DQ4 (122) MDB4
DQ5 (123) MDB5
DQ6 (128) MDB6
DQ7 (129) MDB7
DQ8 (12) MDB8
DQ9 (13) MDB9
DQ10 (18) MDB10
DQ11 (19) MDB11
DQ12 (131) MDB12
DQ13 (132) MDB13
DQ14 (137) MDB14
DQ15 (138) MDB15
DQ16 (21) MDB16
DQ17 (22) MDB17
DQ18 (27) MDB18
DQ19 (28) MDB19
DQ20 (140) MDB20
DQ21 (141) MDB21
DQ22 (146) MDB22
DQ23 (147) MDB23
DQ24 (30) MDB24
DQ25 (31) MDB25
DQ26 (36) MDB26
DQ27 (37) MDB27
DQ28 (149) MDB28
DQ29 (150) MDB29
DQ30 (155) MDB30
DQ31 (156) MDB31
DQ32 (81) MDB32
DQ33 (82) MDB33
DQ34 (87) MDB34
DQ35 (88) MDB35
DQ36 (200) MDB36
DQ37 (201) MDB37
DQ38 (206) MDB38
DQ39 (207) MDB39
DQ40 (90) MDB40
DQ41 (91) MDB41
DQ42 (96) MDB42
DQ43 (97) MDB43
DQ44 (209) MDB44
DQ45 (210) MDB45
DQ46 (215) MDB46
DQ47 (216) MDB47
DQ48 (99) MDB48
DQ49 (100) MDB49
DQ50 (105) MDB50
DQ51 (106) MDB51
DQ52 (218) MDB52
DQ53 (219) MDB53
DQ54 (224) MDB54
DQ55 (225) MDB55
DQ56 (108) MDB56
DQ57 (109) MDB57
DQ58 (114) MDB58
DQ59 (115) MDB59
DQ60 (227) MDB60
DQ61 (228) MDB61
DQ62 (233) MDB62
DQ63 (234) MDB63
MDB[0..63] [5]
[7,12,14,15,16,21] N_SMBCLK → N_SMBCLK (118) SCL
[7,12,14,15,16,21] N_SMBDATA → N_SMBDATA (238) SDA
VDDSPD (237) SA1
SA0 (117)
[5] SBAB2 → SBAB2 (52) BA2
[5] SBAB1 → SBAB1 (190) BA1
[5] SBAB0 → SBAB0 (71) BA0
[5] CKEB1 → CKEB1 (169) CKE1
[5] CKEB0 → CKEB0 (50) CKE0
[5] -CSB1 → -CSB1 (76) S1*
[5] -CSB0 → -CSB0 (193) S0*
[5] -DCLKB1 → -DCLKB1 (64) CK1/NU*
[5] DCLKB1 → DCLKB1 (63) CK1/NU
[5] -DCLKB0 → -DCLKB0 (185) CK0*
[5] DCLKB0 → DCLKB0 (184) CK0
[5] MAAB[0..15] → MAAB0 (188) A0
MAAB1 (181) A1
MAAB2 (61) A2
MAAB3 (180) A3
MAAB4 (59) A4
MAAB5 (58) A5
MAAB6 (178) A6
MAAB7 (56) A7
MAAB8 (177) A8
MAAB9 (175) A9
MAAB10 (70) A10/AP
MAAB11 (55) A11
MAAB12 (174) A12
MAAB13 (196) A13
MAAB14 (172) A14
MAAB15 (171) A15
[5,7] -DDR3_RST → RESET* (168)
[5] -SCASB → -SCASB (74) CAS*
[5] -SRASB → -SRASB (192) RAS*
[5] -SWEB → -SWEB (73) WE*

DDR3/240/BK/VA/D

BLACK CONNECTOR

-DQSB[0..7] → -DQSB[0..7] [5]
DQSB[0..7] → DQSB[0..7] [5]
MODT_B[0..1] → MODT_B[0..1] [5]

DDR3 VREF

DDR_15V
MR10 1K/4/1 → VREF_DDRB
MR11 1K/4/1
DDR_15V
MR8 1K/4/1 → VREF_DQDDRB → VREF_DQB [5]
MR9 1K/4/1

COUPON

COUPON1 COUPON1 1 2 COUPON/X
COUPON2 COUPON2 1 2 COUPON/X

CPU

DIMM4
DIMM2
CHA
DIMM3
DIMM1
CHB

Gigabyte Technology

Title: DDRIII CHANNEL B

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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

[4] A_DMI_0TXN L24 A_DMI_0TXP K24 [4] A_DMI_0RXN C20 A_DMI_0RXP B20 [4] A_DMI_0RXP G24 A_DMI_1TXN H24 [4] A_DMI_1TXP D21 A_DMI_1RXN B21 [4] A_DMI_1RXP F26 A_DMI_2TXN G26 [4] A_DMI_2TXP B22 A_DMI_2RXN C22 [4] A_DMI_2RXP K26 A_DMI_3TXN L26 [4] A_DMI_3TXP A24 A_DMI_3RXN B24 [4] 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 B19 PCIE_COMP C13 NR40 7.5K/4/1

CK_-SRCCLK_PCH G22 CK_SRCCLK_PCH F22

CLKIN_DMI_N CLKIN_DMI_P

DMI_RCOMP PCIE_RCOMP

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 N_-USBP0 AU10 N_+USBP0 AV11 N_-USBP1 AW11 N_+USBP1 AN14 N_-USBP2 AP14 N_+USBP2 AJ16 N_-USBP3 AK16 N_+USBP3 AU15 AV15 AU12 AT12 AV14 AW14 AU17 AT17

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

AW16 N_-USBP8 AV16 N_+USBP8 AN16 N_-USBP9 AP16 N_+USBP9 AJ18 N_-USBP10 AK18 N_+USBP10 AP18 N_-USBP11 AN18 N_+USBP11 AW18 AV18 AP20 AN20

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

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

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

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

F11 H11 B9 A9 J11 L11 B8 C8 G9 F9 B7 A7 F7 H7 E1 D2 K6 K8 G3 G5 J2 J3 H2 H1

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_GPIO14

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

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

USBRBIASB USBRBIAS

AV20 N_USBRBIAS NR47 22.6/4/1 AU20

CLKIN_DOT96N CLKIN_DOT96P

AP11 CK_-DOTCLK AM11 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

放靠近 Device & PCI-E Slot
Impedance=80 +- 17.5%
PCIEX1:16/5/5/5/16 (breakout min 8/4/4/4/8)

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

PCH (F)

PCHF

USB3 FDILINK

[21] PCH_USB3_RXN0 F20 USB3_RXN_0 FDI_RXN_0 N1 FDI_TXN0
[21] PCH_USB3_RXP0 G20 USB3_RXP_0 FDI_RXP_0 N2 FDI_TXP0
[21] PCH_USB3_TXN0 B18 USB3_TXN_0 FDI_RXN_1 P2 FDI_TXN1
[21] PCH_USB3_TXP0 C18 USB3_TXP_0 FDI_RXP_1 P3 FDI_TXP1

[21] PCH_USB3_RXN1 G18 USB3_RXN_1
[21] PCH_USB3_RXP1 H18 USB3_RXP_1 FDI_CSYNC L2 FDI_CSYNC FDI_CSYNC [4]
[21] PCH_USB3_TXN1 B15 USB3_TXN_1 FDI_INT L3 FDI_INT FDI_INT [4]
[21] PCH_USB3_TXP1 B16 USB3_TXP_1 FDI_RCOMP K2 NR29 7.5K/4/1 VCC1_5_PCH

K20 USB3_RXN_4
L20 USB3_RXP_4
D15 USB3_TXN_4
C15 USB3_TXP_4

N/A

L18 USB3_RXN_5
K18 USB3_RXP_5
B14 USB3_TXN_5
A14 USB3_TXP_5

VCC3 NR62 8.2K/4/X NR63 8.2K/4/X AK28 AT34

TACH6_GP70
TACH7_GP71

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

BLACK HS

PCH_HS
PCH_HS/[12SP2-030005-51R_12SP2-030005-52R_12SP2-030005-53R]

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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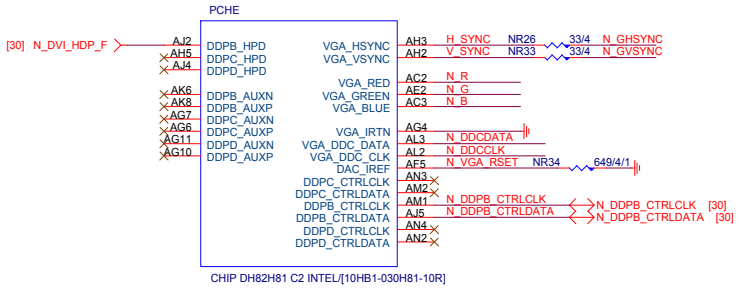
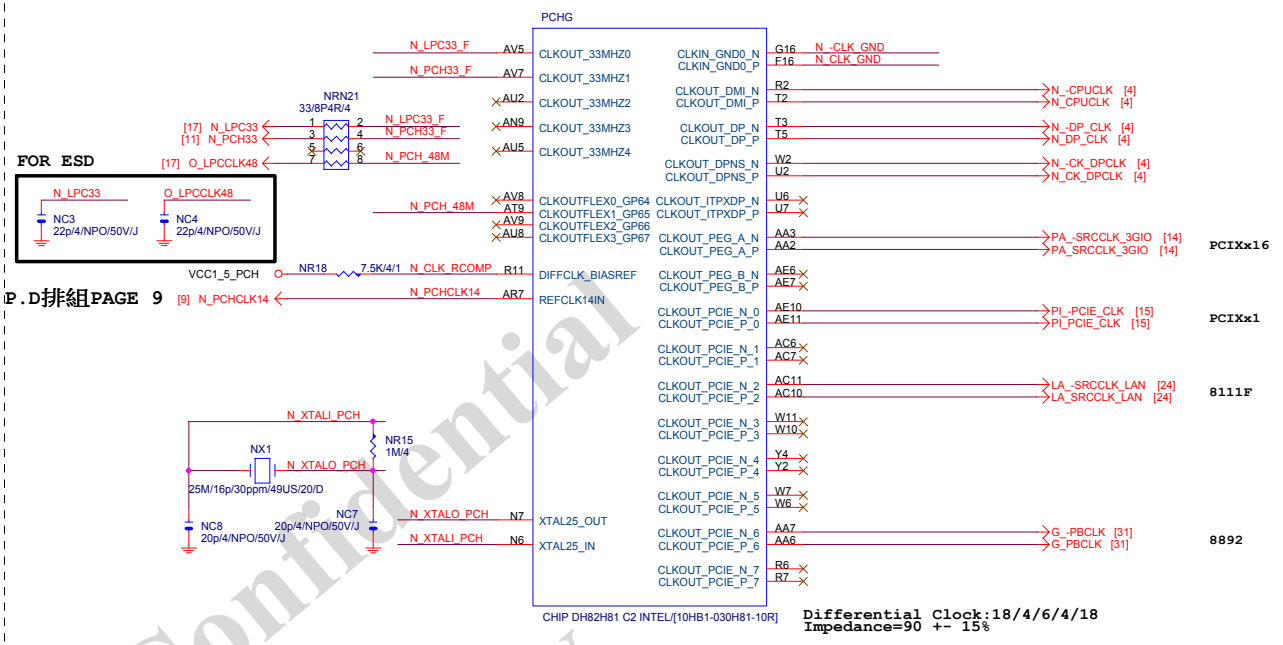
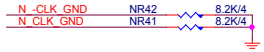
PCH (E)



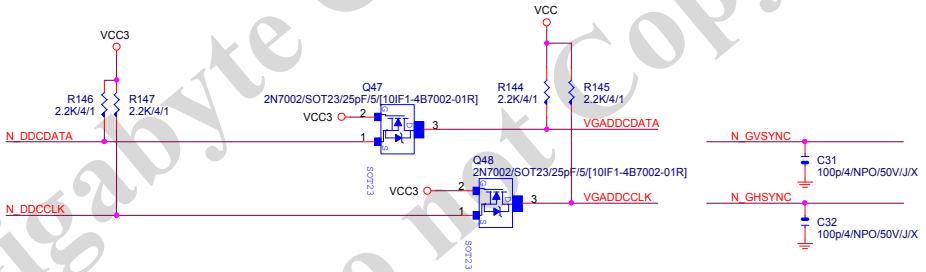
PCH (G)



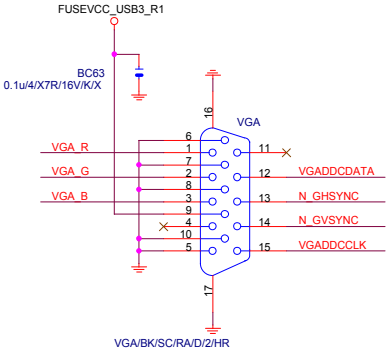
PCH CLK PD



VGA DDC

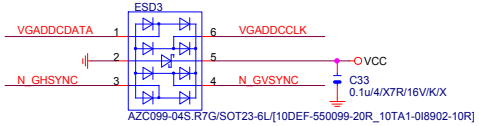


VGA CONNECTOR

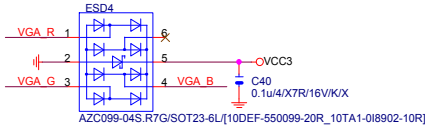


BLACK CONNECTOR

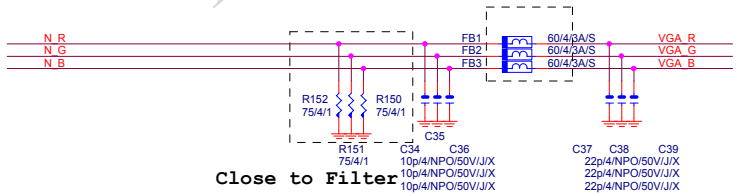
VGA ESD



SSOP6_ESD



VGA DDC



Close to Filter

Gigabyte Technology			
Title: PCH DISPLAY ,CLK BUFFER			
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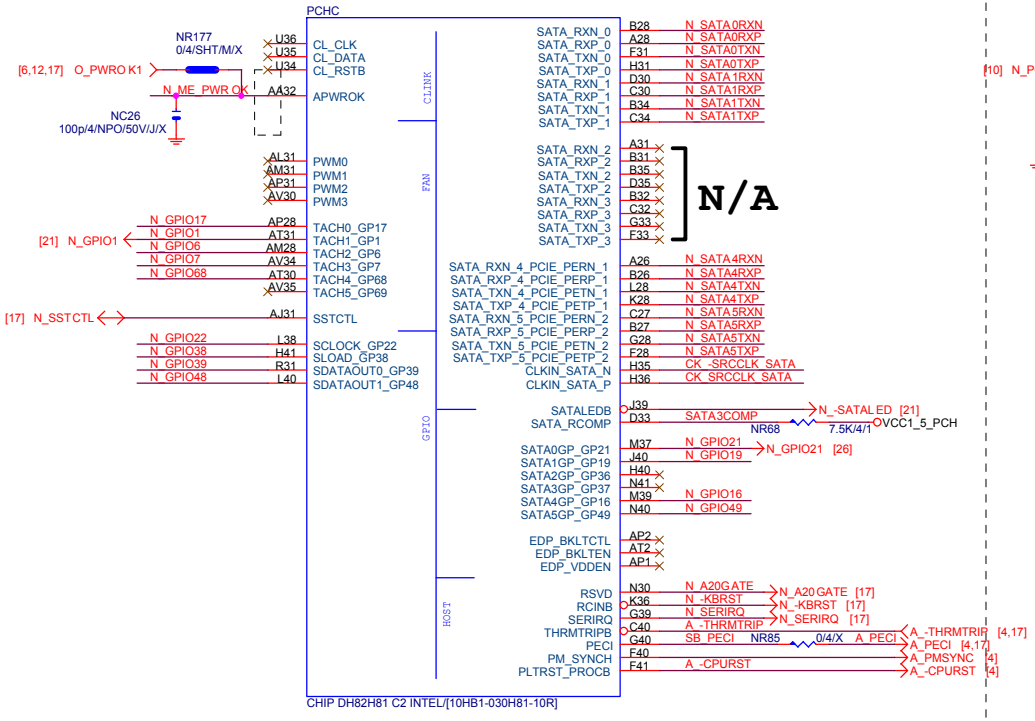
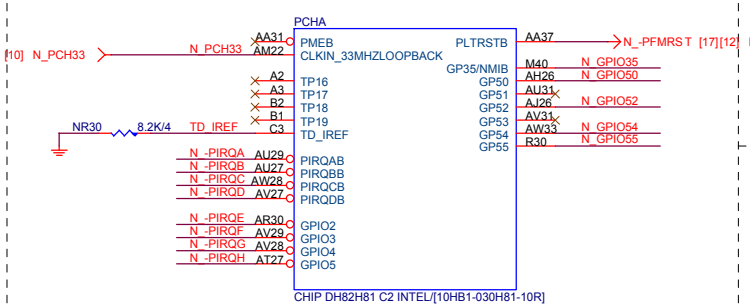
PCH (C)

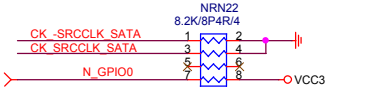
SATA3 : 20/7.5/4.5/7.5/20 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%
SATA2 : 15/7.5/4.5/7.5/15 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%



PCH (A)

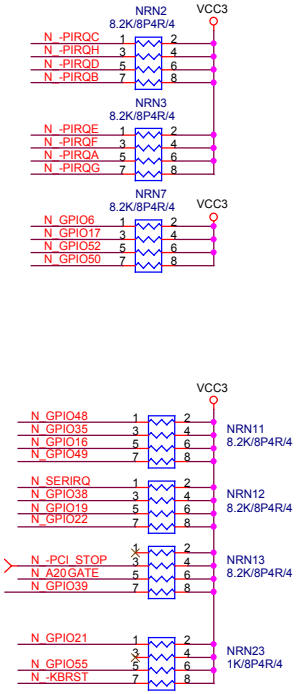


PCH CLK PD



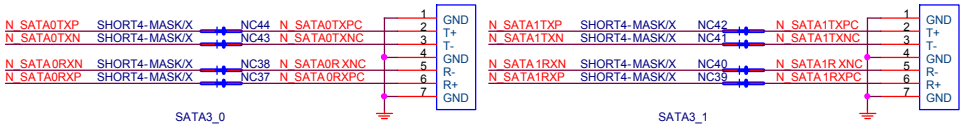
Mount for integrated clock Generation Mode

PCH PU/PD

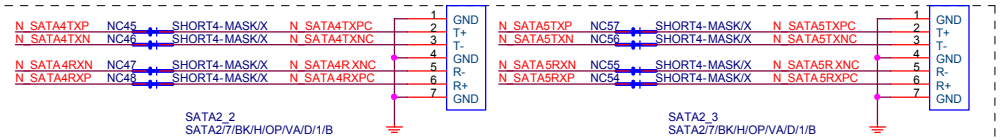


SATA CONNECTOR

Remove SATA MLCC [Footprint: C0402-SHORT4-MASK]

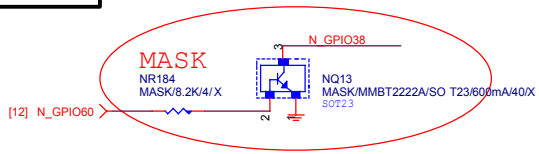


** Z87/H87 Port 4&5 SATA3.0
** B85 Port 4&5 SATA2.0



GPIO38 Ctrl

N/A



Gigabyte Technology

Title	PCH HOST , SATA, PCI	
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PCH (D)

NRN15 33/8P4R/4
[22] C_ACZ_SDOUT
[22] C_ACZ_BITCLK
[22] C_ACZ_SYNC
[22] C_-ACZ_RST
A_SO
A_BCLK
A_SYC
A_RST

[17] N_LAD[0..3] → N_LAD[0..3]

PCHD

[17] N_LAD0	N_LAD0	AK26	LDRQ1B_GP23
[17] N_LAD1	N_LAD1	AN24	LAD_0
[17] N_LAD2	N_LAD2	AP26	LAD_1
[17] N_LAD3	N_LAD3	AJ24	LAD_2
[17] N_-LDRQ0	N_-LDRQ0	AN26	LAD_3
[17] N_-LFRAME	N_-LFRAME	AK22	LDRQ0B
		AP24	LFRAMEB
	A_BCLK	AV23	HDA_BCLK
	A_RST	AU24	HDA_RSTB
		AT26	HDA_SDI0
		AV22	HDA_SDI1
[22] C_ACZ_SDIN2		AT22	HDA_SDI2
		AW23	HDA_SDI3
	A_SO	AU22	HDA_SDO
	A_SYC	AV24	HDA_SYNC
[20] N_ICH_SPI_MOSI		P40	SPI_MOSI_IO0
[20] N_ICH_SPI_MISO		R36	SPI_MISO_IO1
[20] N_-ICH_SPI_CS		R38	SPI_CS0B
[20] N_ICH_SPI_CLK		U39	SPI_CLK
		R35	SPI_CS1B
		R40	SPI_CS2B
[20] SPI_DQ2		U40	SPI_IO2
[20] SPI_DQ3		U37	SPI_IO3
	N_Y1	AN40	RTCX1
	N_Y2	AN39	RTCX2
	N_-RTCRST	AN38	RTESTB
	N_-SRTCRST	AN39	SRTCRSTB
	N_-INTRUDER	AR41	INTRUDERB
[6,11,17] O_PWROK1	O_PWROK1	AT40	PCH_PWROK
[17,25] O_-RSMRST	O_-RSMRST	AM40	RSMRSTB
	N_INTVRMEN	AV36	INTVRMEN
	N_PCH_DPWROK	AV38	DPWROK
	N_DSWVRMEN	AM41	DSWODVREN
[17] N_-LPCPME	N_-LPCPME	AG31	SMBALERTB_GP11
[7,8,14,15,16,21] N_SMBCLK	N_SMBCLK	AG36	SMBCLK
[7,8,14,15,16,21] N_SMBDATA	N_SMBDATA	AG32	SMBDATA
[11] N_GPIO60	N_GPIO60	AG35	SML0ALERTB_GP60
	N_SML0CLK	AE32	SML0CLK
	N_SML0DAT	AE35	SML0DATA
	N_-PCH_HOT	AJ39	SML1ALERTB_PCHHOTB_GP74
	N_SML1CLK	AK36	SML1CLK_GP58_MGPIO11
	N_SML1DAT	AK33	SML1DATA_GP75_MGPIO12

		G38	BMBUSYB_GP0
		N32	CLKRUNB_GP32
		AV26	DOCKENB_GP33
		N34	STPPCIB_GP34
		AC40	GP8
		AL40	LAN_PHY_PWR_CTRL_GP12
		AN22	HDA_DOCK_RSTB_GP13
		AC32	GP15
		AE34	GP24
		V41	GP28
		AL39	SLP_WLANB_GP29
		W34	PCIECLKRQ0B_GP73
		P39	PCIECLKRQ1B_GP18
		P37	PCIECLKRQ2B_GP20_SMIB
		AA39	PCIECLKRQ3B_GP25
		W35	PCIECLKRQ4B_GP26
		AA36	PCIECLKRQ5B_GP44
		W32	PCIECLKRQ6B_GP45
		AA40	PCIECLKRQ7B_GP46
		AC36	GP57
		W31	SYS_PWROK
		AE36	RIB
		AK34	WAKEB
		AN37	SLP_AB
		AU36	SLP_LANB
		AC35	SLP_S0B
		AK40	SLP_S3B
		AT35	SLP_S4B
		AA35	SLP_S5B_GP63
		AD37	SUS_STATB_GP61
		W36	SUSCLK_GP62
		AJ40	GP72
		AJ37	SUSACKB
		AG41	SUSWARNB_SUSPWRDNACK_GP30
		AE38	DRAMPWRGD
		AU34	GP27
		AM36	ACPRESENT_GP31_MGPIO2
		AK38	SLP_SUSB
		AK41	PWRBTNB
		N36	SYS_RESETB
		R32	SPKR
		D40	PROCPWRGD
		W37	TP13
		Y40	JTAG_TCK
		W39	JTAG_TDI
		Y38	JTAG_TDO
		W40	JTAG_TMS

G38	N_GPIO0 → N_GPIO0 [11]
N32	N_GPIO33
AV26	N_-PCI_STOP → N_-PCI_STOP [11]
N34	N_-IGC_EN
AC40	-D_GPIO_HRST
AL40	N_TEMP_ALART → N_TEMP_ALART- [17]
AN22	A_-SKTOCC → A_-SKTOCC [4]
AC32	N_GPIO28
AE34	N_GPIO29
V41	N_GPIO73
AL39	N_GPIO18
W34	N_GPIO20
P39	N_GPIO25
P37	N_GPIO26
AA39	N_GPIO44
W35	N_GPIO45
AA36	N_GPIO46
W32	
AA40	
AC36	N_GPIO57
W31	N_PCH_VRMPWRGD [17]
AE36	N_-RI [18]
AK34	N_-PCIE_WAKE [14,15,24,31]
AN37	
AU36	
AC35	
AK40	N_-SLP_S3 [17]
AT35	N_-S4_S5 [17]
AA35	
AD37	
W36	N_SUSCLK
AJ40	N_GPIO72
AJ37	
AG41	N_-S_WARN
AE38	N_DRAM_PWROK
AU34	N_GPIO27
AM36	N_GPIO31
AK38	N_-DEPSLP → N_-DEPSLP [25]
AK41	O_PWRBTSW [17]
N36	N_-SYS_RST → N_-SYS_RST [21]
R32	N_SPKR → N_SPKR [21]
D40	N_CPUPWROK → N_CPUPWROK [4,17]
W37	N_PCH_RST
Y40	N_PCH_TCK
W39	N_PCH_TDI
Y38	N_PCH_TDO
W40	N_PCH_TMS

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

DDR_15V
NR131 680/4/1
N_DRAM_PWROK → N_DRAM_PWROK [4]
NR132 1.47K/4/1

O_PWROK1
NC51 0.01u/4/X7R/25V/K/X
Reserve for EMI test

N_-SLP_S3 — NC60 100p/4/NPO/50V/J — **ESD**
N_-S4_S5 — NC61 100p/4/NPO/50V/J — **ESD**
N_CPUPWROK — NC62 100p/4/NPO/50V/J — **ESD**

ACZ_SDOUT

N/A

PCH_DPWROK

N_PCH_DPWROK → N_PCH_DPWROK [17]
NC17 1n/4/X7R/50V/K
for IT8620 Ctrl

VCC3
NR345 1K/4/1
N_PCH_VRMPWRGD → N_PCH_VRMPWRGD [17]
NR346 100K/4/1
DC17 0.1u/4/X7R/16V/K

PCH PU/PD

3VDUAL

NRN16 1K/8P4R/4
N_SML1CLK
N_SML1DAT
N_GPIO29

NRN9 8.2K/8P4R/4
N_GPIO46
N_GPIO45
N_GPIO44
N_GPIO57

NRN10 8.2K/8P4R/4
A_-SKTOCC
N_TEMP_ALART-
N_-RI

GP8:Low to enable PCH clock chip
NR106 1K/4/1 N_-IGC_EN
NR153 1K/4/1/X N_SUSCLK
SUSCLK:Low to OD PLL VR
-D_GPIO_HRST NR51 1K/4/1
N_GPIO28 NR144 1K/4/1
GP28:Lo disable VRM ,Hi enable VRM

3VDUAL_PCH

NRN17 8.2K/8P4R/4
N_-S_WARN
N_GPIO72
N_GPIO31
N_PCH_DPWROK
N_GPIO27 NR60 6.2K/4
N_-PCIE_WAKE NR76 1K/4/1

VCC3

N_GPIO20 NR109 1K/4/1
N_-SYS_RST NR164 8.2K/4
N_GPIO33 NR49 8.2K/4

3VDUAL

NRN18 200/8P4R/4
N_PCH_RST NR172 20K/4/1
N_PCH_TDI
N_PCH_TMS
N_PCH_TDO

NRN19 100/8P4R/4
N_PCH_TDO
N_PCH_TMS
N_PCH_TDI
N_PCH_TCK NR108 51/4/1

NRN24 8.2K/8P4R/4
N_GPIO18
N_GPIO26
N_GPIO73
N_GPIO25

N_-SYS_RST NC58 1n/4/X7R/50V/K
N_DRAM_PWROK NC59 1n/4/X7R/50V/K

NRN6 8.2K/8P4R/4
3VDUAL
N_-LPCPME
N_GPIO60
N_-PCH_HOT

NR122 499/4/1 N_SML0CLK
NR123 499/4/1 N_SML0DAT
NR121 1K/4/1 N_SMBCLK
NR97 1K/4/1 N_SMBDATA

HSW_STRAP13

N/A

32.768KHZ

NX2-SHT SHW/D0.64*5.08*6.74
N_Y1
N_Y2 NR75 10M/4 NX2
32.768K/12.5p/20ppm/TF38/35K/D
NC16 18P/4/NPO/50V/J
NC18 18P/4/NPO/50V/J
XTALS-RH-N

CLR_CMOS

BATTERY CR2032
ND1 BAS40-05/0.2A/SOT23
3VDUAL_PCH
NR340 0/6/SHT/M/X
BAT BAT-SK/BK/P/S/D/SN
N_VBATT NRB 1K/4/1
NR90 390K/4 N_DSWVRMEN
N_RTCVDD → N_RTCVDD [13,19]
NR67 390K/4 N_INTVRMEN
NR78 20K/4/1 N_-RTCRST
NC15 1u/4/X5R/6.3V/K
NC20 1u/4/X5R/6.3V/K
RB_TP
N_VBAT → N_VBAT [17]
CLR_CMOS N_-RTCRST
PH/1*2/BK/2.54/VA/D

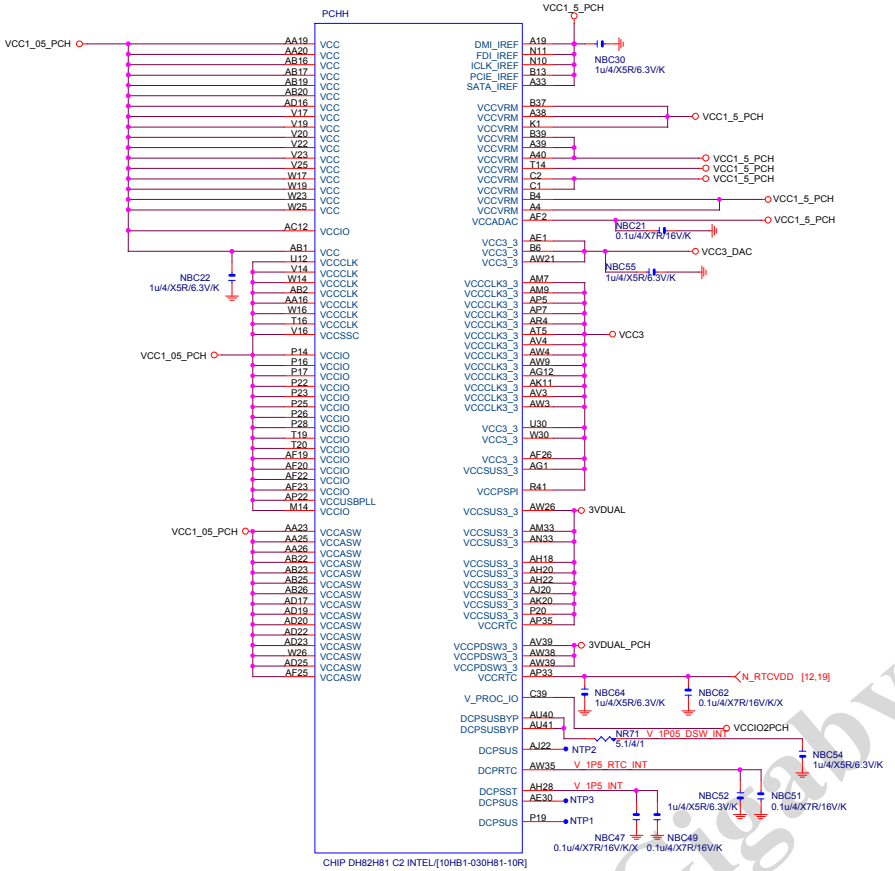
BATTERY-DUAL-4
RB 必须放在BAT外

N_-INTRUDER NR74 1M/4 → N_RTCVDD [13,19]
N_-SRTCRST NR77 20K/4/1 → N_RTCVDD [13,19]
NC19 1u/4/X5R/6.3V/K

Gigabyte Technology

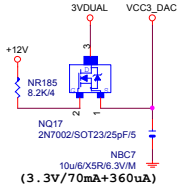
Title	PCH GPIO , CTRL , AUDIO	
Size: Custom	Document Number: GA-H81M-S2PV	Rev: 3.0
Date: Thursday, August 07, 2014	Sheet 12 of 31	

PCH (H)

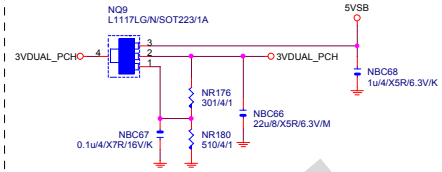


VCC3_DAC

CLOSE北橋(注意震盪水波紋)

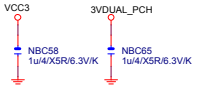


3VDUAL_PCH

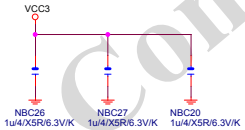


SHT PWR

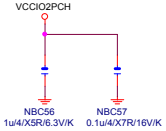
CAP



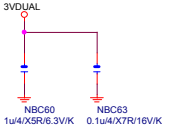
(3.3V) (X6)



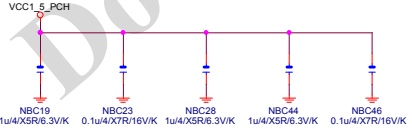
(1.05V)(X2)



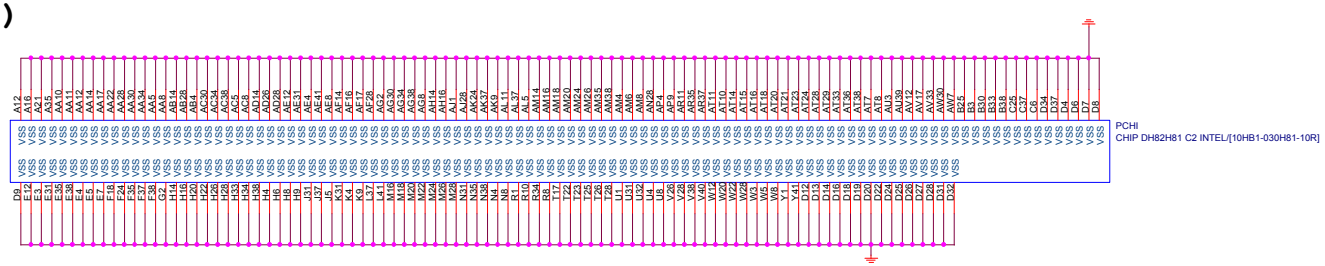
(3.3V) (X2)



(1.5V) (X5)



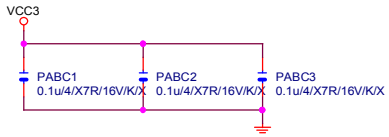
PCH (I)



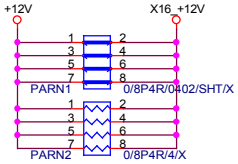
Gigabyte Technology			
Title: PCH PWR ,GND			
Size: Custom	Document Number: GA-H81M-S2PV		Rev: 3.0
Date: Thursday, August 07, 2014		Sheet 13 of 31	

PCIEX16 CAP

N/A



PCIEX16 PROTECT SHT



PCIEX16 AC CAP

PA_EXP_TXP0	PAC5	0.22u/4/X5R/6.3V/K	PA_EXP_TXP0_C
PA_EXP_TXN0	PAC4	0.22u/4/X5R/6.3V/K	PA_EXP_TXN0_C
PA_EXP_TXP1	PAC6	0.22u/4/X5R/6.3V/K	PA_EXP_TXP1_C
PA_EXP_TXN1	PAC7	0.22u/4/X5R/6.3V/K	PA_EXP_TXN1_C
PA_EXP_TXP2	PAC8	0.22u/4/X5R/6.3V/K	PA_EXP_TXP2_C
PA_EXP_TXN2	PAC9	0.22u/4/X5R/6.3V/K	PA_EXP_TXN2_C
PA_EXP_TXP3	PAC10	0.22u/4/X5R/6.3V/K	PA_EXP_TXP3_C
PA_EXP_TXN3	PAC11	0.22u/4/X5R/6.3V/K	PA_EXP_TXN3_C
PA_EXP_TXP4	PAC12	0.22u/4/X5R/6.3V/K	PA_EXP_TXP4_C
PA_EXP_TXN4	PAC13	0.22u/4/X5R/6.3V/K	PA_EXP_TXN4_C
PA_EXP_TXP5	PAC14	0.22u/4/X5R/6.3V/K	PA_EXP_TXP5_C
PA_EXP_TXN5	PAC15	0.22u/4/X5R/6.3V/K	PA_EXP_TXN5_C
PA_EXP_TXP6	PAC16	0.22u/4/X5R/6.3V/K	PA_EXP_TXP6_C
PA_EXP_TXN6	PAC17	0.22u/4/X5R/6.3V/K	PA_EXP_TXN6_C
PA_EXP_TXP7	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]

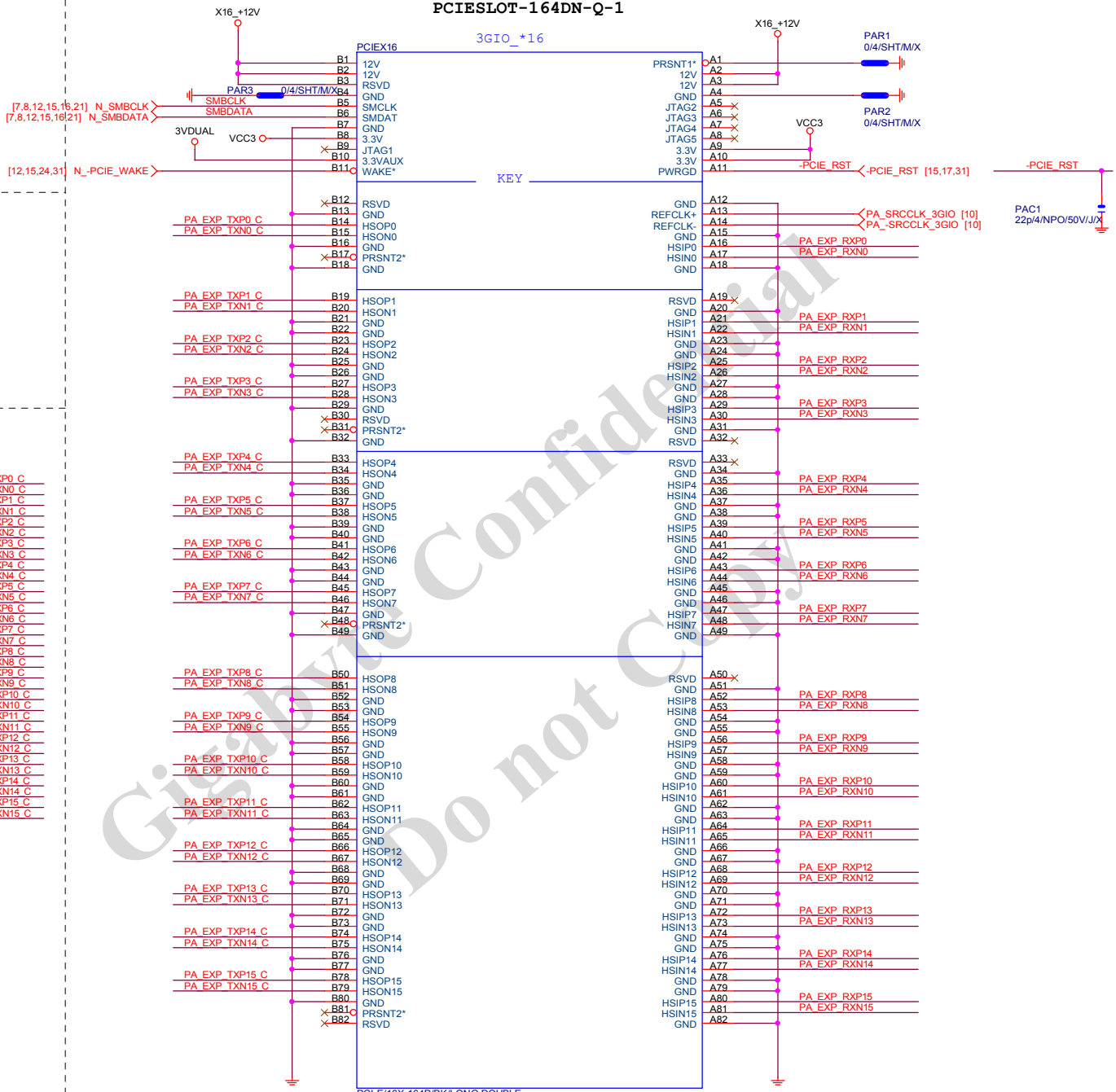
PA_EXP_RXN[0..15] >> PA_EXP_RXN[0..15] [4]

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

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

PCIEX16 SLOT

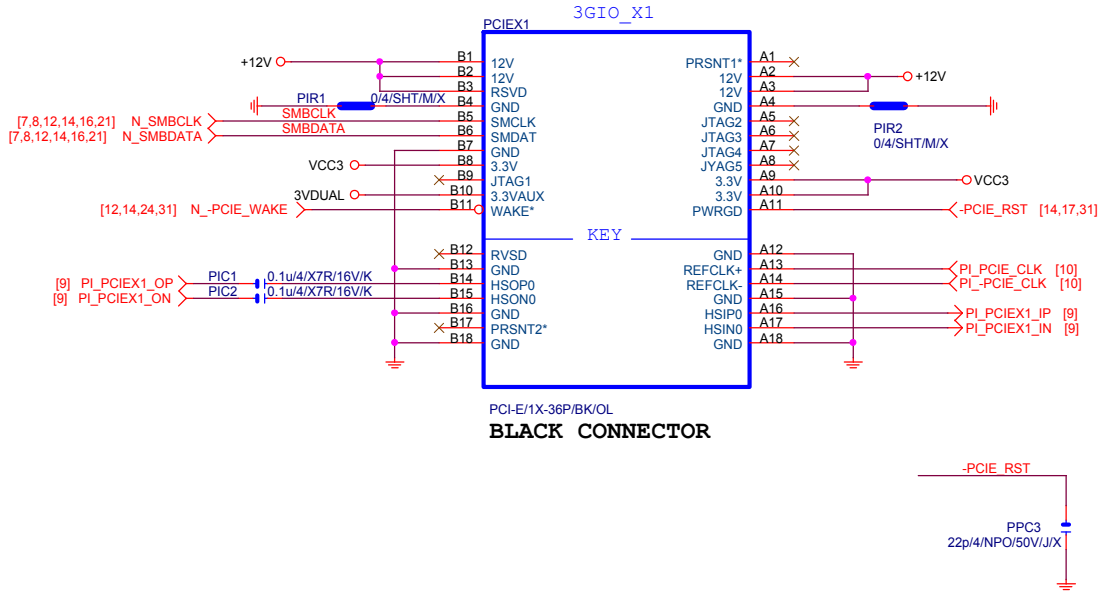
PCIESLOT-164DN-Q-1

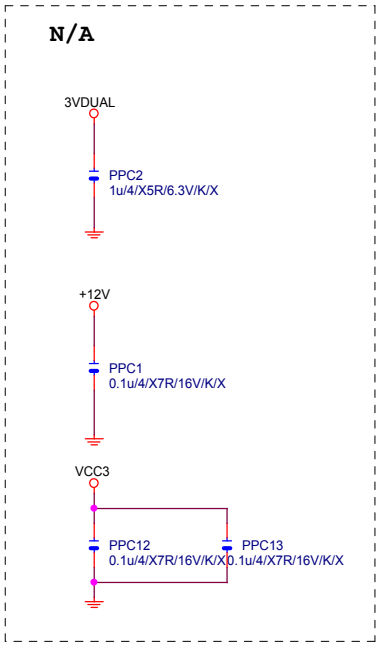


BLACK CONNECTOR

Gigabyte Technology		
Title: PCI EXPRESS * 16		
Size: Custom	Document Number: GA-H81M-S2PV	Rev: 3.0
Date: Thursday, August 07, 2014	Sheet 14 of 31	

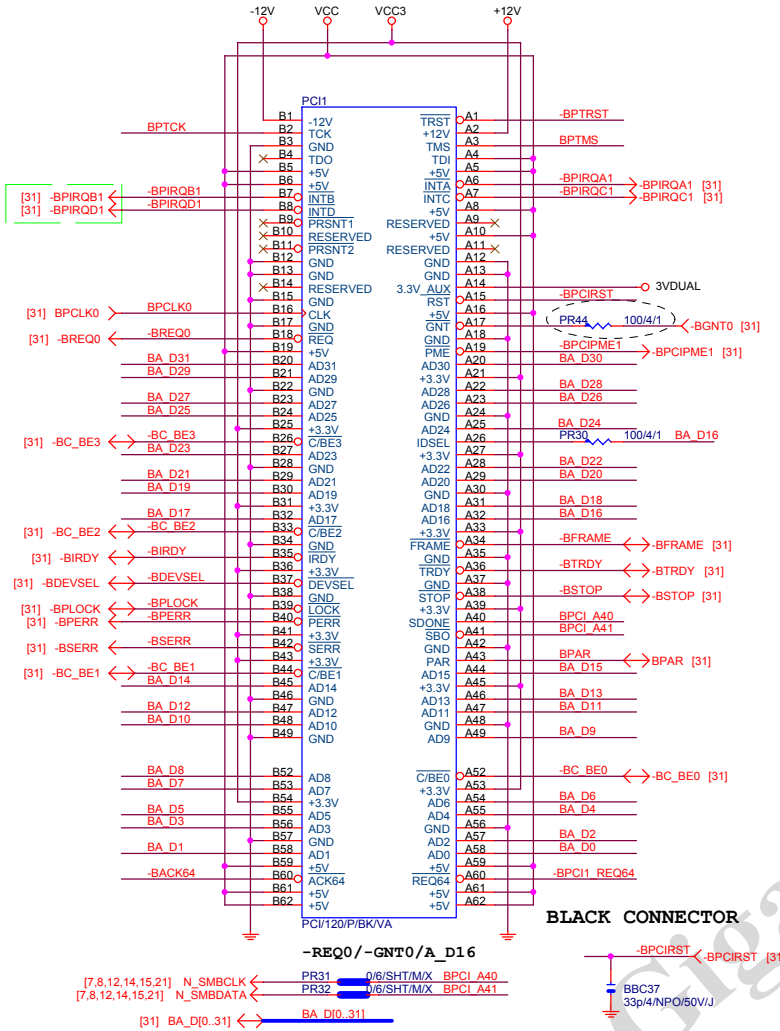
PCIEX1 SLOT



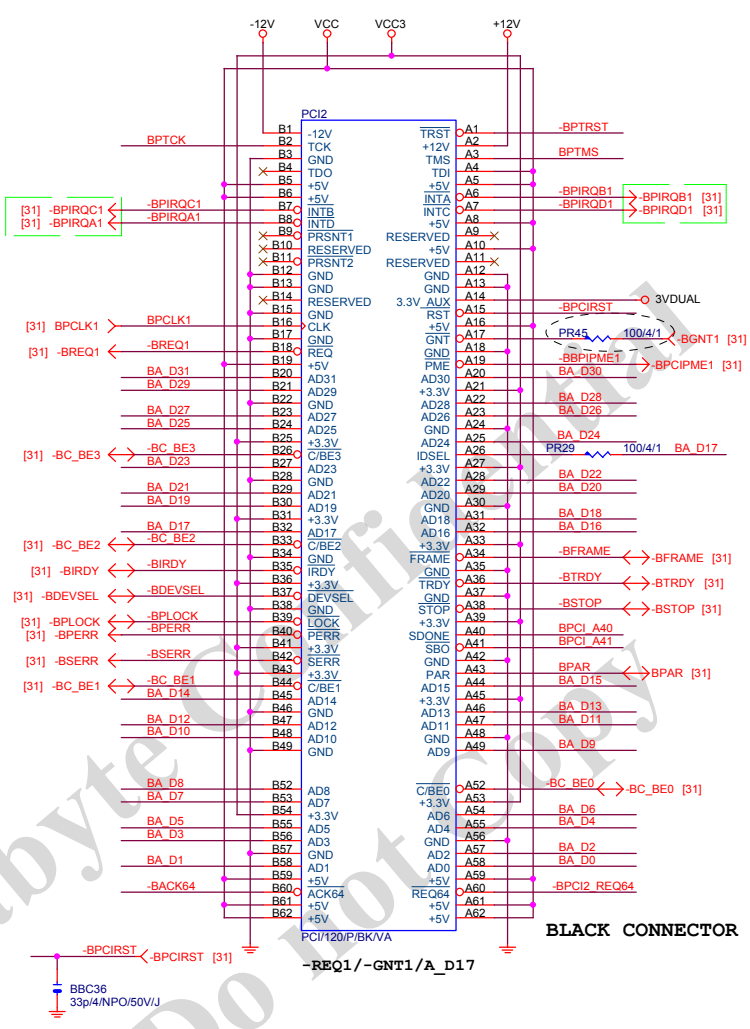


Gigabyte Technology		
Title: PCI EXPRESS X 1 PORT		
Size: Custom	Document Number: GA-H81M-S2PV	Rev: 3.0
Date: Thursday, August 07, 2014	Sheet 15 of 31	

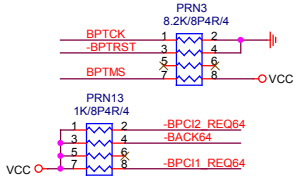
PCI SLOT 1



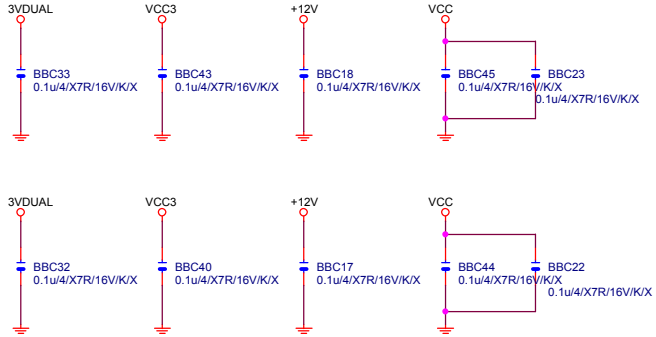
PCI SLOT 2



PCI PU



PCI CAP N/A



Gigabyte Technology		
Title: PCI SLOT 1&2		
Size: Custom	Document Number: GA-H81M-S2PV	Rev: 3.0
Date: Thursday, August 07, 2014	Sheet 16 of 31	

SIO IT8620

IT8620E_BX

IT8620E/CX/S

PWR SHT

SIO PU

SIO STRAP

Power leakage

DUAL BIOS OPT STRAP

SIO_18V

MB ID

SIO CAP

N/A

Title	PCH GPIO , CTRL , AUDIO
Size	C
Document Number	GA-H81M-S2PV
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Gigabyte Technology

COM

AU1
GD75232/TSSOP20
ABC2 0.1u/4/X7R/16V/K/X
ABC1 0.1u/4/X7R/16V/K
ACN2
ACN1
180p/8P4C/6/NPO/50V/K
COM/GE/SC-6mm/RA/1/D/[11NR6-111009-1QR_11NR6-111009-1JR]

KB/MS

KB_MS
FUSEVCC_USB3_R1
BC8 0.1u/4/X7R/16V/K/X
N/A
KB/MS/6P/PC99/OS/RA/D/2
R707 0/6/X
AGND1
RSVD For EMI

COM RI

R90 75K/4/1
Q7 MMBT2222A/SOT23/600mA/40
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/6
CN1
180p/8P4C/6/NPO/50V/K

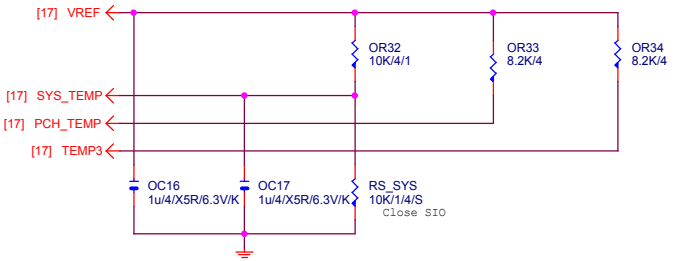
LPT PORT

PRN11 68/8P4R/4
PRN9 68/8P4R/4
PRN7 68/8P4R/4
PD1 CD4148WP/1206/300mA
PBC19 0.1u/4/X7R/16V/K/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

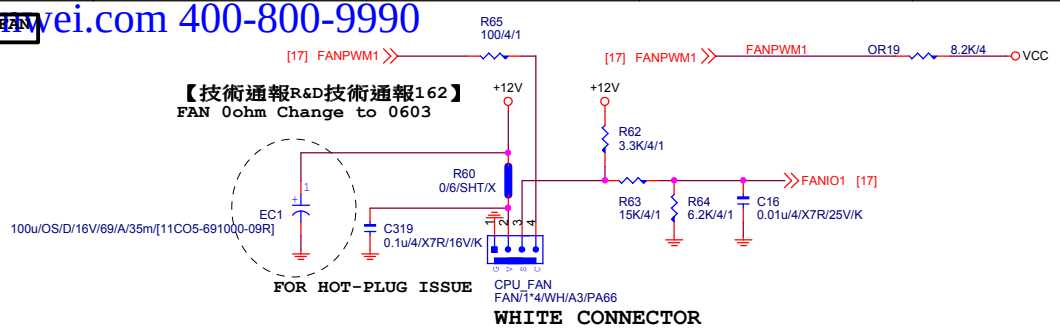
【技術通報R&D技術通報151】
33ohm Change to 68ohm

Gigabyte Technology	
Title	COM,-RI,KB_USB,USB_ESATA,-PROCHOT
Size: Custom	Document Number: GA-H81M-S2PV
Rev	3.0
Date: Thursday, August 07, 2014	Sheet 18 of 31

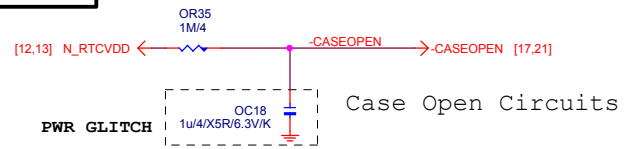
TEMP H/W MONITOR



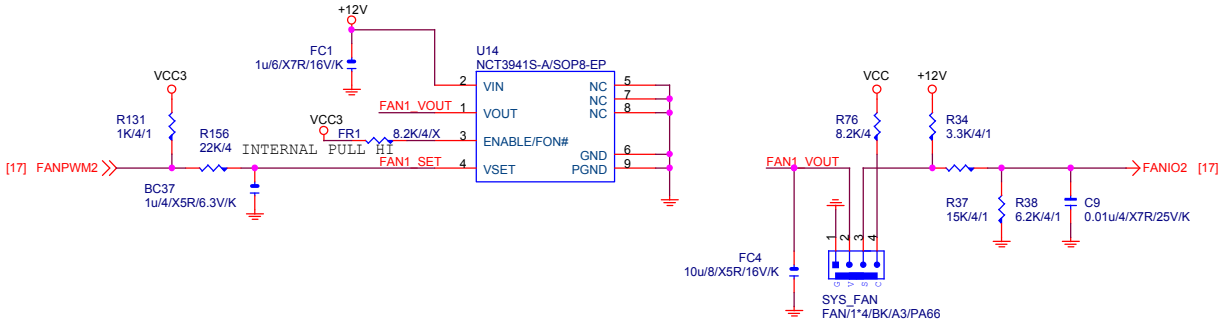
CPU SMART FAN



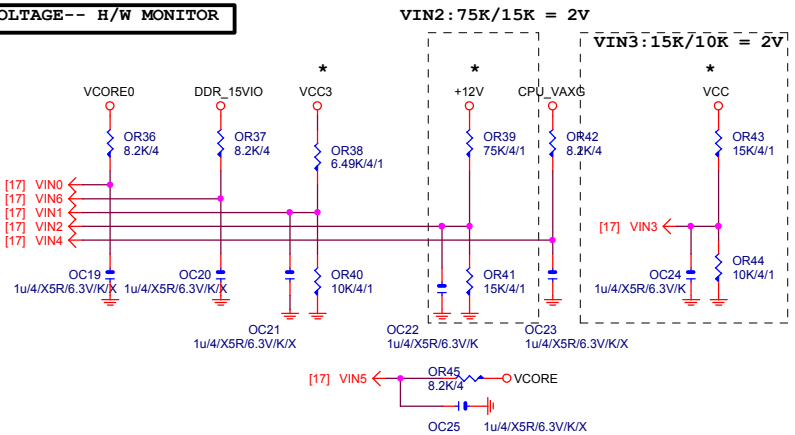
CASE OPEN

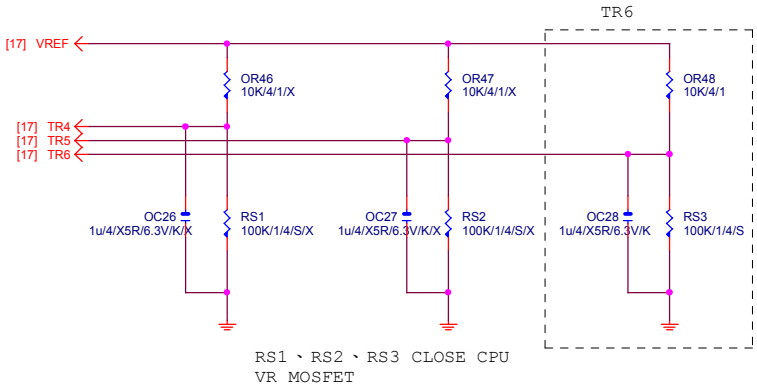


SYS SMART FAN

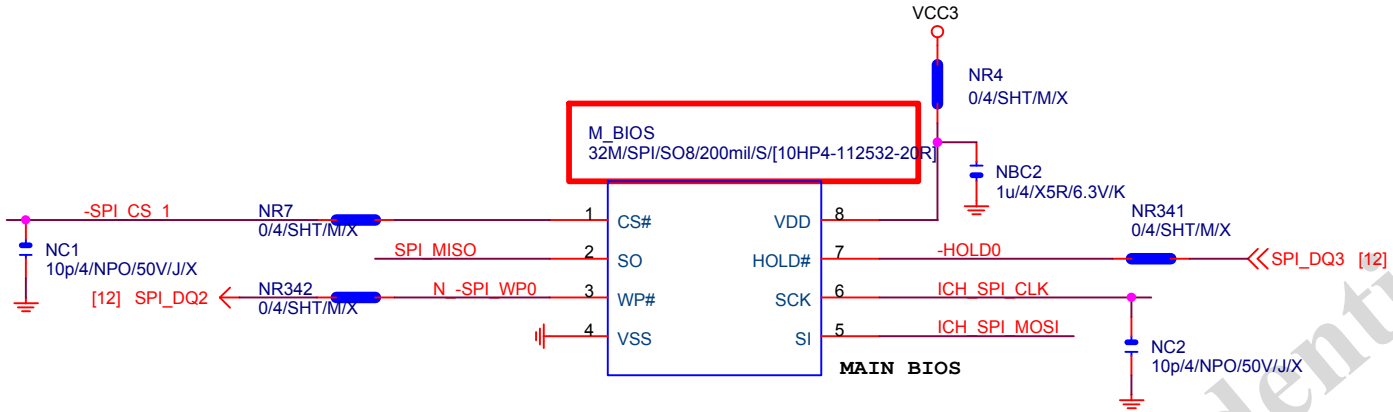


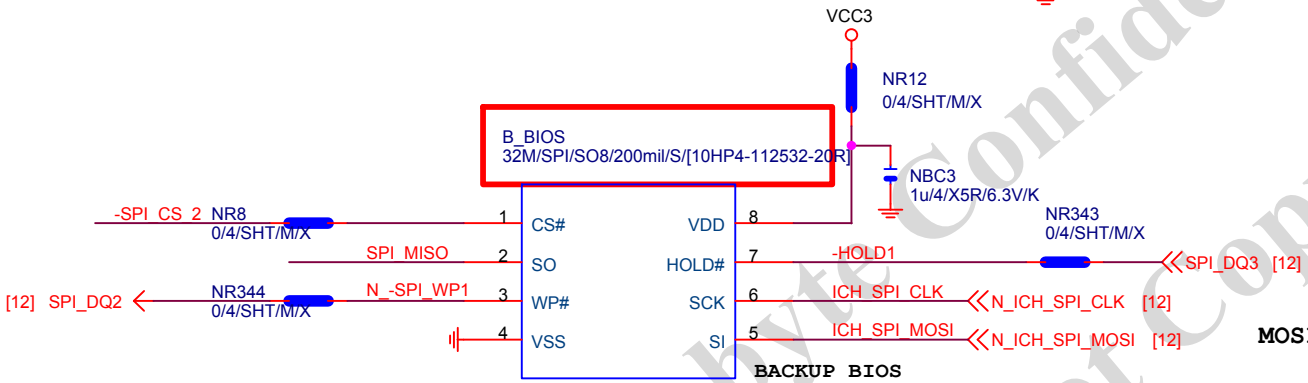
VOLTAGE-- H/W MONITOR





Gigabyte Technology		
Title: HWM,FAN CTRL,OV		
Size: Custom	Document Number: GA-H81M-S2PV	Rev: 3.0
Date: Thursday, August 07, 2014	Sheet 19 of 31	

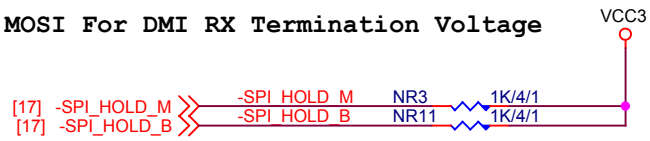


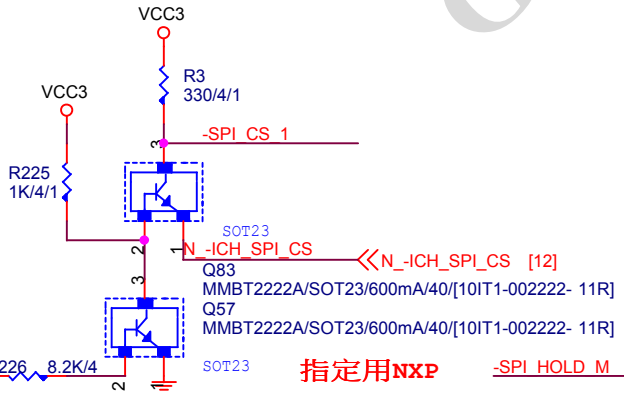


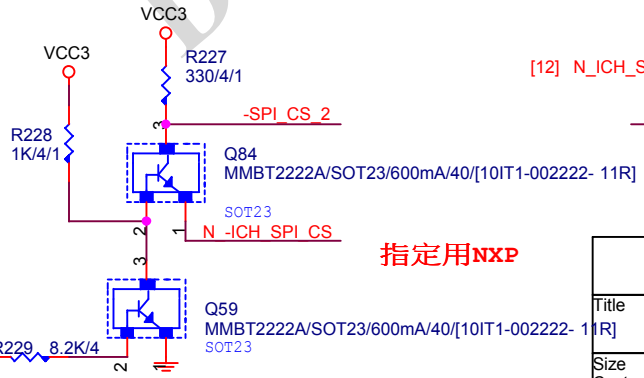
BOOT DEVICE	GNT0	GNT1
LPC	0	0
PCI	0	1
NAND	1	0
SPI	1	1

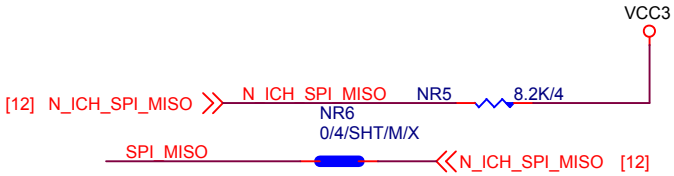
1 means floating
0 means PD 1K

MOSI For DMI RX Termination Voltage









Gigabyte Technology

Title: DUAL BIOS

Size: Custom | Document Number: GA-H81M-S2PV | Rev: 3.0

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USB30_20

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

USB3.0/2.0

FUSEVCC_USB3_R1

[9] N_-USBP0
[9] N_+USBP0

[9] PCH_USB3_RXN0
[9] PCH_USB3_RXP0

[9] PCH_USB3_TXN0
[9] PCH_USB3_TXP0

UBC9 PCH_USB3_TXN0C
UBC10 PCH_USB3_TXP0C

0.1u/4/X7R/16V/K
0.1u/4/X7R/16V/K

[9] N_-USBP1
[9] N_+USBP1

BC6 0.1u/4/X7R/16V/K/X

[9] PCH_USB3_RXN1
[9] PCH_USB3_RXP1

[9] PCH_USB3_TXN1
[9] PCH_USB3_TXP1

UBC11 PCH_USB3_TXN1C
UBC12 PCH_USB3_TXP1C

0.1u/4/X7R/16V/K
0.1u/4/X7R/16V/K

USB30_20_PWR

FUSE-0805

5VDUAL — F11 SPR-P260T/6V/8/S — FUSEVCC_USB3_R1

UEC6 100u/OS/D/6.3V/66/A/35m/[11CO2-661000-09R]

USB3.0 1Port - 1Fuse (2.6A)

USBOC_R

5VDUAL

UR3 8.2K/4

UD5 BAT54A/SOT23/200mA

FUSEVCC_R
FUSEVCC_USB3_R1

N_-USBOC_R
N_-USBOC_R [9]

UR4 15K/4/1

SATA LED

VCC3

FPR12 1K/4/1

[11] N_-SATALED

-HDLED

R431 0/4/SHT/M/X

FPC2 180p/4/NPO/50V/J/X

USB30_20 ESD PROCTECT

USB3.0 ESD

PCH_USB3_TXN1C
PCH_USB3_TXP1C
PCH_USB3_TXP0C
PCH_USB3_TXN0C

UESD5 AZ1045-04F/MSOP10

PCH_USB3_RXN0
PCH_USB3_RXP0
PCH_USB3_RXP1
PCH_USB3_RXN1

UESD6 AZ1045-04F/MSOP10

ESD1

N_-USBP0
N_+USBP1
N_+USBP0
N_-USBP1
FUSEVCC_USB3_R1

AZC099-04S.R7G/SOT23-6L/[10DEF-550099-20R_10TA1-0I8902-10R]

SPKR

VCC

D3 1N4148W/SOD123/300mA

R187 75/4/1
R185 75/4/1
R186 8.2K/4

To disable TCO timer

VCC3 R182 1K/4/1

Q30 MMBT2222A/SOT23/600mA/40

SPKR
N_SPKR [12]

Q29 MMBT2222A/SOT23/600mA/40

VCC R179 1K/4/1
R178 8.2K/4

[17] BEEP-

Q28 2N7002/SOT23/25pF/5

FRONT USB1

FUSEVCC_F FUSEVCC_F

UBC2 0.1u/4/X7R/16V/K

F_USB1

[9] N_-USBP8
[9] N_+USBP8
N_-USBP9 [9]
N_+USBP9 [9]

PH/2*5K9/WH/2.54/VA/D

WHITE CONNECTOR

ESD6

N_-USBP8
N_+USBP9
N_+USBP8
N_-USBP9
FUSEVCC_F

AZC099-04S.R7G/SOT23-6L/[10DEF-550099-20R_10TA1-0I8902-10R]

Close to connector

FUSE-0805

5VDUAL — F1 SPR-P200T/6V/8/S — FUSEVCC_F

UEC1 100u/OS/D/6.3V/66/A/35m/[11CO2-661000-09R]

F_USB1, F_USB2 4-Port 2.0A

FRONT USB2

FUSEVCC_F FUSEVCC_F

UBC4 0.1u/4/X7R/16V/K

F_USB2

[9] N_-USBP10
[9] N_+USBP10
N_-USBP11 [9]
N_+USBP11 [9]

PH/2*5K9/WH/2.54/VA/D

WHITE CONNECTOR

ESD5

N_-USBP10
N_+USBP11
N_+USBP10
N_-USBP11
FUSEVCC_F

AZC099-04S.R7G/SOT23-6L/[10DEF-550099-20R_10TA1-0I8902-10R]

Close to connector

USB POWER PROTECT

[11] N_GPIO1

UAD5 BAT54A/SOT23/200mA/X

N_-USBOC_F
N_-USBOC_R
N_-USBOC_F [9]

N/A

-USBOC_F

FUSEVCC_F

UR1 8.2K/4

N_-USBOC_F
N_-USBOC_F [9]

UR2 15K/4/1

INTEL FRONT PANEL

VCC3

R168 150/6

BC78 0.01u/4/X7R/25V/K/X

VCC

R171 330/6

[17] MPD+
MPD+

F_PANEL

HD+
-HDLED
[12] N_-SYS_RST
[7,19] -CASEOPEN
MPD+

R181 100/4/1

BC75 0.01u/4/X7R/25V/K

HD+ MSG/PD+ MPD+
HD- MSG/PD- MPD- [17]
GND PW+ -PWRBT_1
-RST RESET PW-
CI-
CI+
SP+ VCC
PWR+ NC
PWR- NC
PWR- SP- SPK-

PH/2*10K10,12,13/WH/2.54/VA/D

3VDUAL_PCH

R172 8.2K/4
R175 33/4

-PWRBTSW [17]

BC67 0.01u/4/X7R/25V/K

PIN2X10PANEL_NEW

FPESD1

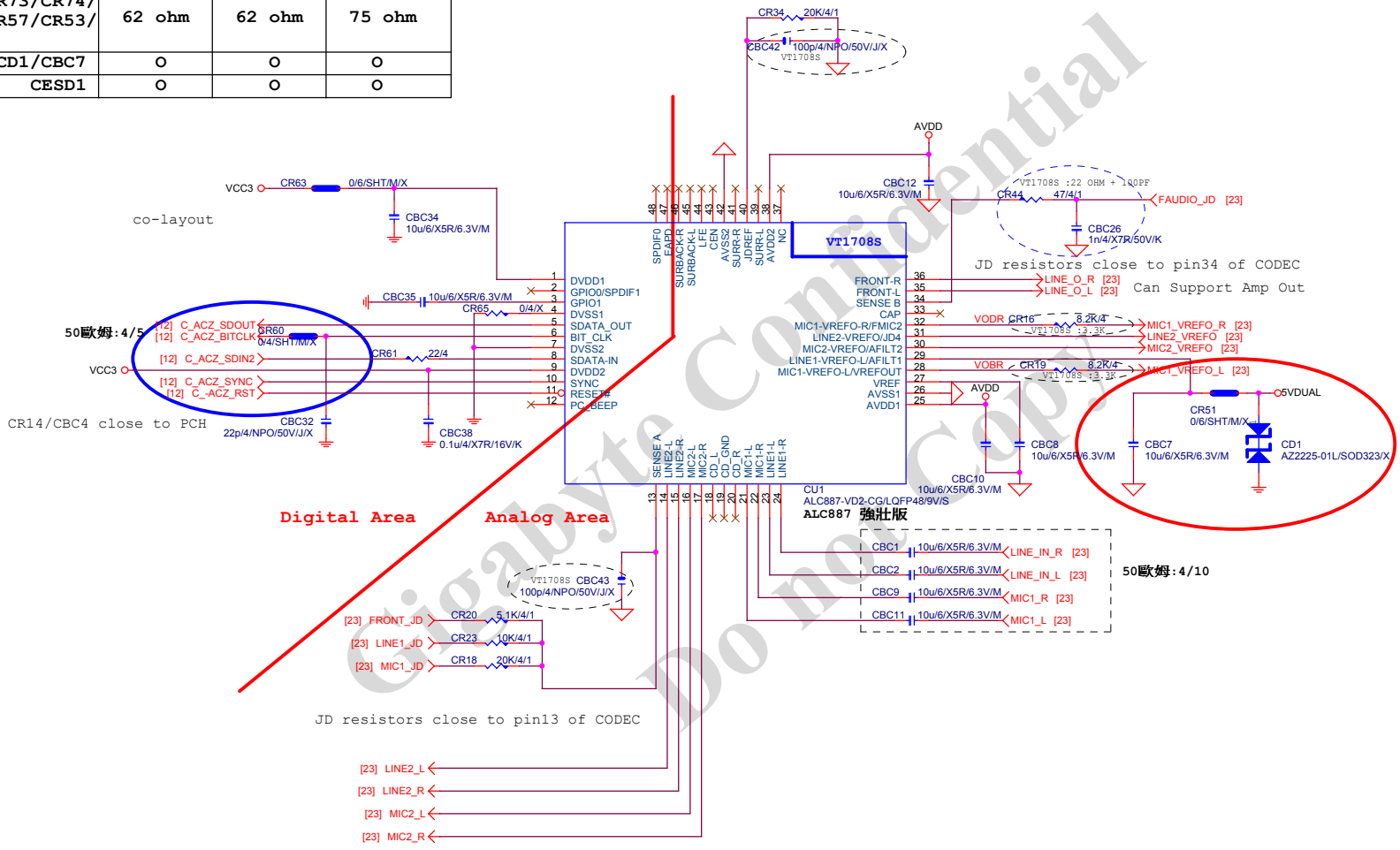
[7,8,12,14,15,16] N_SMBCLK
[7,8,12,14,15,16] N_SMBDATA
N_SMBCLK
N_SMBDATA
-RST
-PWRBT_1
3VDUAL_PCH

AZC099-04S.R7G/SOT23-6L/[10DEF-550099-20R_10TA1-0I8902-10R]

Gigabyte Technology			
Title: FP,F_USB,USB PWR,SPKR,SATA LED			
Size: Custom	Document Number: GA-H81M-S2PV		Rev: 3.0
Date: Thursday, August 07, 2014	Sheet 21 of 31		

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



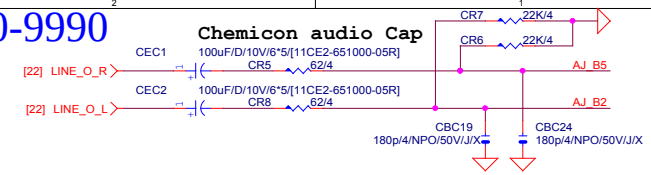
Gigabyte Technology

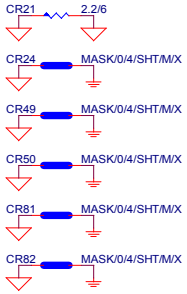
Title: HD AUDIO ALC887B-VD2/VT1708S/VT2021

Size: Custom | Document Number: GA-H81M-S2PV | Rev: 3.0

Date: Thursday, August 07, 2014 | Sheet 22 of 31

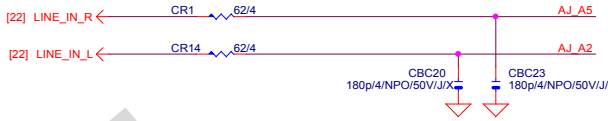
LINE-OUT





Only reserved for ALC888

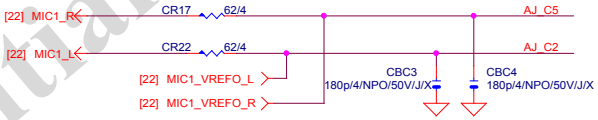
LINE-IN



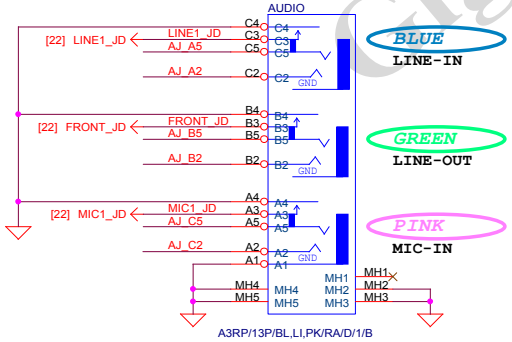
Verify MIC function in LINE-in

For 889A/888

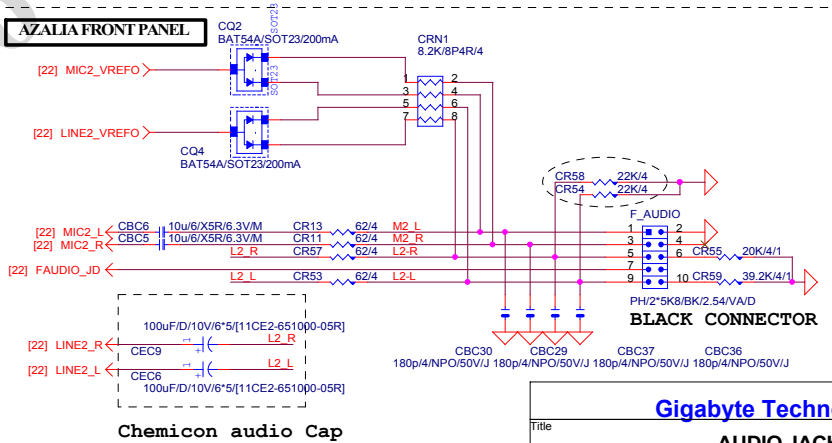
MIC-IN



SPDIF_OUT

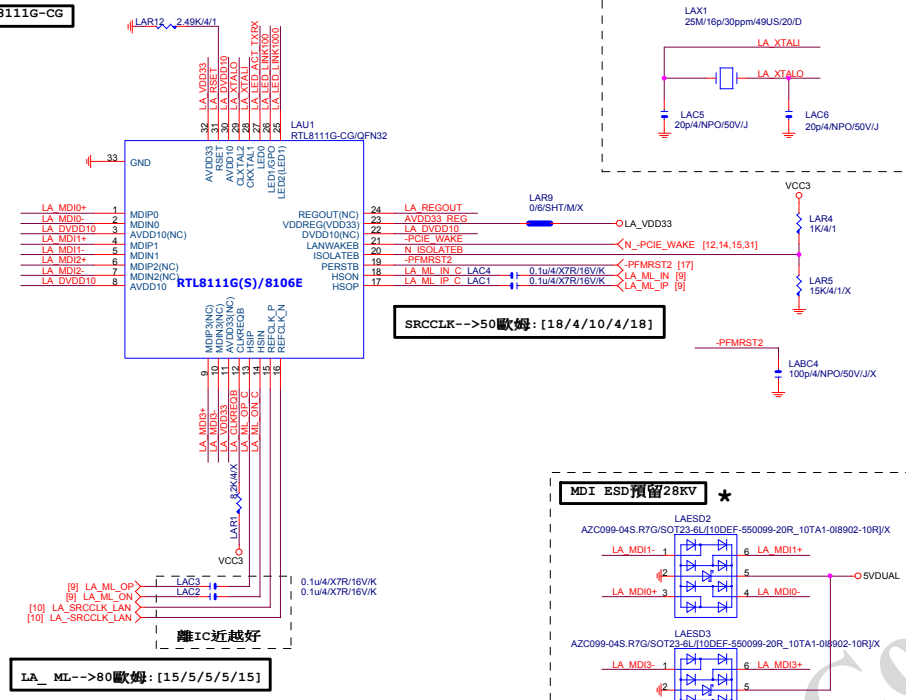


AZALIA FRONT PANEL



Gigabyte Technology			
Title: AUDIO JACK			
Size: Custom	Document Number: GA-H81M-S2PV		Rev: 3.0
Date: Thursday, August 07, 2014		Sheet 23 of 31	

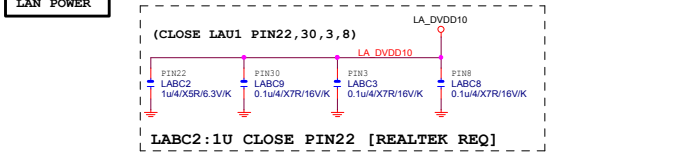
LAN RTL8111G-CG

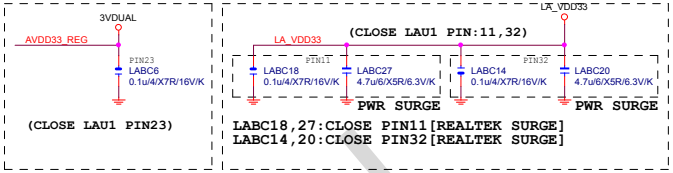


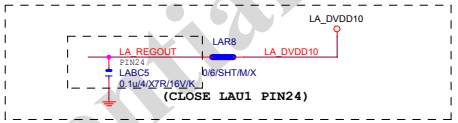
SRCCLK-->50歐姆:[18/4/10/4/18]

LA_ ML-->80歐姆:[15/5/5/5/15]

LAN POWER

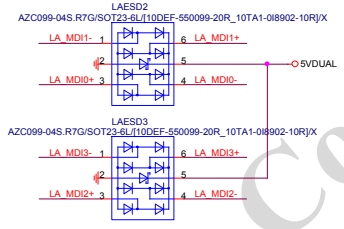






NOTE:
RT8106E:PIN3,11,22,24-->NC
LABC2LABC3,LABC5,LABC18,LABC27-->N/A

MDI ESD預留28KV ★



BOM NOTICE ★

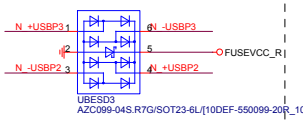
料號	規格	廠商
11NR6-702009-96R	1G LAN (12core)	UDE(RU9 ESD+)

[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

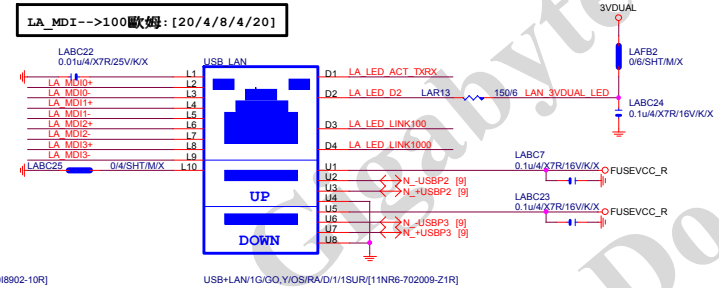
USB_LAN CONNECTOR

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]

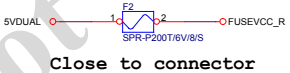


USB+LAN/1G/GO,Y/OS/RA/D/1/1SUR/[11NR6-702009-Z1R]

Surge加強RJ45 connector

USB POWER

FUSE-0805



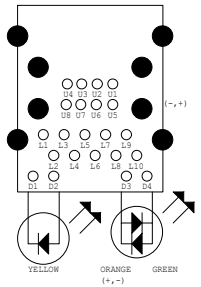
Close to connector

USB_LAN 2-Port 2.0A

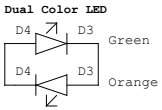
EMI SHORT PAD

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: 3.0
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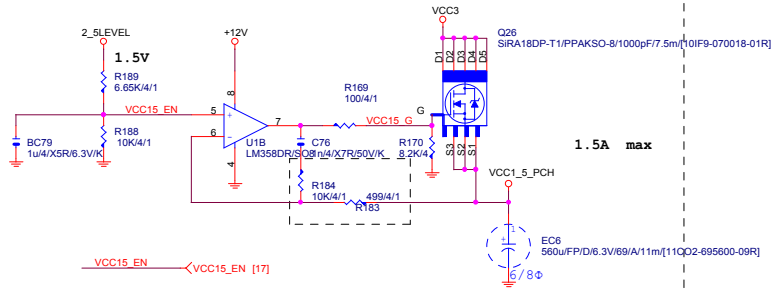
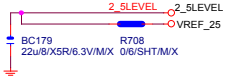
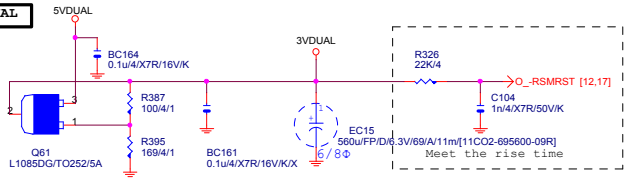
VCC1_5_PCH



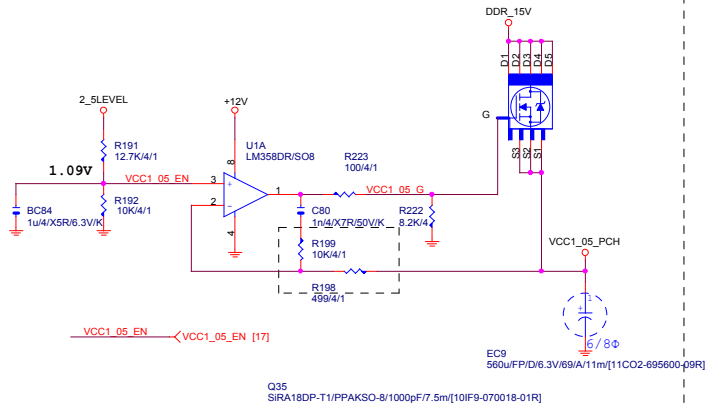
2_5LEVEL



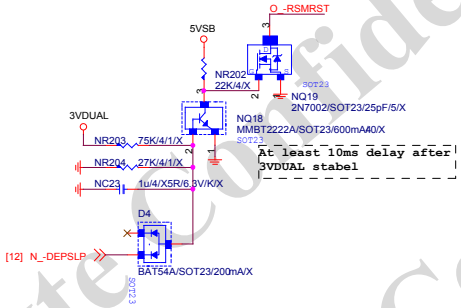
3VDUAL



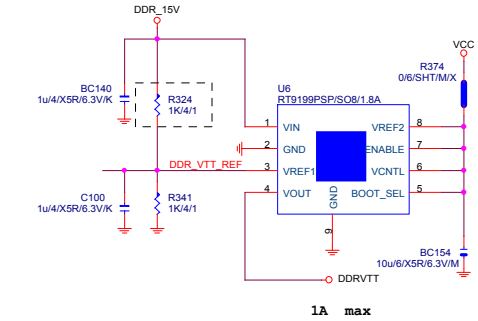
VCC1_05_PCH



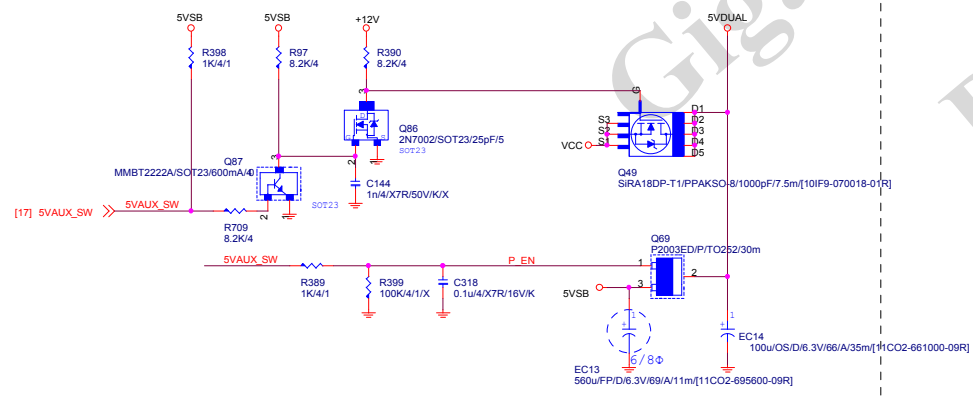
N/A



DDRVTT



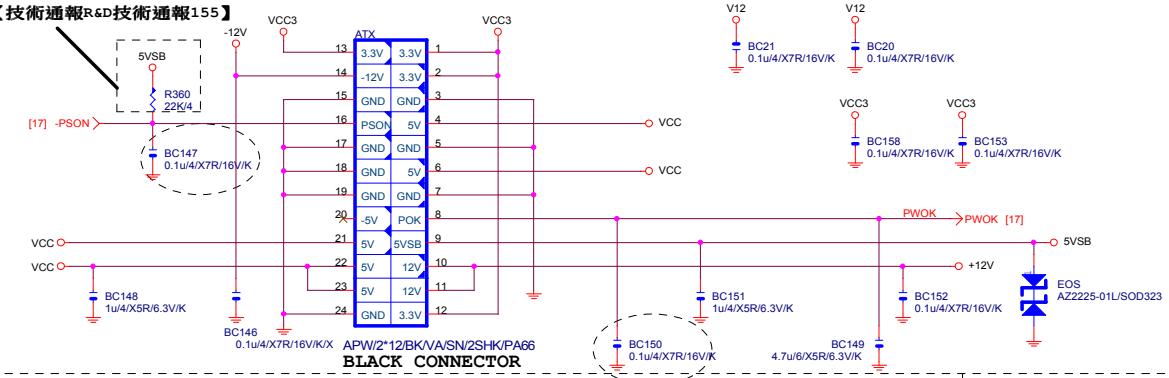
5VDUAL



Gigabyte Technology		
Title: DISCRETE POWER		
Size: Custom	Document Number: GA-H81M-S2PV	Rev: 3.0
Date: Thursday, August 07, 2014	Sheet 25 of 31	

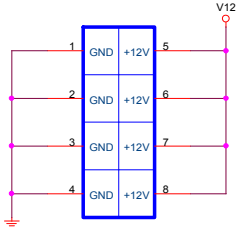
ATXX24 POWER CONNECTOR

【技術通報R&D技術通報155】



BLACK CONNECTOR

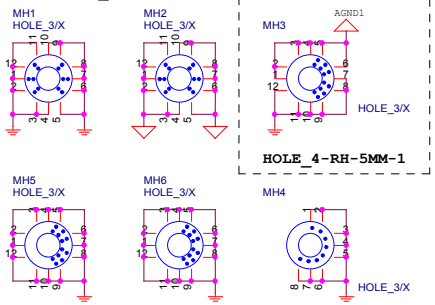
ATXX4 POWER CONNECTOR



ATX_12V_2X4
APW/2*4/BK/OC/P/4.2/VA/SN/OH::Location ATX_12V_2X4

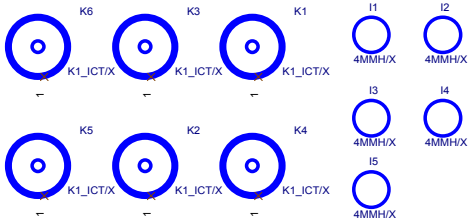
BLACK CONNECTOR

HOLE_4-RH-1



HOLE_4-RH-5MM-1

HOLE_4-RH-5MM-5PIN-1

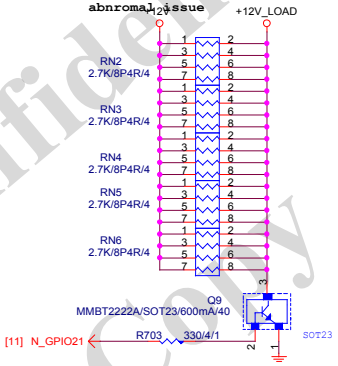


To prevent the 5VSB under loading when boot

HOLE_4-RH-5MM-1

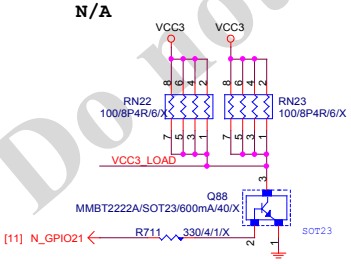
【技術通報R&D技術通報153】

To fix 12V light load abnromal issue

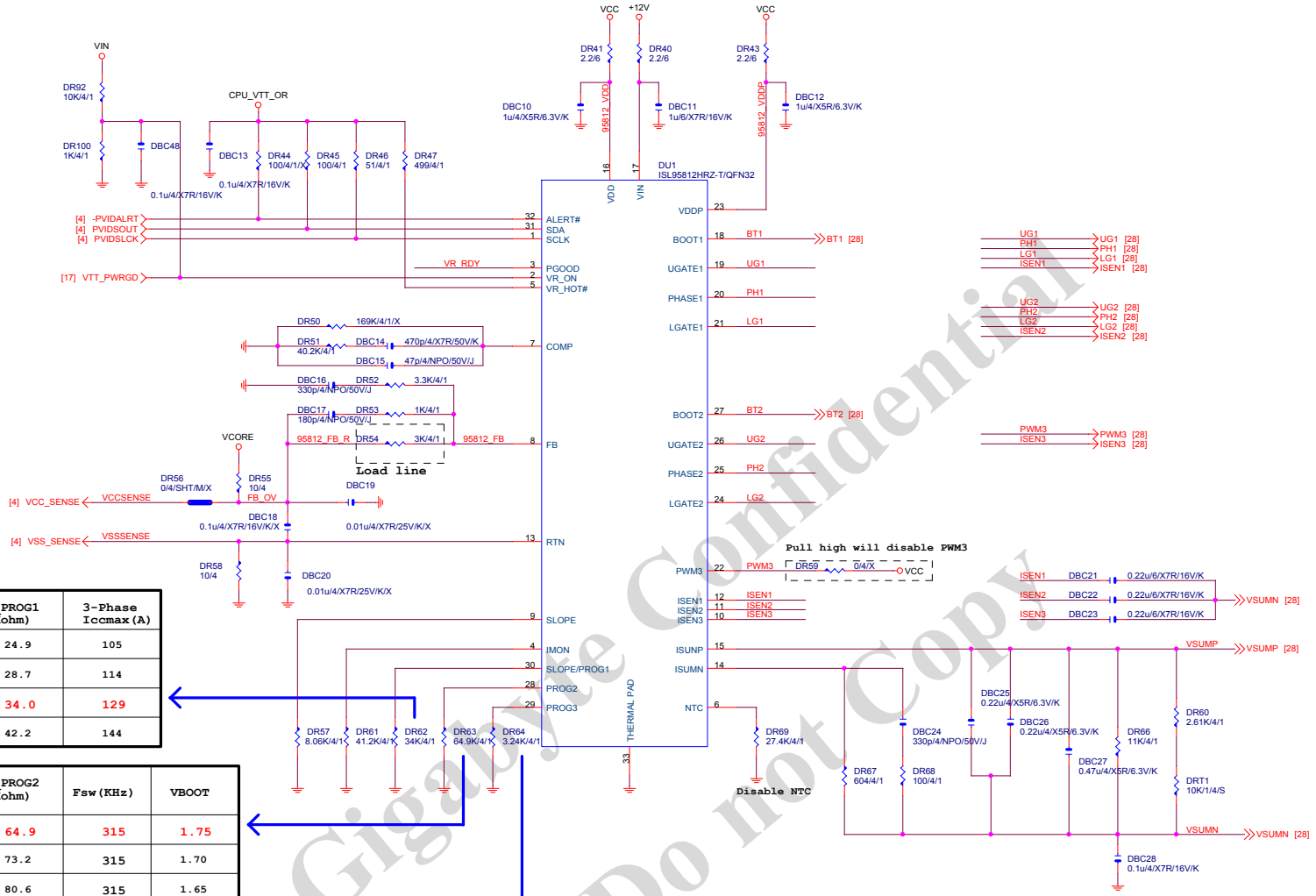


FIX PWR MINMUN LOAD

N/A



Gigabyte Technology			
Title: ATX CONNECTOR			
Size: Custom	Document Number: GA-H81M-S2PV		Rev: 3.0
Date: Thursday, August 07, 2014	Sheet 26 of 31		



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: 3.0
Date: Thursday, August 07, 2014	Sheet 27 of 31	

PHASE 1

UG1 PH1 LG1 → UG1 [27] PH1 [27] LG1 [27]

[1]

VIN DAC1 1u/6/X7R/16V/K
UG1 DAR1 2.2/6 UG1_1
DAR2 8.2K/4
PH1
LG1 LG1_1 DAR3 0/6/SHT/M/X
DAC2 0.22u/6/X7R/16V/K
DAR6 2.2/6
DAC3 1n/4/X7R/50V/K
DAR8 0/6/SHT/M/X
[27] BT1

DAQ1 SiRA14DP-T1/PPAKSO-8/1450pF/5.1m/[10IF9-050014-01R]
DAQ2 SiRA14DP-T1/PPAKSO-8/1450pF/5.1m/[10IF9-050014-01R]
DAQ3 MASK/SiRA14DP-T1/PPAKSO-8/1450pF/5.1m/[10IF9-050014-01R]
MASK
DAL1 0.68uH/40A/IMD119/M/D
DAR4 0/4/SHT/M/X
DAR5 0/4/SHT/M/X
VCORE
[27] VSUMP VSUMP DAR7 3.6K/4/1
[27] ISEN1 ISEN1 DAR9 10K/4/1
[27] VSUMN VSUMN DAR10 10/4 V1N
ISEN2 DAR11 10K/4/1
ISEN3 DAR12 10K/4/1
Close to PWM

PHASE 3

VCC DCR13 1/6 DCR14 1/6 DCC4 1u/6/X7R/16V/K DCC5 0.1u/4/X7R/16V/K
DCU1 ISL6208BCRZ/DFN8/[10TA1-606208-21R]
BOOT PVCC 6609_VCC PWM3 GND UGATE PHASE LGATE
UG3 PH3 LG3
PWM3 → PWM3 [27]

[3]

VIN DCC1 1u/6/X7R/16V/K
UG3 DCR1 2.2/6 UG3_1
DCR2 8.2K/4
PH3
LG3 LG3_1 DCR3 0/6/SHT/M/X
DCC2 0.22u/6/X7R/16V/K
DCR6 2.2/6
DCC3 1n/4/X7R/50V/K
DCR8 0/6/SHT/M/X
BOOT

DCQ1 SiRA14DP-T1/PPAKSO-8/1450pF/5.1m/[10IF9-050014-01R]
DCQ2 SiRA14DP-T1/PPAKSO-8/1450pF/5.1m/[10IF9-050014-01R]
DCQ3 MASK/SiRA14DP-T1/PPAKSO-8/1450pF/5.1m/[10IF9-050014-01R]
MASK
DCL1 0.68uH/40A/IMD119/M/D
DCR4 0/4/SHT/M/X
DCR5 0/4/SHT/M/X
VCORE
[27] VSUMP VSUMP DCR7 3.6K/4/1
[27] ISEN3 ISEN3 DCR9 10K/4/1
[27] VSUMN VSUMN DCR10 10/4 V3N
ISEN1 DCR11 10K/4/1
ISEN2 DCR12 10K/4/1
Close to PWM

PHASE 2

UG2 PH2 LG2 → UG2 [27] PH2 [27] LG2 [27]

[2]

VIN DBC1 1u/6/X7R/16V/K
UG2 DBR1 2.2/6 UG2_1
DBR2 8.2K/4
PH2
LG2 LG2_1 DBR3 0/6/SHT/M/X
DBC2 0.22u/6/X7R/16V/K
DBR6 2.2/6
DBC3 1n/4/X7R/50V/K
DBR8 0/6/SHT/M/X
[27] BT2

DBQ1 SiRA14DP-T1/PPAKSO-8/1450pF/5.1m/[10IF9-050014-01R]
DBQ2 SiRA14DP-T1/PPAKSO-8/1450pF/5.1m/[10IF9-050014-01R]
DBQ3 MASK/SiRA14DP-T1/PPAKSO-8/1450pF/5.1m/[10IF9-050014-01R]
MASK
DBL1 0.68uH/40A/IMD119/M/D
DBR4 0/4/SHT/M/X
DBR5 0/4/SHT/M/X
VCORE
[27] VSUMP VSUMP DBR7 3.6K/4/1
[27] ISEN2 ISEN2 DBR9 10K/4/1
[27] VSUMN VSUMN DBR10 10/4 V2N
ISEN1 DBR11 10K/4/1
ISEN3 DBR12 10K/4/1
Close to PWM

VCORE
MASK MASK
DEC2 DEC3 DEC4 DEC5 DEC6 DEC7
560u/FP/D/6.3V/69/A/11m/[11CO2-695600-09R]
560u/FP/D/6.3V/69/A/11m/[11CO2-695600-09R]
560u/FP/D/6.3V/69/A/11m/[11CO2-695600-09R]
MASK/560u/FP/D/6.3V/69/A/11m/[11CO2-695600-09R]/X
560u/FP/D/6.3V/69/A/11m/[11CO2-695600-09R]
MASK/560u/FP/D/6.3V/69/A/11m/[11CO2-695600-09R]/X

V12 VIN
MASK
DBC46 1u/6/X7R/16V/K DEC10 DEC11 DEC12
270u/FP/D/16V/8C/A/10m/[11CO5-8C2700-09R]
MASK/270u/FP/D/16V/8C/A/10m/[11CO5-8C2700-09R]/X
270u/FP/D/16V/8C/A/10m/[11CO5-8C2700-09R]

Gigabyte Technology		
Title: CPU CORE VR-2		
Size: Custom	Document Number: GA-H81M-S2PV	Rev: 3.0
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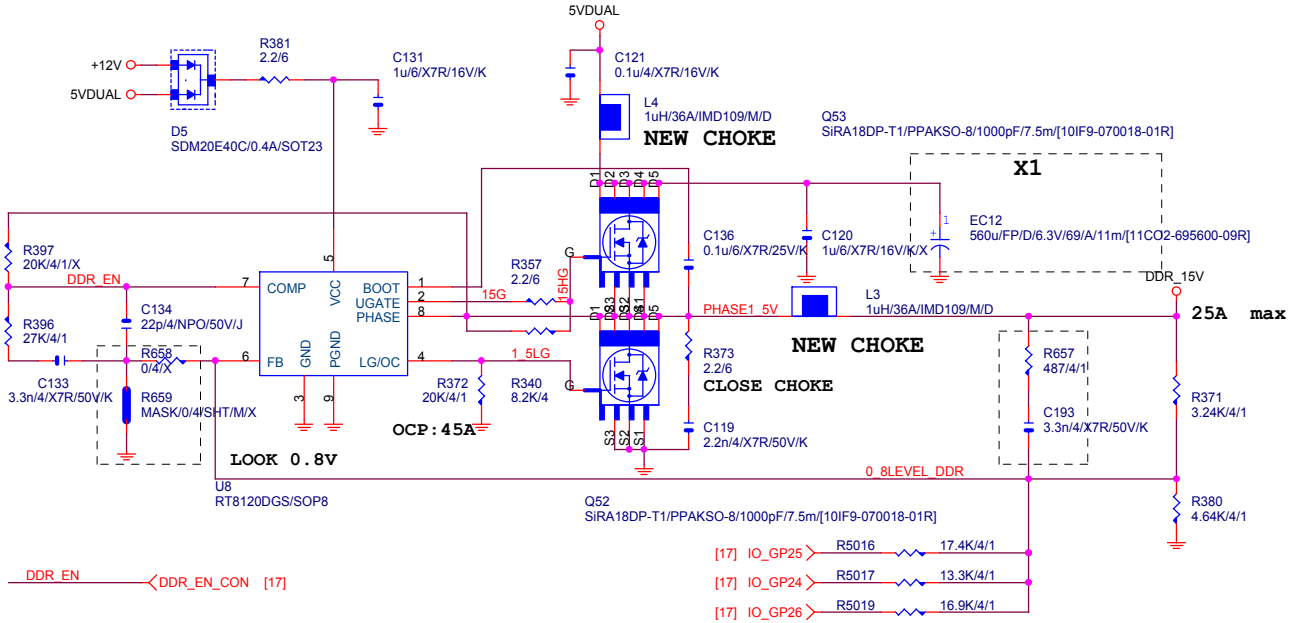
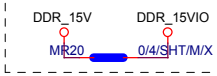
DDR15V



From DDR_15V source
10 mils trace to SIO



PWR SEQ

GP26	H	L	L	L
GP25	H	H	L	H
GP24	H	H	H	L
	1.35V	1.50V	1.65V	1.70V

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

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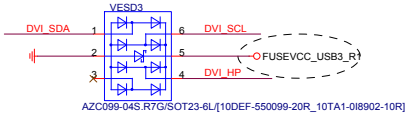
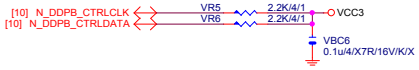
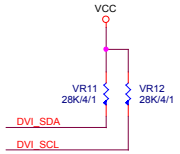
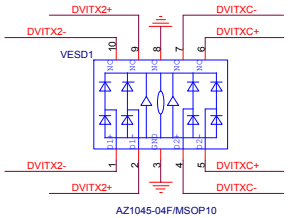
DVI



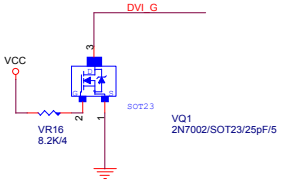
Close to connector

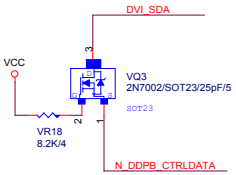


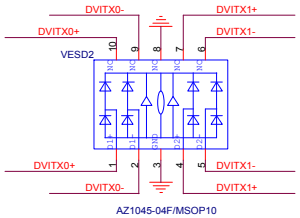




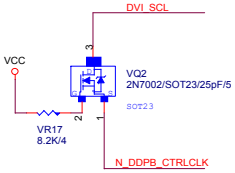
Close to connector

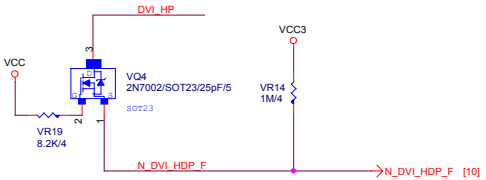


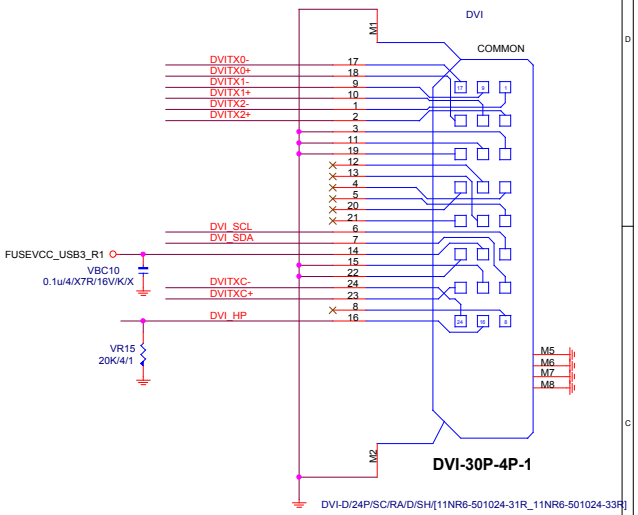




Close to connector







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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

PU1 IT8892E/BX LQFP128

IT8892E/FX/S

IT8892

PCI slot

PCI slot

chipset side

PCB layout note: Close to chip

PCB layout note: Close to chip

Close to chip

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