Model Name: GA-H81M-H

Revision 1.1

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

SHEET	TITLE
28	RT8120_DDR POWER
29	HDMI
30	
31	
32	

Gigabyte Technology

Title: Cover Sheet

Size: Custom | Document Number: GA--H81M-H | Rev: 1.1

Date: Thursday, October 31, 2013 | Sheet 1 of 29

Model Name: GA-H81M-H

Component value change history

2013/07/04

Data	Change Item	Reason
2013/07/04	1. Change from H81M-S1 (H81M-S1-R03_2013_0626-1010.DSN)	9MH81MH-00-01
2013/08/16	1. Remove WR57	9MH81MH-00-10C

Circuit or PCB layout change

DATE	Change Item	Reason
2013/07/04	1. Change from H81M-S1 Rev 0.2 add HDMI	Rev 0.1
2013/07/30	1. Fix Power issue	Rev 1.0
2013/09/28	1. Add TPM	Rev 1.1

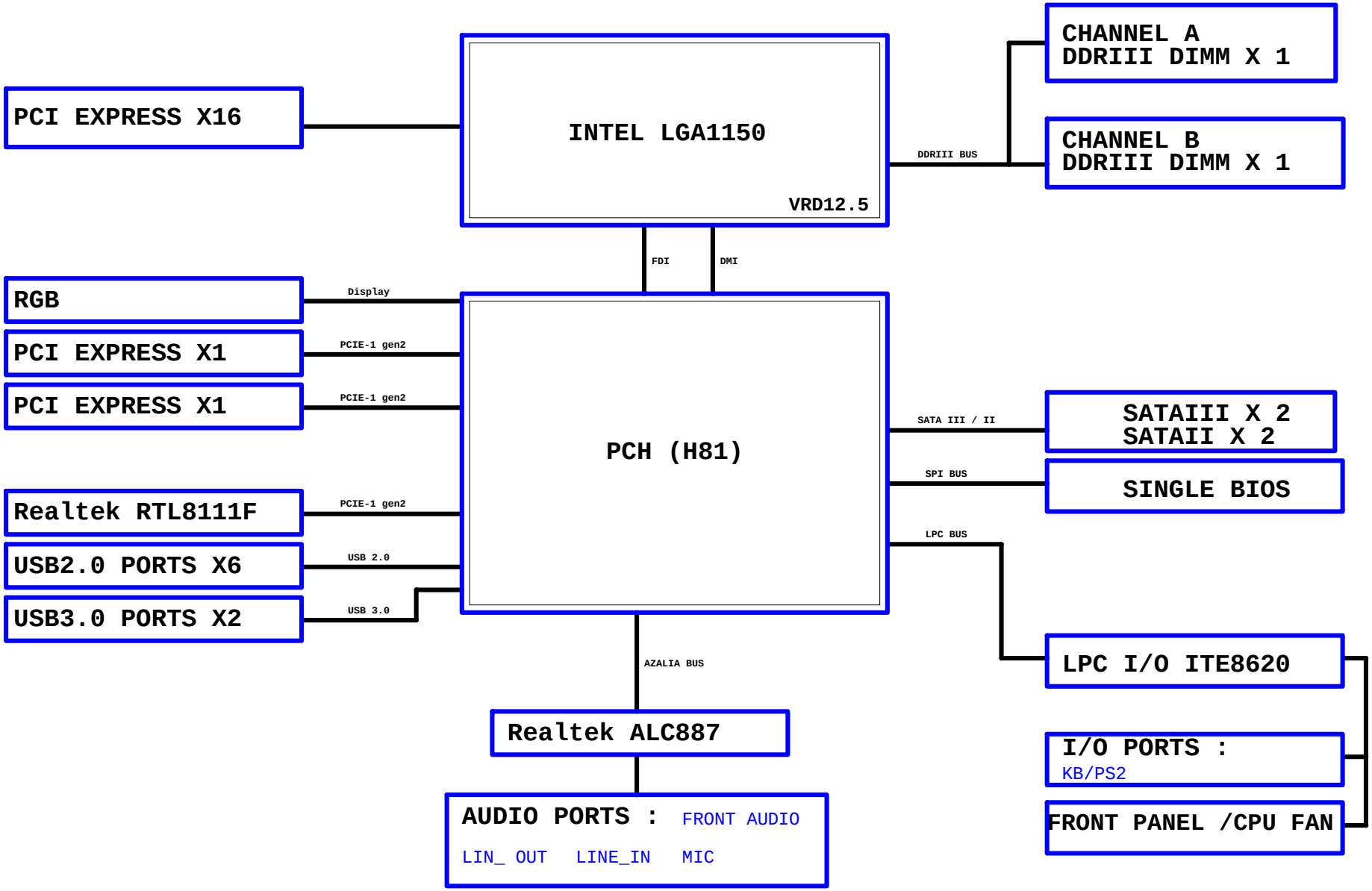
Gigabyte Technology

Title: BOM & PCB MODIFY HISTORY

Size: Custom | Document Number: GA--H81M-H | Rev: 1.1

Date: Thursday, October 31, 2013 | Sheet 2 of 29

BLOCK DIAGRAM



Gigabyte Technology		
Title: BLOCK DIAGRAM		
Size: C	Document Number: GA--H81M-H	Rev: 1.1
Date: Thursday, October 31, 2013	Sheet 3 of 29	

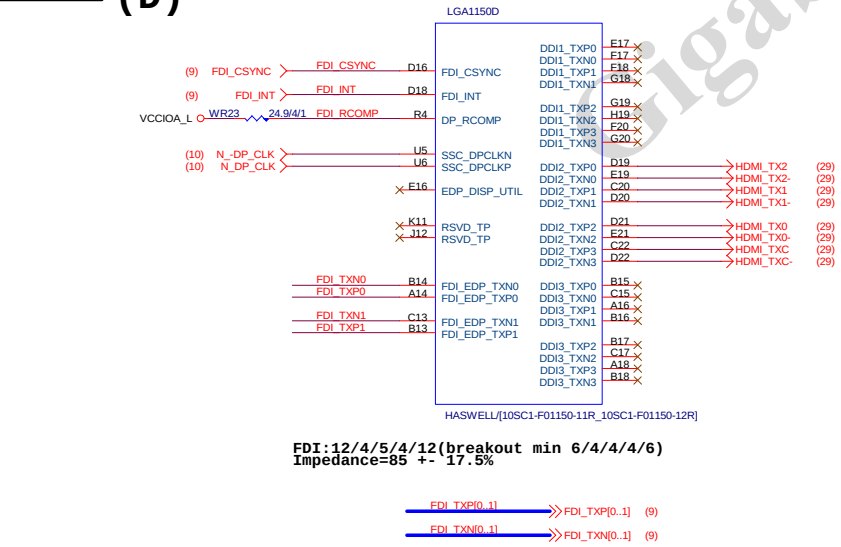
LGA1150 (E)

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)



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

FDI_TXP[0..1] FDI_TXP[0..1] (9)
FDI_TXN[0..1] FDI_TXN[0..1] (9)

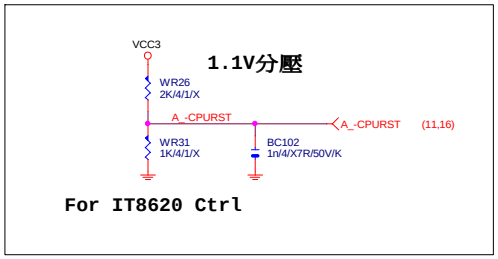
LGA1155 (C)

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

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

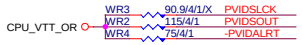
PA_EXP_TXP[0..15] PA_EXP_TXP[0..15] (14)
PA_EXP_TXN[0..15] PA_EXP_TXN[0..15] (14)
PA_EXP_RXP[0..15] PA_EXP_RXP[0..15] (14)
PA_EXP_RXN[0..15] PA_EXP_RXN[0..15] (14)

-CPURST

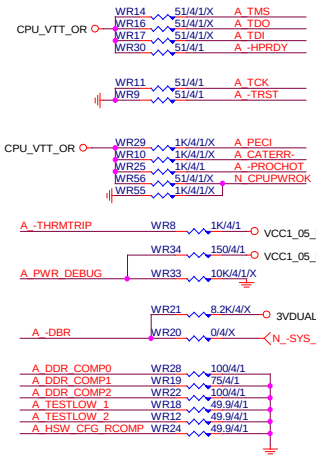


For IT8620 Ctrl

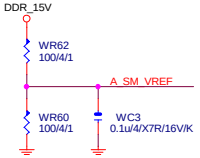
CPU SVID



CPU PU/PD



SM REF



Gigabyte Technology

Title	CPU LGA1150-A	
Size: Custom	Document Number: GA--H81M-H	Rev: 1.1
Date: Thursday, October 31, 2013	Sheet 4 of 29	

LGA1150 (A)

LGA1150A

MAAA0	AU13	DDR0_MA0	DDR0_DQ0	AD38	MDA0
MAAA1	AV16	DDR0_MA1	DDR0_DQ1	AD39	MDA1
MAAA2	AU16	DDR0_MA2	DDR0_DQ2	AF38	MDA2
MAAA3	AW17	DDR0_MA3	DDR0_DQ3	AF39	MDA3
MAAA4	AU17	DDR0_MA4	DDR0_DQ4	AD37	MDA4
MAAA5	AW18	DDR0_MA5	DDR0_DQ5	AD40	MDA5
MAAA6	AV17	DDR0_MA6	DDR0_DQ6	AE37	MDA6
MAAA7	AT18	DDR0_MA7	DDR0_DQ7	AF40	MDA7
MAAA8	AU18	DDR0_MA8	DDR0_DQ8	AH40	MDA8
MAAA9	AT19	DDR0_MA9	DDR0_DQ9	AH39	MDA13
MAAA10	AW11	DDR0_MA10	DDR0_DQ10	AK38	MDA10
MAAA11	AV19	DDR0_MA11	DDR0_DQ11	AK39	MDA11
MAAA12	AU19	DDR0_MA12	DDR0_DQ12	AH37	MDA12
MAAA13	AY10	DDR0_MA13	DDR0_DQ13	AH38	MDA8
MAAA14	AT20	DDR0_MA14	DDR0_DQ14	AK37	MDA14
MAAA15	AU21	DDR0_MA15	DDR0_DQ15	AK40	MDA15
			DDR0_DQ16	AM40	MDA17
MODT_A0	AW10	DDR0_ODT0	DDR0_DQ17	AM39	MDA21
MODT_A1	AY8	DDR0_ODT1	DDR0_DQ18	AP38	MDA18
	AW9	DDR0_ODT2	DDR0_DQ19	AP39	MDA19
	AU8	DDR0_ODT3	DDR0_DQ20	AM37	MDA20
			DDR0_DQ21	AM38	MDA16
	AW33	DDR0_ECC0	DDR0_DQ22	AP37	MDA22
	AV33	DDR0_ECC1	DDR0_DQ23	AP40	MDA23
	AU31	DDR0_ECC2	DDR0_DQ24	AV37	MDA25
	AV31	DDR0_ECC3	DDR0_DQ25	AW37	MDA29
	AT33	DDR0_ECC4	DDR0_DQ26	AU35	MDA26
	AU33	DDR0_ECC5	DDR0_DQ27	AV35	MDA27
	AT31	DDR0_ECC6	DDR0_DQ28	AT37	MDA28
	AW31	DDR0_ECC7	DDR0_DQ29	AU37	MDA24
			DDR0_DQ30	AT35	MDA30
			DDR0_DQ31	AW35	MDA31
(7) SBAA0	SBAA0	AV12	DDR0_BA0	AY6	MDA33
(7) SBAA1	SBAA1	AY11	DDR0_BA1	AU6	MDA37
(7) SBAA2	SBAA2	AT21	DDR0_BA2	AV4	MDA34
(7) CKEA0	CKEA0	AV22	DDR0_CKE0	AU4	MDA35
(7) CKEA1	CKEA1	AT23	DDR0_CKE1	AW6	MDA36
		AU22	DDR0_CKE2	AV6	MDA32
		AU23	DDR0_CKE3	AW4	MDA38
				AY4	MDA39
				AR1	MDA41
				AR4	MDA45
(7) -CSA0	-CSA0	AU14	DDR0_CS_N0	AN3	MDA42
(7) -CSA1	-CSA1	AV9	DDR0_CS_N1	AN4	MDA43
		AU10	DDR0_CS_N2	AR2	MDA44
		AW8	DDR0_CS_N3	AR3	MDA40
				AN2	MDA46
(7) DCLKA0	DCLKA0	AY15	DDR0_CLK_P0	AN1	MDA47
(7) -DCLKA0	-DCLKA0	AY16	DDR0_CLK_N0	AL1	MDA49
(7) DCLKA1	DCLKA1	AW15	DDR0_CLK_P1	AL4	MDA53
(7) -DCLKA1	-DCLKA1	AV15	DDR0_CLK_N1	AJ3	MDA50
		AY14	DDR0_CLK_P2	AJ4	MDA51
		AW14	DDR0_CLK_N2	AL2	MDA52
		AW13	DDR0_CLK_P3	AL3	MDA48
		AY13	DDR0_CLK_N3	AJ2	MDA54
				AJ1	MDA55
	AW12	RSVD		AG1	MDA57
				AG4	MDA61
				AE3	MDA58
				AE4	MDA59
				AG2	MDA60
				AG3	MDA56
				AE2	MDA62
				AE1	MDA63
				AE39	DQSA0
				AJ39	DQSA1
				AN39	DQSA2
				AV36	DQSA3
				AV5	DQSA4
				AP3	DQSA5
				AK3	DQSA6
				AE3	DQSA7
(7) -SRASA	-SRASA	AU12	DDR0_RAS*	AV32	
(7) -SWEA	-SWEA	AU11	DDR0_WE*	AE38	-DQSA0
		AV20	RSVD	AJ38	-DQSA1
		AW27	RSVD	AN38	-DQSA2
(7) -SCASA	-SCASA	AU9	DDR0_CAS*	AU36	-DQSA3
				AW5	-DQSA4
				AP2	-DQSA5
				AK2	-DQSA6
				AF2	-DQSA7
(7,8) -DDR3_RST	WR61 0/4/SHT/M/X	AK22	DDR_RESET*	AU32	

WC4 0.1u/4/X7R/16V/K/X

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

LGA1150 (B)

LGA1150B

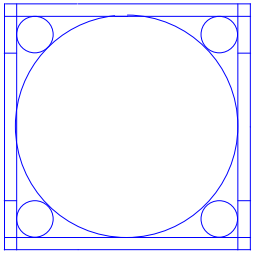
MAAB0	AL19	DDR1_MA0	DDR1_DQ0	AE34	MDB0
MAAB1	AK23	DDR1_MA1	DDR1_DQ1	AE35	MDB1
MAAB2	AM22	DDR1_MA2	DDR1_DQ2	AG35	MDB2
MAAB3	AM23	DDR1_MA3	DDR1_DQ3	AH35	MDB3
MAAB4	AP23	DDR1_MA4	DDR1_DQ4	AD34	MDB4
MAAB5	AL23	DDR1_MA5	DDR1_DQ5	AD35	MDB5
MAAB6	AY24	DDR1_MA6	DDR1_DQ6	AG34	MDB6
MAAB7	AV25	DDR1_MA7	DDR1_DQ7	AH34	MDB7
MAAB8	AU26	DDR1_MA8	DDR1_DQ8	AL34	MDB8
MAAB9	AW25	DDR1_MA9	DDR1_DQ9	AL35	MDB9
MAAB10	AP18	DDR1_MA10	DDR1_DQ10	AK31	MDB10
MAAB11	AY25	DDR1_MA11	DDR1_DQ11	AL31	MDB11
MAAB12	AV26	DDR1_MA12	DDR1_DQ12	AK34	MDB12
MAAB13	AR15	DDR1_MA13	DDR1_DQ13	AK35	MDB13
MAAB14	AV27	DDR1_MA14	DDR1_DQ14	AK32	MDB14
MAAB15	AY28	DDR1_MA15	DDR1_DQ15	AL32	MDB15
			DDR1_DQ16	AN34	MDB17
MODT_B0	AM17	DDR1_ODT0	DDR1_DQ17	AP34	MDB21
MODT_B1	AL16	DDR1_ODT1	DDR1_DQ18	AN31	MDB19
	AM16	DDR1_ODT2	DDR1_DQ19	AP31	MDB23
	AK15	DDR1_ODT3	DDR1_DQ20	AN35	MDB20
			DDR1_DQ21	AP35	MDB16
	AM26	DDR1_ECC0	DDR1_DQ22	AN32	MDB18
	AM25	DDR1_ECC1	DDR1_DQ23	AP32	MDB22
	AP25	DDR1_ECC2	DDR1_DQ24	AM29	MDB25
	AP26	DDR1_ECC3	DDR1_DQ25	AM28	MDB28
	AL26	DDR1_ECC4	DDR1_DQ26	AR29	MDB27
	AL25	DDR1_ECC5	DDR1_DQ27	AR28	MDB30
	AR26	DDR1_ECC6	DDR1_DQ28	AL29	MDB24
	AR25	DDR1_ECC7	DDR1_DQ29	AL28	MDB29
			DDR1_DQ30	AP29	MDB26
			DDR1_DQ31	AP28	MDB31
(8) SBAB0	SBAB0	AK17	DDR1_BA0	AR12	MDB32
(8) SBAB1	SBAB1	AL18	DDR1_BA1	DDR1_DQ32	MDB33
(8) SBAB2	SBAB2	AW28	DDR1_BA2	DDR1_DQ33	AL13
				DDR1_DQ34	MDB34
(8) CKEB0	CKEB0	AW29	DDR1_CKE0	DDR1_DQ35	AL12
(8) CKEB1	CKEB1	AY29	DDR1_CKE1	DDR1_DQ36	MDB35
		AU28	DDR1_CKE2	DDR1_DQ37	AR13
		AU29	DDR1_CKE3	DDR1_DQ38	MDB36
				DDR1_DQ39	AP13
(8) -CSB0	-CSB0	AP17	DDR1_CS_N0	DDR1_DQ40	AM13
(8) -CSB1	-CSB1	AN15	DDR1_CS_N1	DDR1_DQ41	MDB37
		AN17	DDR1_CS_N2	DDR1_DQ42	AM12
		AL15	DDR1_CS_N3	DDR1_DQ43	MDB38
				DDR1_DQ44	MDB39
				DDR1_DQ45	AR9
(8) DCLKB0	DCLKB0	AM20	DDR1_CLK_P0	DDR1_DQ46	MDB45
(8) -DCLKB0	-DCLKB0	AM21	DDR1_CLK_N0	DDR1_DQ47	AP9
(8) DCLKB1	DCLKB1	AP22	DDR1_CLK_P1	DDR1_DQ48	MDB41
(8) -DCLKB1	-DCLKB1	AP21	DDR1_CLK_N1	DDR1_DQ49	AR6
		AN20	DDR1_CLK_P2	DDR1_DQ50	MDB47
		AN21	DDR1_CLK_N2	DDR1_DQ51	AP6
		AP19	DDR1_CLK_P3	DDR1_DQ52	MDB43
		AP20	DDR1_CLK_N3	DDR1_DQ53	AR10
				DDR1_DQ54	MDB44
(8) -SCASB	-SCASB	AP16	DDR1_CAS*	DDR1_DQ55	AP10
		AL20	RSVD	DDR1_DQ56	MDB40
(8) -SRASB	-SRASB	AM18	DDR1_RAS*	DDR1_DQ57	AR7
(8) -SWEB	-SWEB	AK16	DDR1_WE*	DDR1_DQ58	MDB46
				DDR1_DQ59	AP7
				DDR1_DQ60	MDB42
(7) VREF_DQA	VREF_DQA	AB39	DDR_VREF_DQ0	DDR1_DQ61	AM9
(8) VREF_DQB	VREF_DQB	AB40	DDR_VREF_DQ1	DDR1_DQ62	MDB52
				DDR1_DQ63	AL9
				DDR1_DQS_P0	AE35
				DDR1_DQS_P1	AL33
				DDR1_DQS_P2	AP33
				DDR1_DQS_P3	AN28
				DDR1_DQS_P4	AN12
				DDR1_DQS_P5	AP8
				DDR1_DQS_P6	AL8
				DDR1_DQS_P7	AG7
				DDR1_DQS_P8	AN25
				DDR1_DQS_N0	AF34
				DDR1_DQS_N1	AK33
				DDR1_DQS_N2	AN33
				DDR1_DQS_N3	AP29
				DDR1_DQS_N4	AN13
				DDR1_DQS_N5	AR8
				DDR1_DQS_N6	AM8
				DDR1_DQS_N7	AG6
				DDR1_DQS_N8	AN26

VREF_DQA
VREF_DQB
WBC34 0.1u/4/X7R/16V/K
WBC33 0.1u/4/X7R/16V/K
Place in CPU bottom side

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

LGA1150 (CR)

CR
CPU RETAINTION/X



LGA1150

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			
Size: Custom	Document Number: GA--H81M-H		Rev: 1.1
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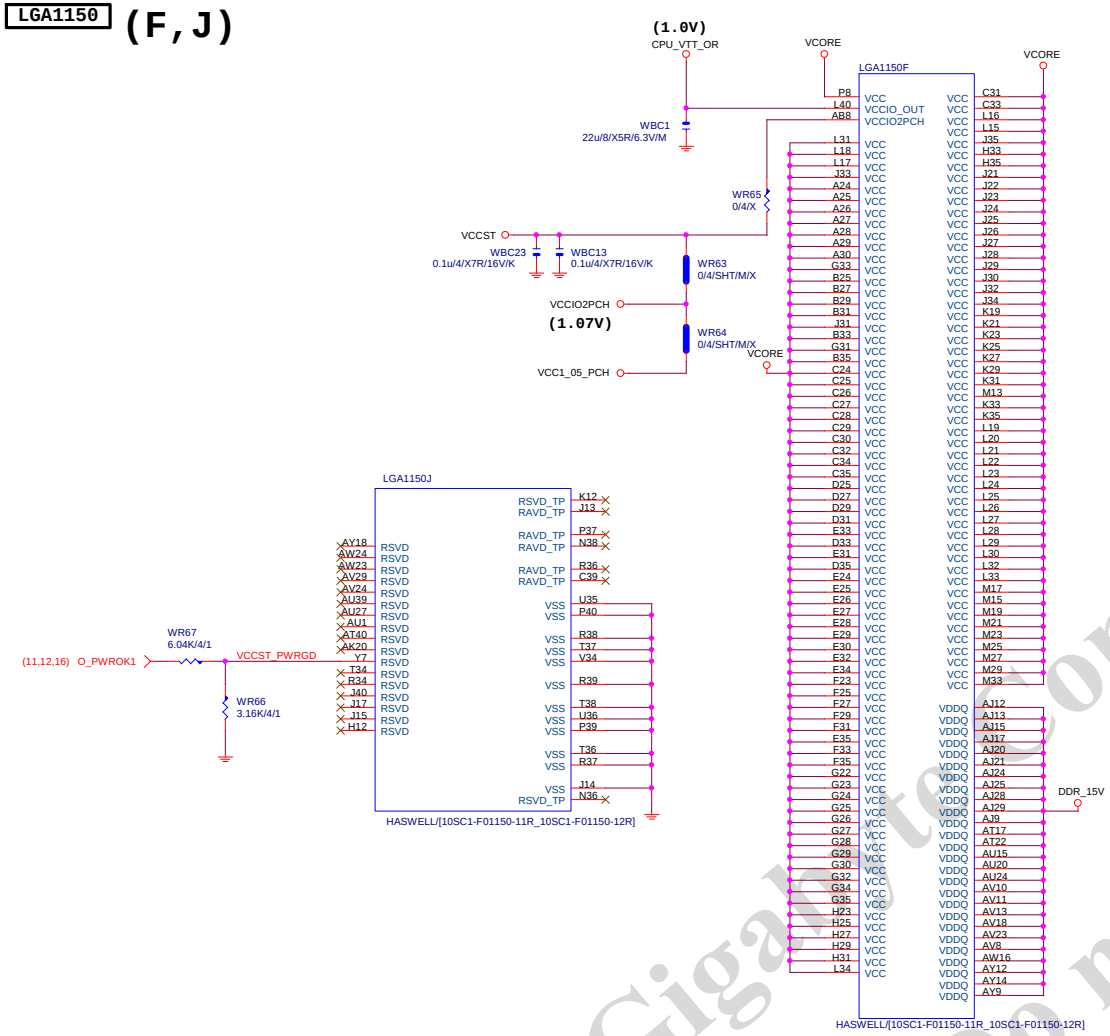
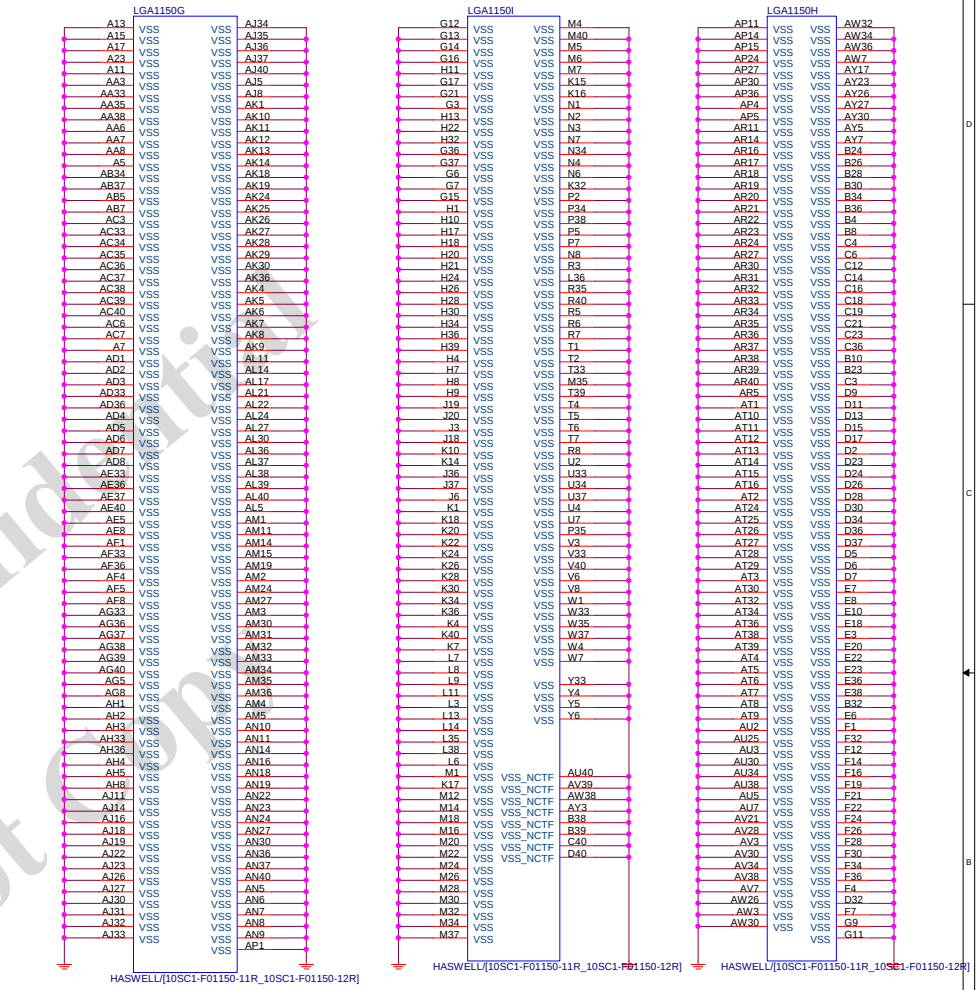
LGA1150 (F,J)

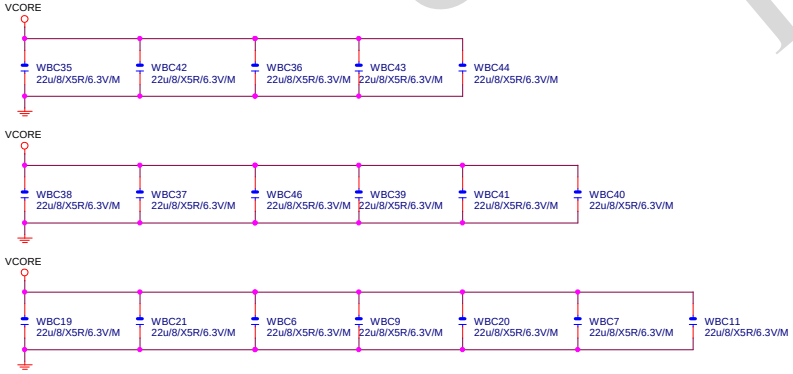


LGA1155 (G,H,I)



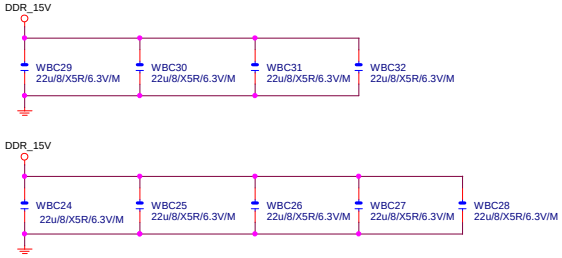
VCore CAP

(X18)

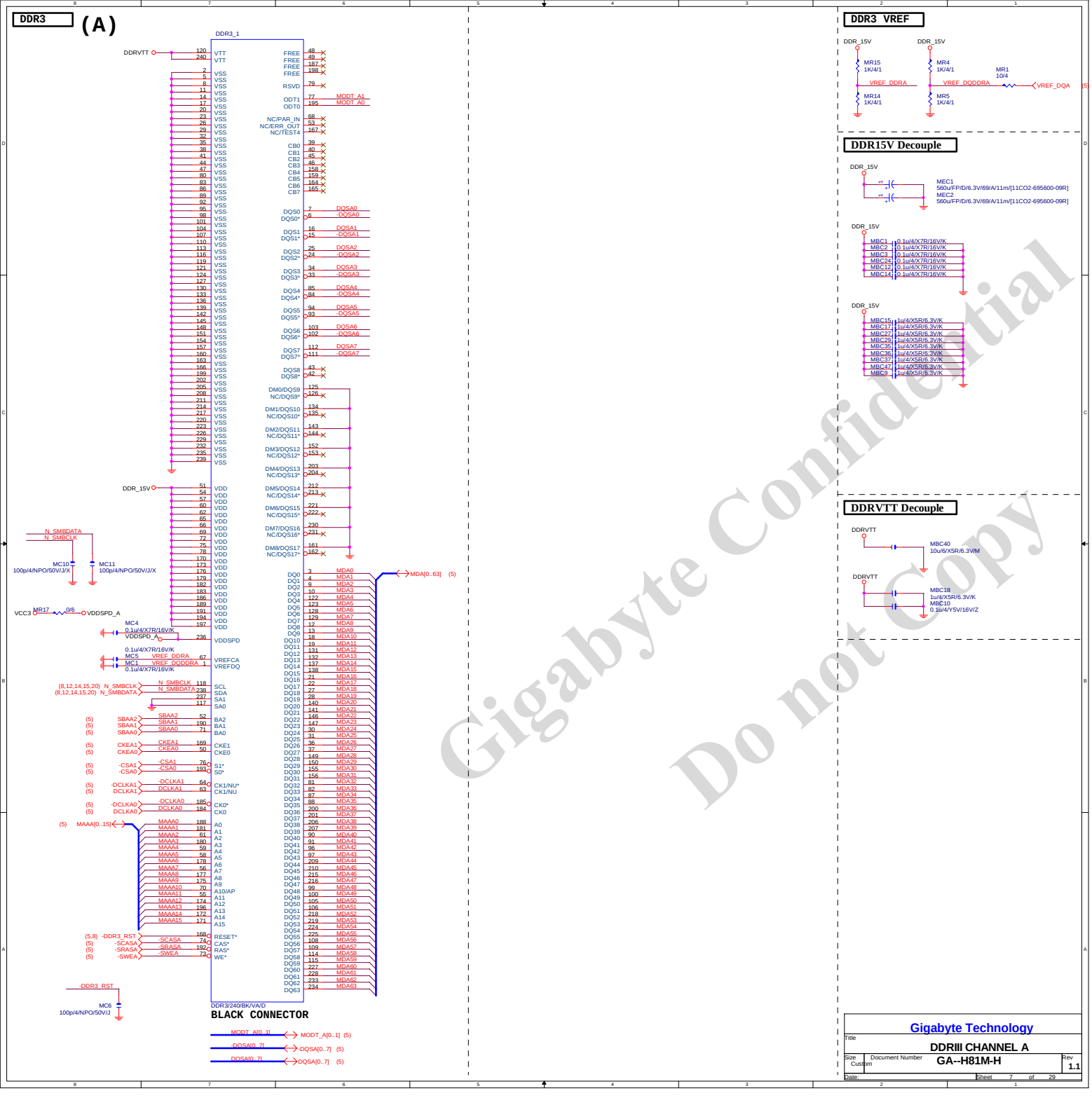


DDR CAP

(X9)



Gigabyte Technology		
Title: CPU LGA1150-C		
Size: Custom	Document Number: GA--H81M-H	Rev: 1.1
Date: Thursday, October 31, 2013	Sheet 6 of 29	

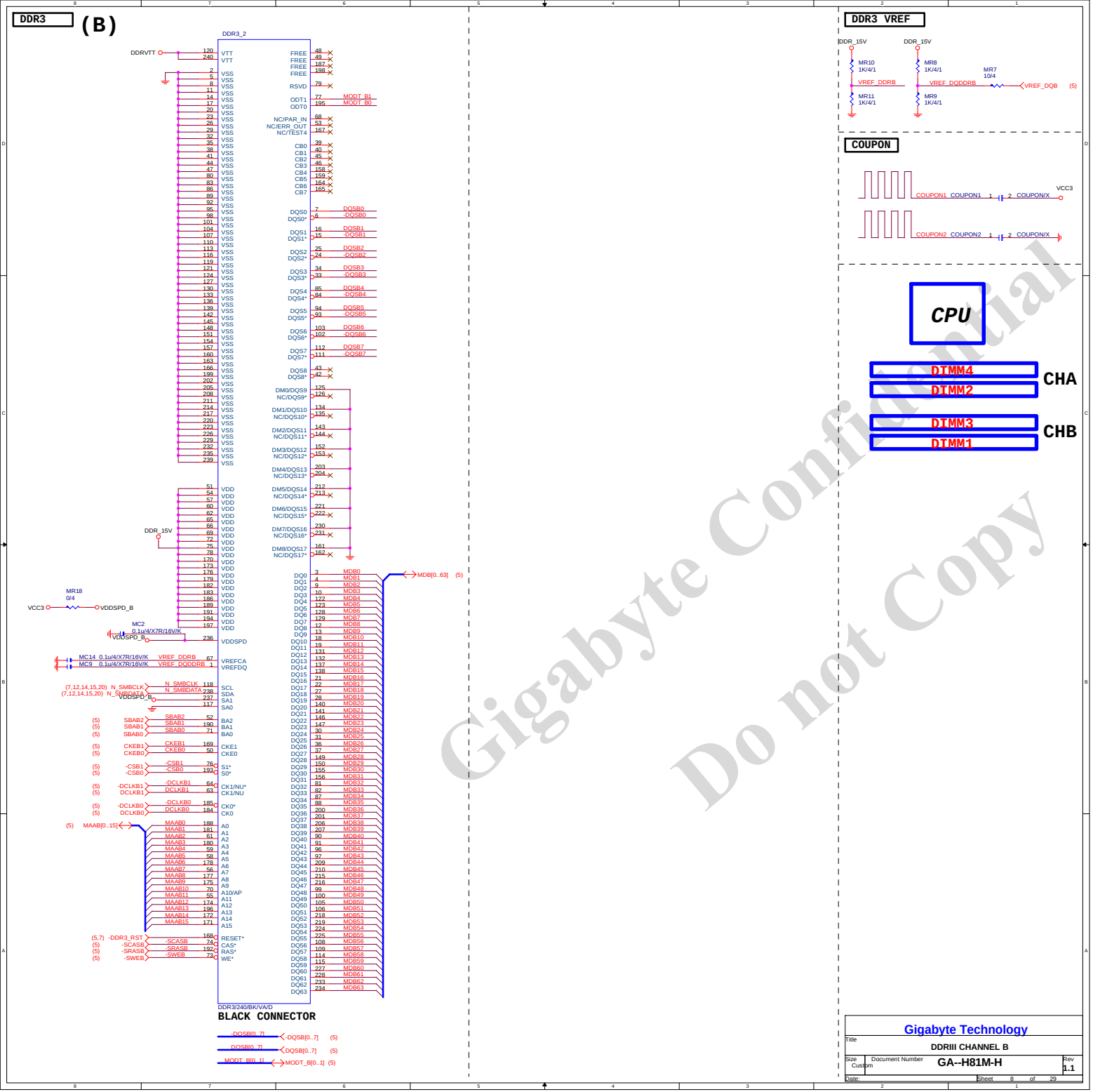


Gigabyte Technology

Title: DDRIII CHANNEL A

Size: Custom | Document Number: GA--H81M-H | Rev: 1.1

Date: | Sheet 7 of 29



Gigabyte Technology

Title: DDRIII CHANNEL B

Size: Custom | Document Number: GA--H81M-H | Rev: 1.1

Date: | Sheet 8 of 29

PCH (B)

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

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

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

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 A_DMI_0RXN A_DMI_0RXP A_DMI_1TXN A_DMI_1TXP A_DMI_1RXN A_DMI_1RXP A_DMI_2TXN A_DMI_2TXP A_DMI_2RXN A_DMI_2RXP A_DMI_3TXN A_DMI_3TXP 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 — NR40 7.5K/4/1

DMI_RCOMP
PCIE_RCOMP

CK_SRCCLK_PCH
CK_SRCCLK_PCH
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 N_+USBP0 N_-USBP1 N_+USBP1 N_-USBP2 N_+USBP2 N_-USBP3 N_+USBP3

N_-USBP0 (17) N_+USBP0 (17) N_-USBP1 (17) N_+USBP1 (17) N_-USBP2 (23) N_+USBP2 (23) N_-USBP3 (23) N_+USBP3 (23)

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

N_-USBP8 N_+USBP8 N_-USBP9 N_+USBP9 N_-USBP10 N_+USBP10 N_-USBP11 N_+USBP11

N_-USBP8 (20) N_+USBP8 (20) N_-USBP9 (20) N_+USBP9 (20) N_-USBP10 (20) N_+USBP10 (20) N_-USBP11 (20) N_+USBP11 (20)

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

PCIE Only

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

8111G

(23) LA_ML_IN (23) LA_ML_IP (23) LA_ML_ON (23) LA_ML_OP

F11 H11 B9 A9 J11 L11 B8 C8

PCIE

PCIEx1

(15) PI_PCIEX1_IN (15) PI_PCIEX1_IP (15) PI_PCIEX1_ON (15) PI_PCIEX1_OP (15) PJ_PCIEX1_IN (15) PJ_PCIEX1_IP (15) PJ_PCIEX1_ON (15) PJ_PCIEX1_OP

G9 F9 B7 A7 E7 H7 E1 D2

N/A

K6 K8 G3 G5 J2 J3 H2 H1

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_R (17)
N_GPIO14
N_-USBOC_F (17,20)
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

BD82B85/S/[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 FDILINK

(17) PCH_USB3_RXN0 (17) PCH_USB3_RXP0 (17) PCH_USB3_TXN0 (17) PCH_USB3_TXP0

F20 G20 B18 C18

USB3_RXN_0 USB3_RXP_0 USB3_TXN_0 USB3_TXP_0

FDI_RXN_0 FDI_RXP_0 FDI_RXN_1 FDI_RXP_1

N1 FDI_TXN0
N2 FDI_TXP0
P2 FDI_TXN1
P3 FDI_TXP1

(17) PCH_USB3_RXN1 (17) PCH_USB3_RXP1 (17) PCH_USB3_TXN1 (17) PCH_USB3_TXP1

G18 H18 B15 B16

USB3_RXN_1 USB3_RXP_1 USB3_TXN_1 USB3_TXP_1

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

N/A

K20 L20 D15 C15

USB3_RXN_4 USB3_RXP_4 USB3_TXN_4 USB3_TXP_4

L18 K18 B14 A14

USB3_RXN_5 USB3_RXP_5 USB3_TXN_5 USB3_TXP_5

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

TACH6_GP70
TACH7_GP71

BD82B85/S/[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

CK_DOTCLK — NR92 8.2K/4
CK_-DOTCLK — NR91 8.2K/4

NR225 short to GND in non graphic SKU

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

BD82B85/S/[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#	Not Use
OC3#	N/A
OC4#	F_USB1
OC5#	F_USB2
OC6#	Not Use
OC7#	N/A

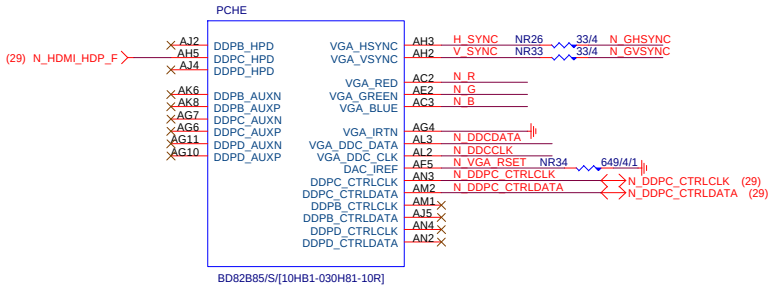
Gigabyte Technology

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

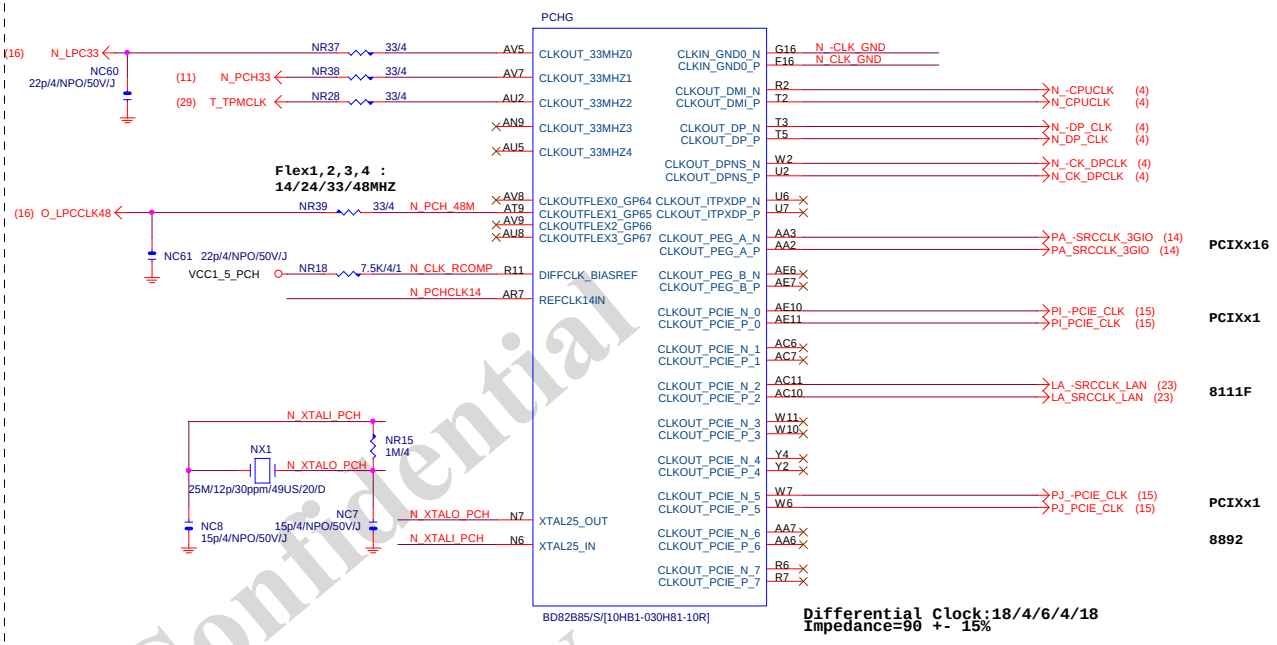
Size: Custom | Document Number: GA--H81M-H | Rev: 1.1

Date: Thursday, October 31, 2013 | Sheet 9 of 29

PCH (E)

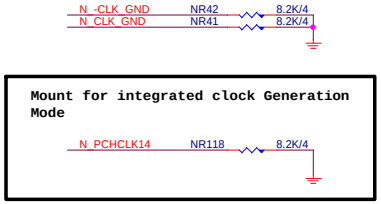


PCH (G)

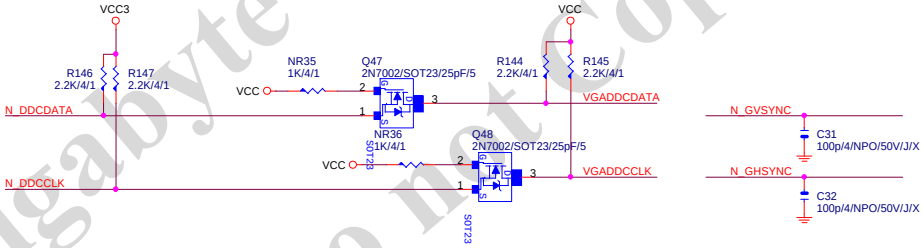


Differential Clock:18/4/6/4/18
Impedance=90 +- 15%

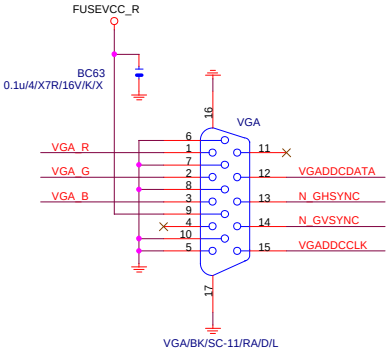
PCH CLK PD



VGA DDC

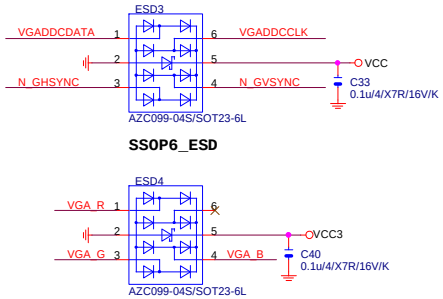


VGA CONNECTOR

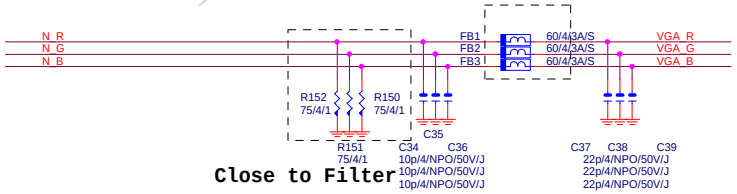


VGA/BK/SC-11/RA/D/L
BLACK CONNECTER

VGA ESD



VGA DDC

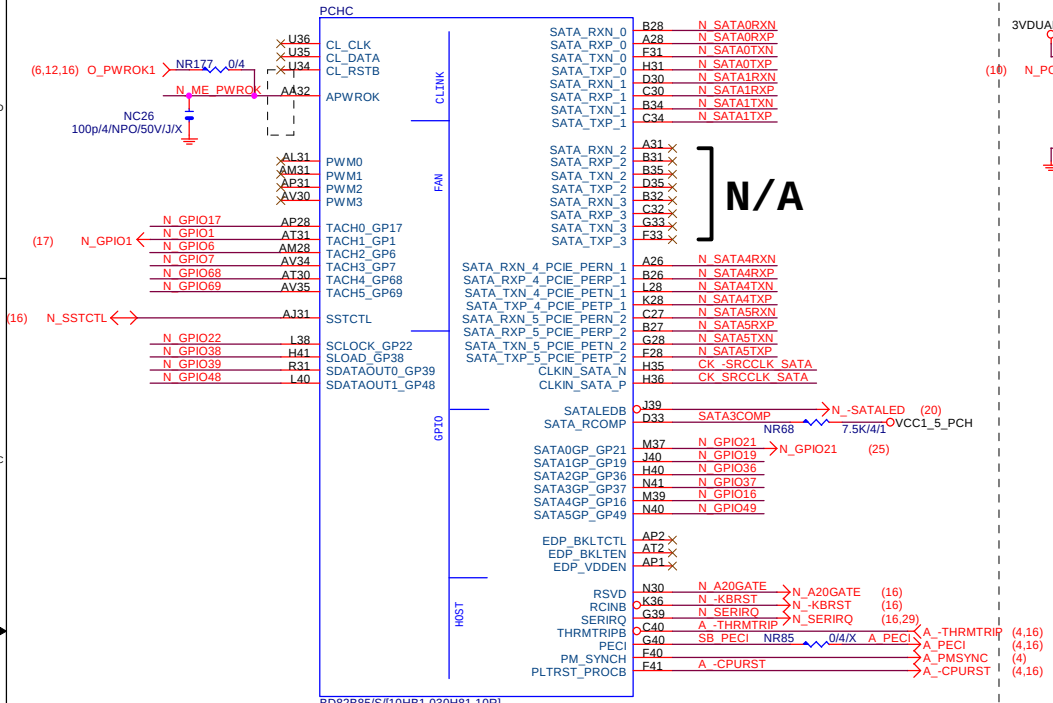


Close to Filter

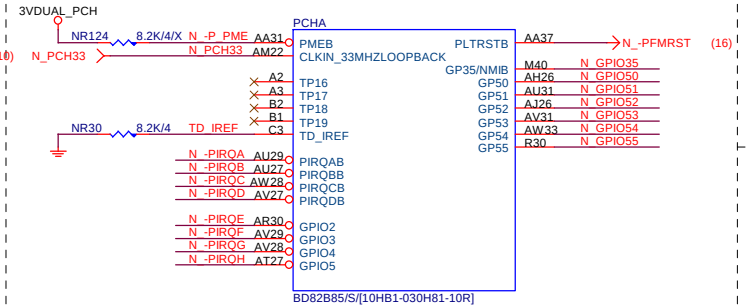
Gigabyte Technology		
Title: PCH DISPLAY ,CLK BUFFER		
Size: Custom	Document Number: GA--H81M-H	Rev: 1.1
Date: Thursday, October 31, 2013	Sheet 10 of 29	

PCH (C)

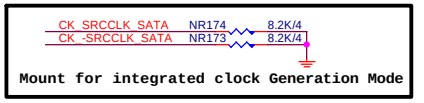
SATA3 : 20/7.5/4.5/7.5/20 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%
SATA2 : 15/7.5/4.5/7.5/15 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%



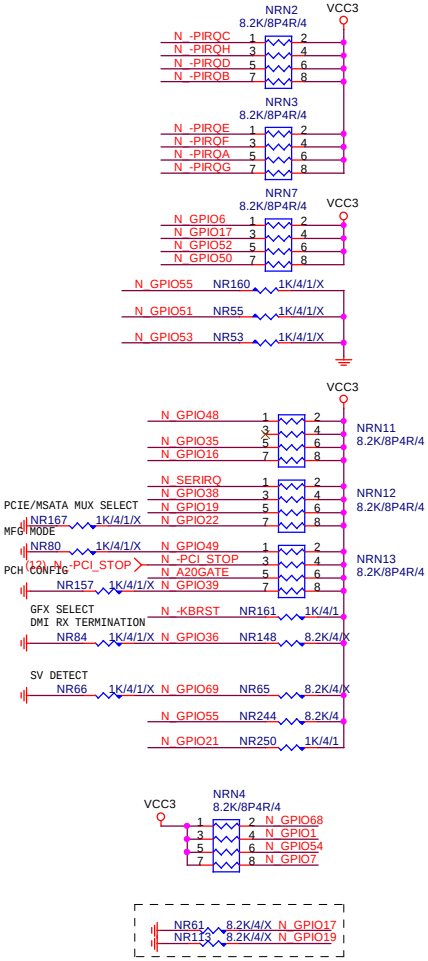
PCH (A)



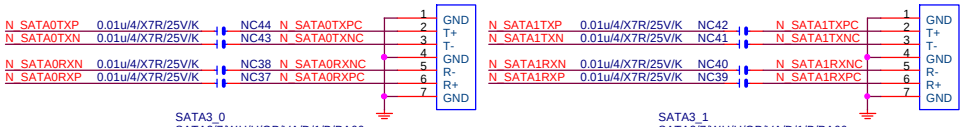
PCH CLK PD



PCH PU/PD



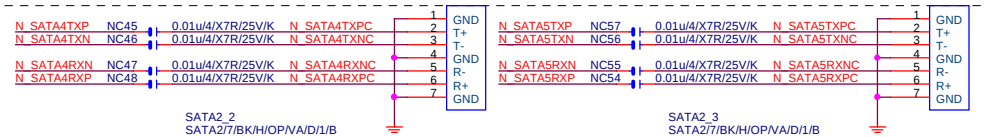
SATA CONNECTOR



WHITE CONNECTOR

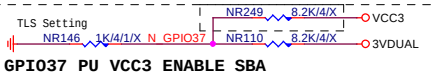
H81 Port 2/3 N/A

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

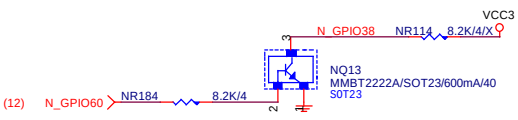


BLACK CONNECTOR

ME PWROK

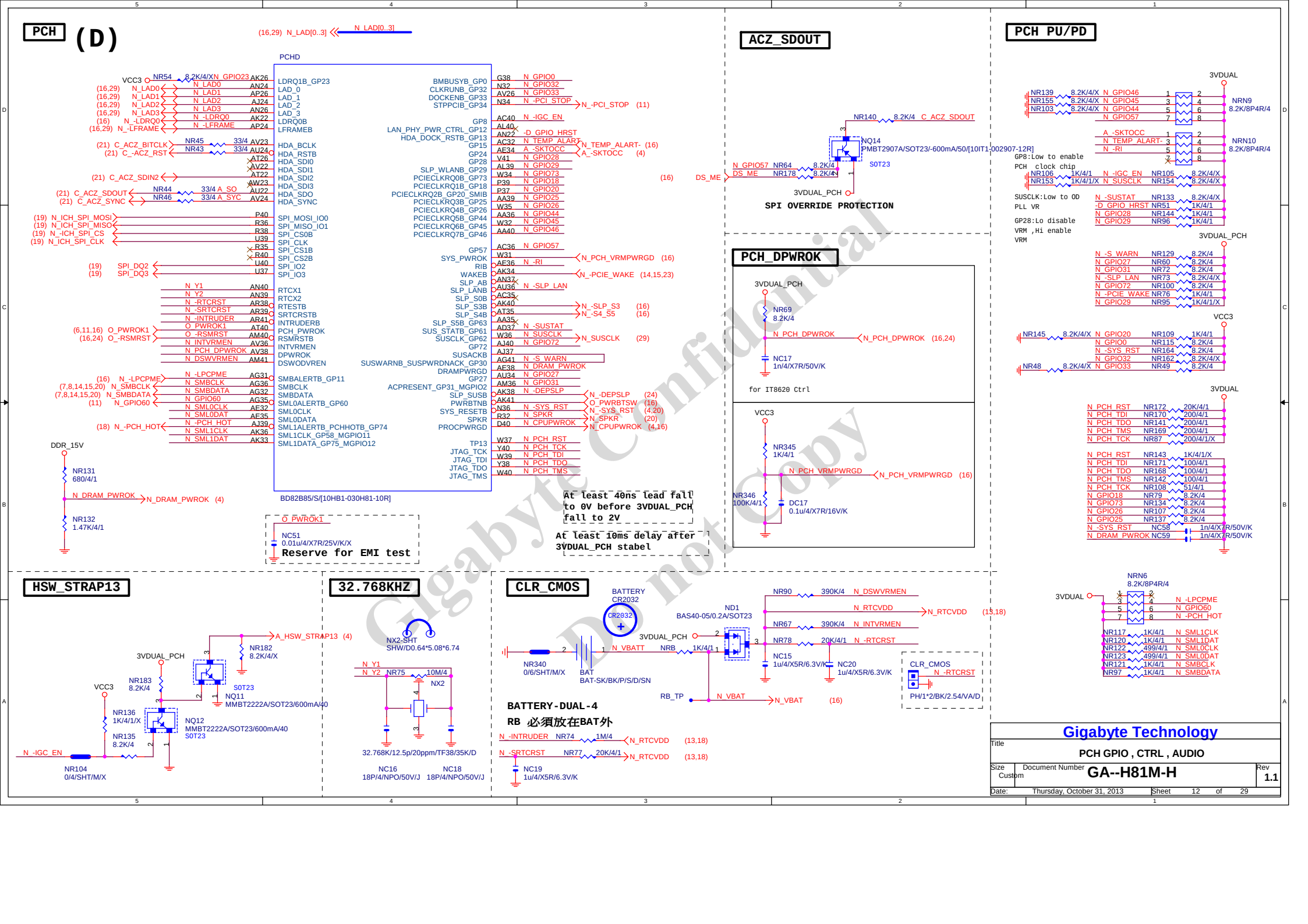


GPIO38 Ctrl

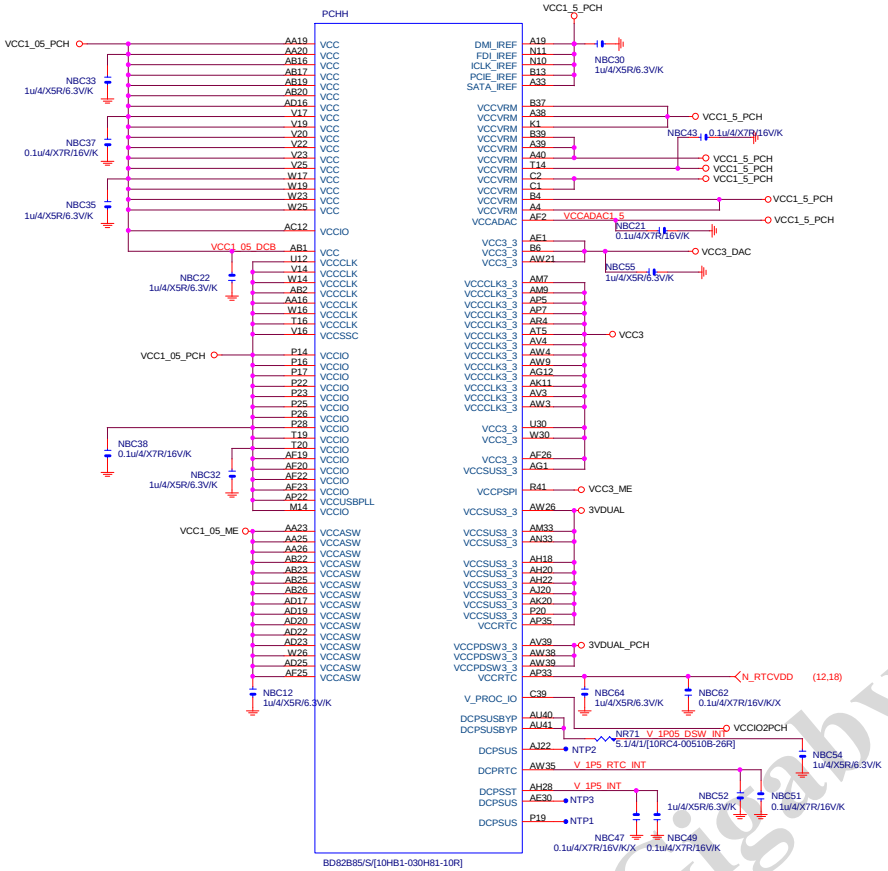


Gigabyte Technology

Title	PCH HOST , SATA, PCI	
Size: Custom	Document Number: GA--H81M-H	Rev: 1.1
Date: Thursday, October 31, 2013	Sheet 11 of 29	

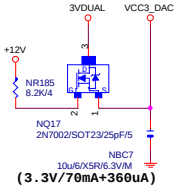

PCH (D)
PCHD
BD82B85/S/[10HB1-030H81-10R]
ACZ_SDOUT
SPI OVERRIDE PROTECTION
PCH_DPWROK
for IT8620 Ctrl
PCH PU/PD
HSW_STRAP13
32.768KHZ
CLR_CMOS
BATTERY-DUAL-4
RB 必須放在BAT外
Reserve for EMI test
At least 40ns lead fall to 0V before 3VDUAL_PCH fall to 2V
At least 10ms delay after 3VDUAL_PCH stabel
Gigabyte Technology
PCH GPIO , CTRL , AUDIO
GA--H81M-H
Rev 1.1
Thursday, October 31, 2013
Sheet 12 of 29
Gigabyte Confidential
Do not Copy

PCH (H)



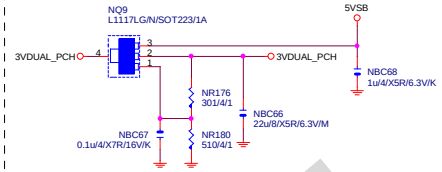
VCC3_DAC

CLOSE北橋(注意震盪水波紋)



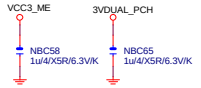
(3.3V/70mA+360uA)

3VDUAL_PCH

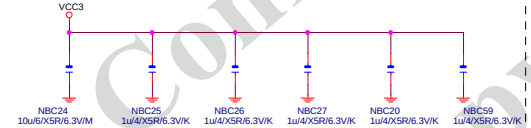


SHT PWR

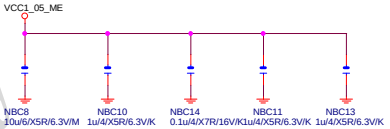
CAP



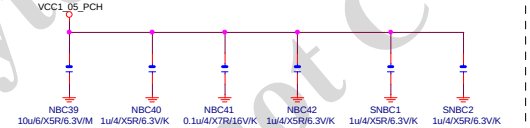
(3.3V)(X6)



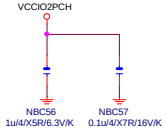
(1.05V)(X5)



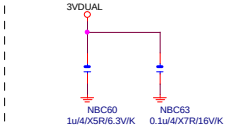
(1.05V)(X6)



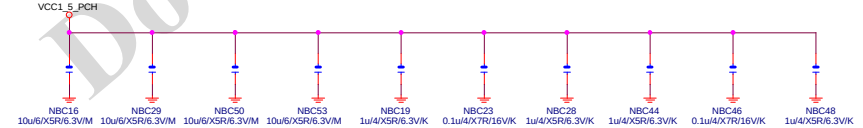
(1.05V)(X2)



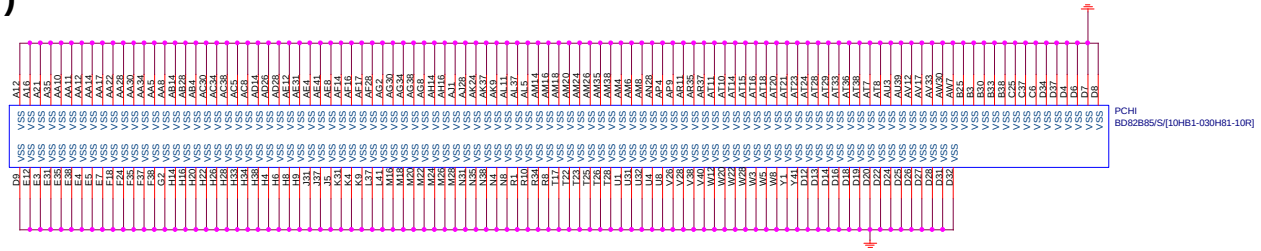
(3.3V)(X2)



(1.05V)(X10)



PCH (I)



Gigabyte Technology			
Title: PCH PWR ,GND			
Size: Custom	Document Number: GA--H81M-H		Rev: 1.1
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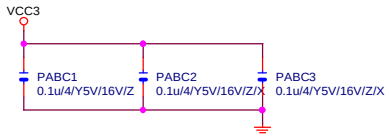
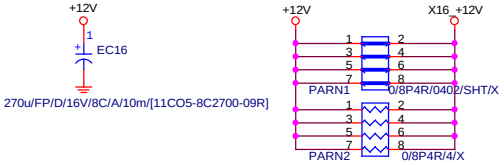
PCIEX16 CAP



PCIEX16 PROTECT SHT



PCIEX16 AC CAP

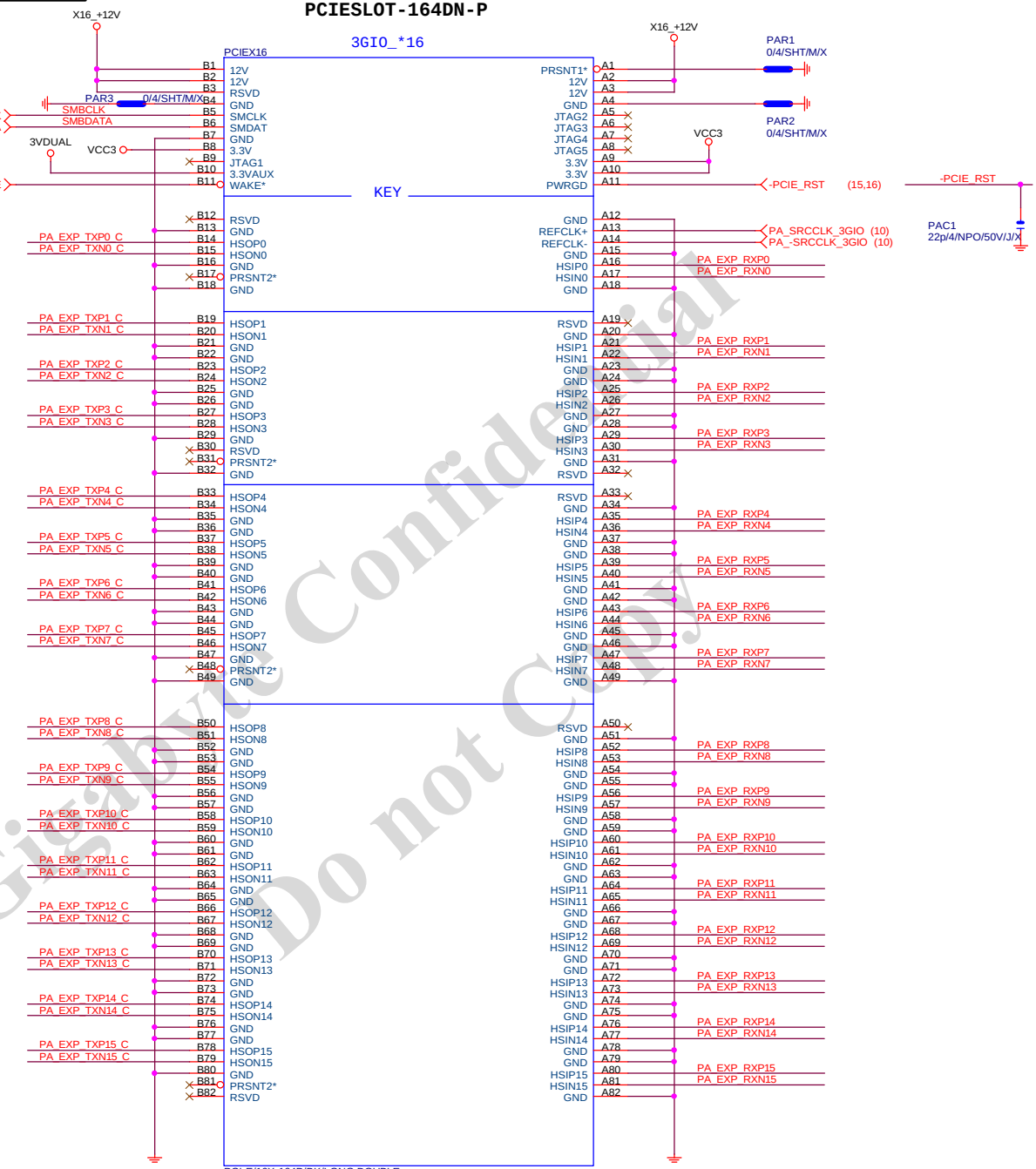
PA_EXP_TXP0	PAC5	0.22u/4/X5R/6.3V/K	PA_EXP_TXP0_C
PA_EXP_TXN0	PAC4	0.22u/4/X5R/6.3V/K	PA_EXP_TXN0_C
PA_EXP_TXP1	PAC6	0.22u/4/X5R/6.3V/K	PA_EXP_TXP1_C
PA_EXP_TXN1	PAC7	0.22u/4/X5R/6.3V/K	PA_EXP_TXN1_C
PA_EXP_TXP2	PAC8	0.22u/4/X5R/6.3V/K	PA_EXP_TXP2_C
PA_EXP_TXN2	PAC9	0.22u/4/X5R/6.3V/K	PA_EXP_TXN2_C
PA_EXP_TXP3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

3GIO_*16

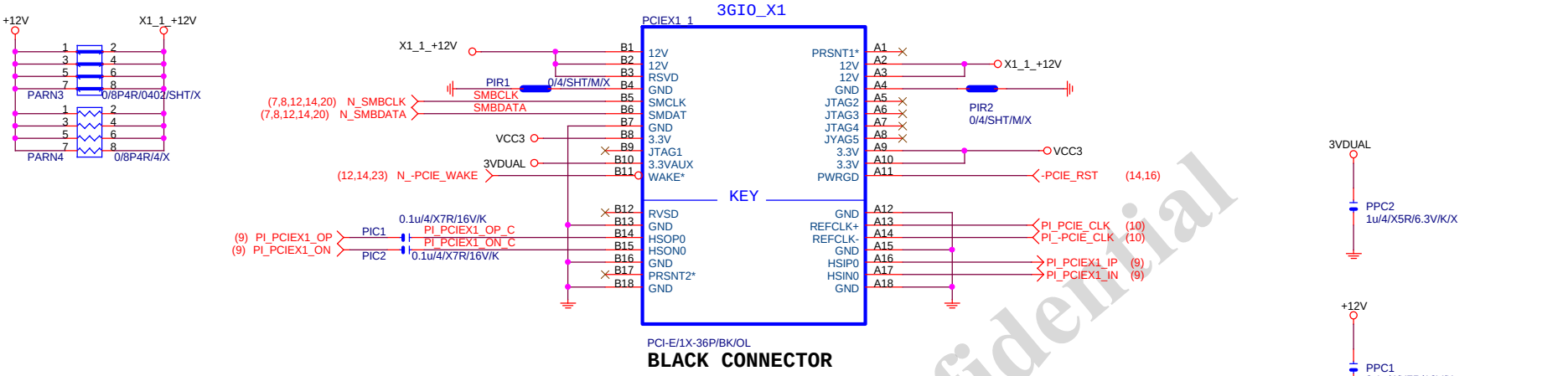


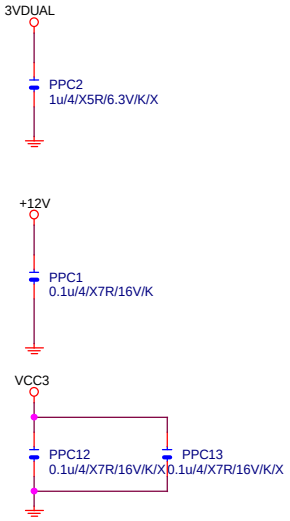
BLACK CONNECTOR

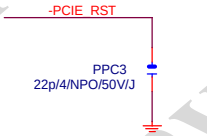
Title	Gigabyte Technology
	PCI EXPRESS * 16
Size: Custom	Document Number: GA--H81M-H
Rev	1.1
Date: Thursday, October 31, 2013	Sheet 14 of 29

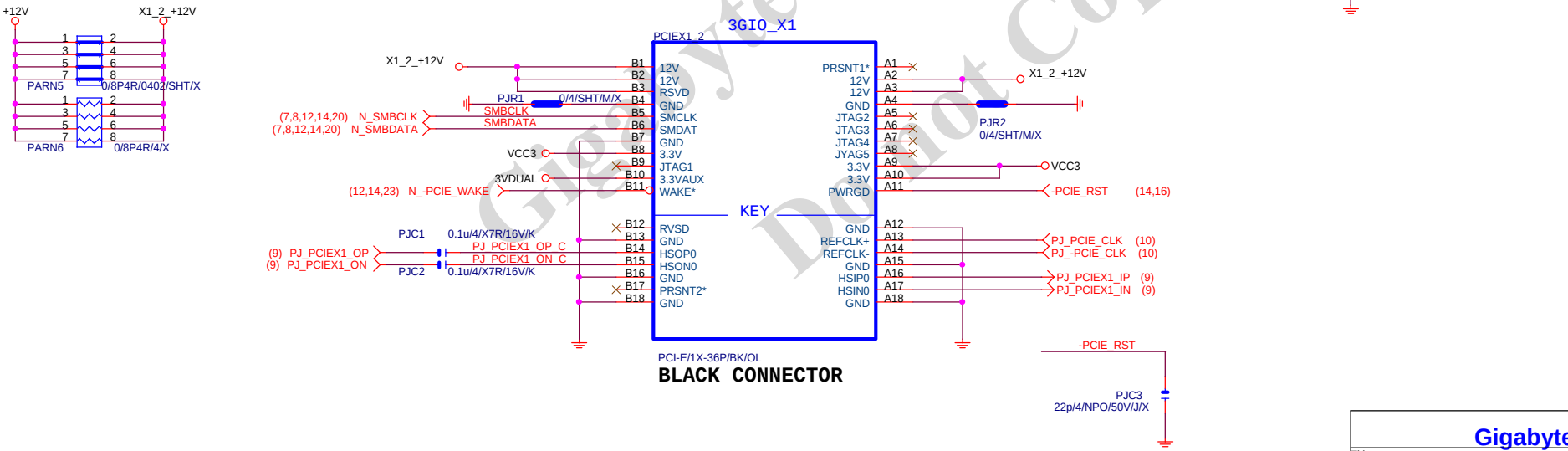
PCIEX1 SLOT

PCIEX1 PROTECT SHT



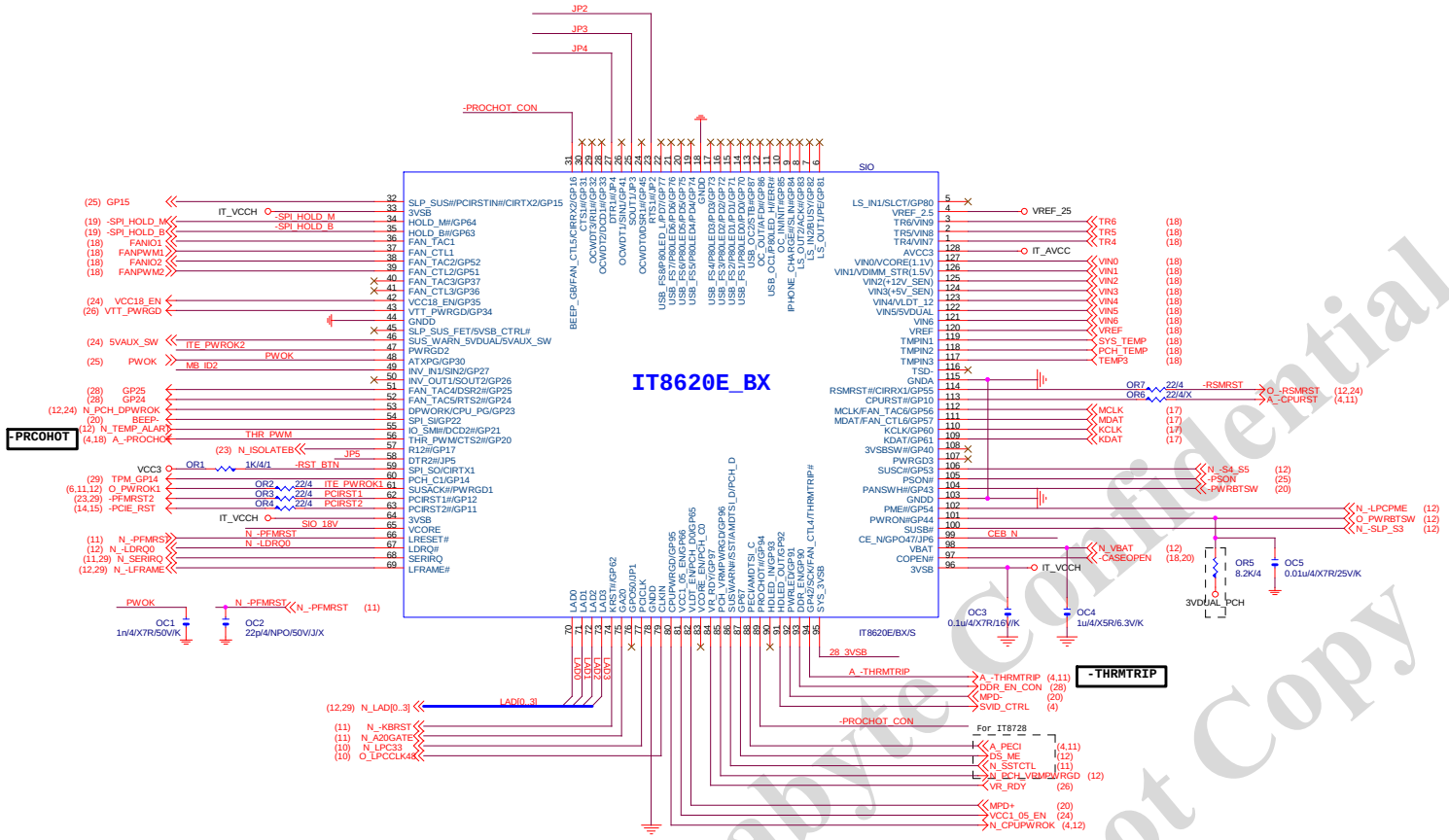




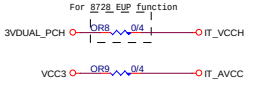


Gigabyte Technology		
Title: PCI EXPRESS X 1 PORT		
Size: Custom	Document Number: GA--H81M-H	Rev: 1.1
Date: Thursday, October 31, 2013	Sheet 15 of 29	

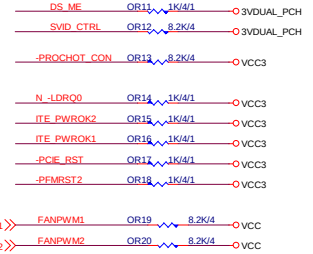
SIO IT8620



PWR SHT

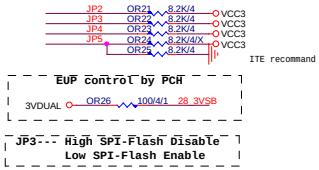


SIO PU

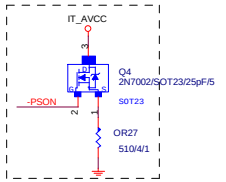


SIO STRAP

H61M-S2 1.1 JP6 stuff pull down



Power leakage



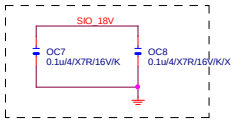
For IT8721 Power leakage

DUAL BIOS OPT STRAP

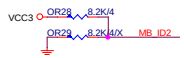
H81M-DS1 Single BIOS

SIO_18V

internal power pin, max 22nF cap



MB ID



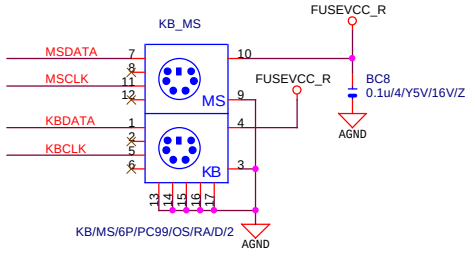
SIO CAP

Gigabyte Technology		
Title: PCH GPIO , CTRL , AUDIO		
Size: C	Document Number: GA--H81M-H	Rev: 1.1
Date: Thursday, October 31, 2013	Sheet 16 of 29	

COM

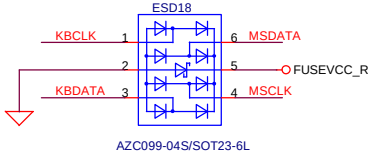
COM RI

KB/MS



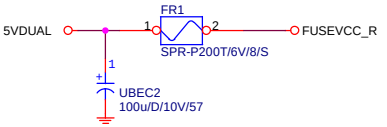
KB_MS ESD

H61M-DS2 R0.2

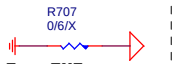


USB2.0 PWR

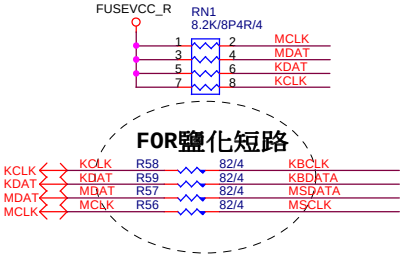
FUSE-0805

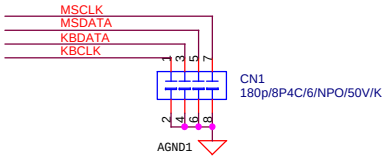


Close to connector

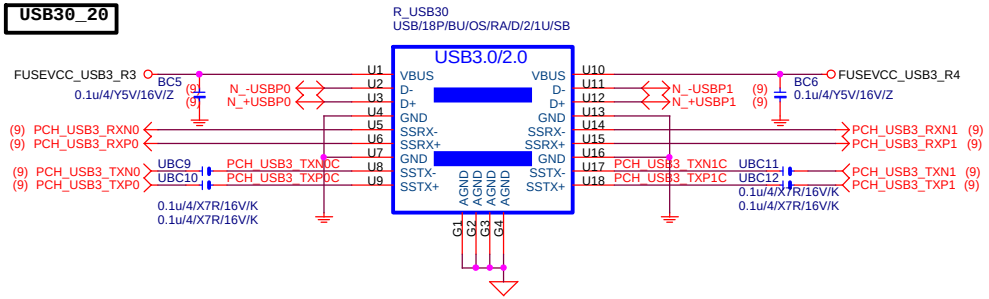


For EMI



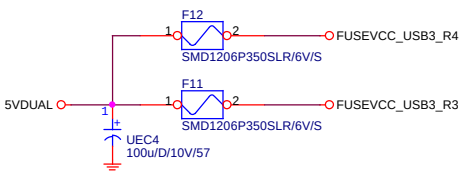


USB30_20



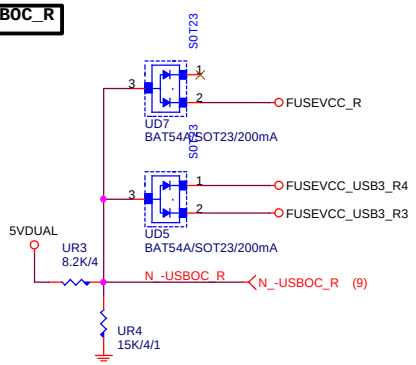
USB30_20 PWR

Polyswitch-1206



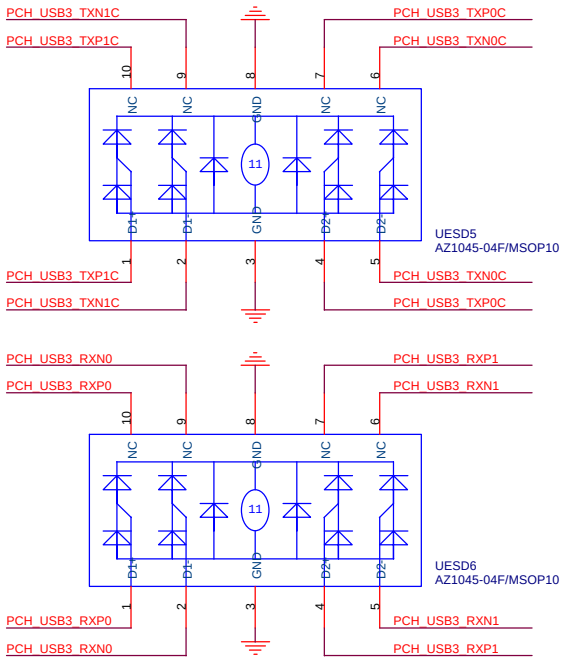
USB3.0 1Port - 1Fuse (3.5A)

-USBOC_R

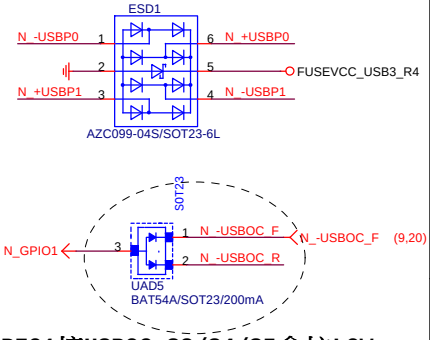


USB30_20 ESD PROCTECT

USB3.0 ESD



USB POWER PROTECT



N_GPIO1接USBOC,S3/S4/S5會拉LOW

Gigabyte Technology		
Title: COM,-RI,KB_USB,USB_ESATA,-PROCHOT		
Size: Custom	Document Number: GA--H81M-H	Rev: 1.1
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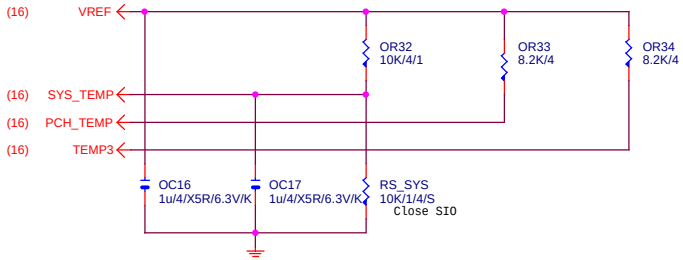
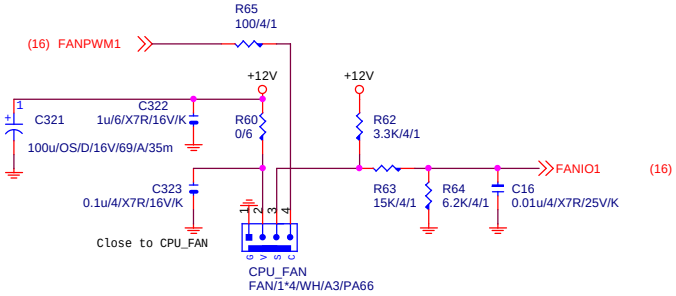
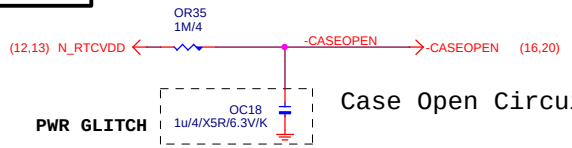
TEMP H/W MONITOR



CPU SMART FAN

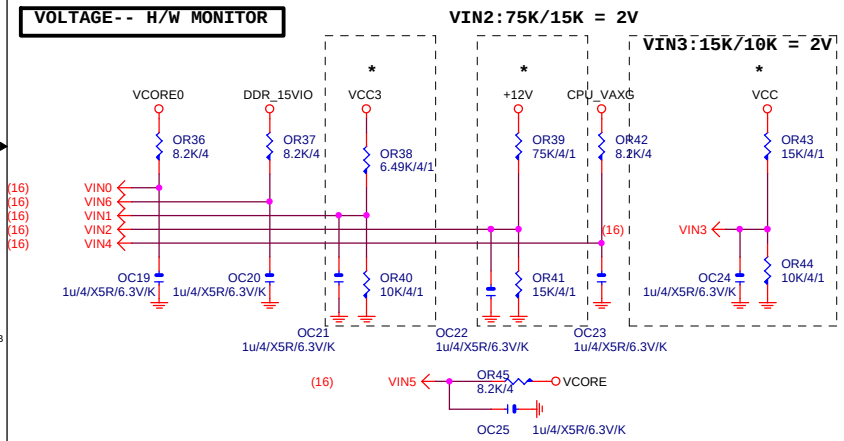


CASE OPEN



Case Open Circuits

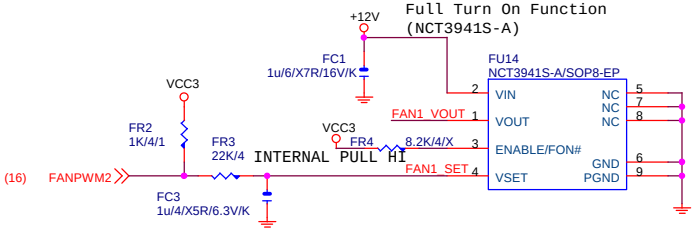
VOLTAGE-- H/W MONITOR

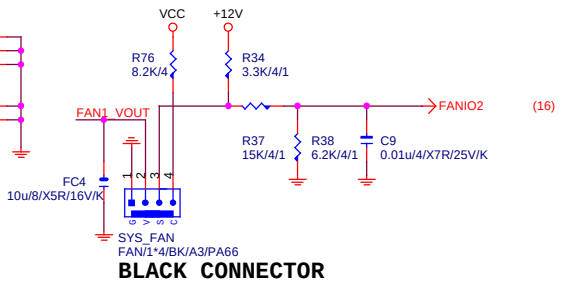


SYS SMART FAN

Linear SYS_FAN

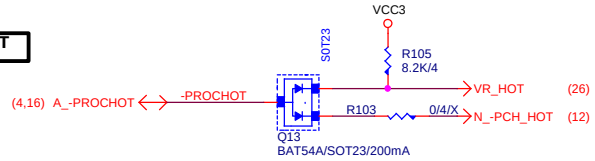
Enable Function (NCT3941S)
Full Turn On Function
(NCT3941S-A)

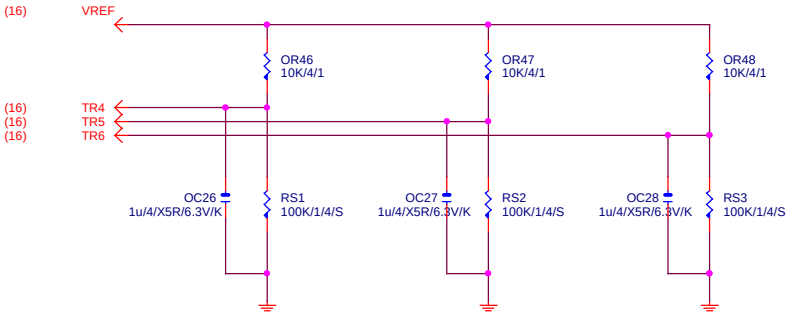




BLACK CONNECTOR

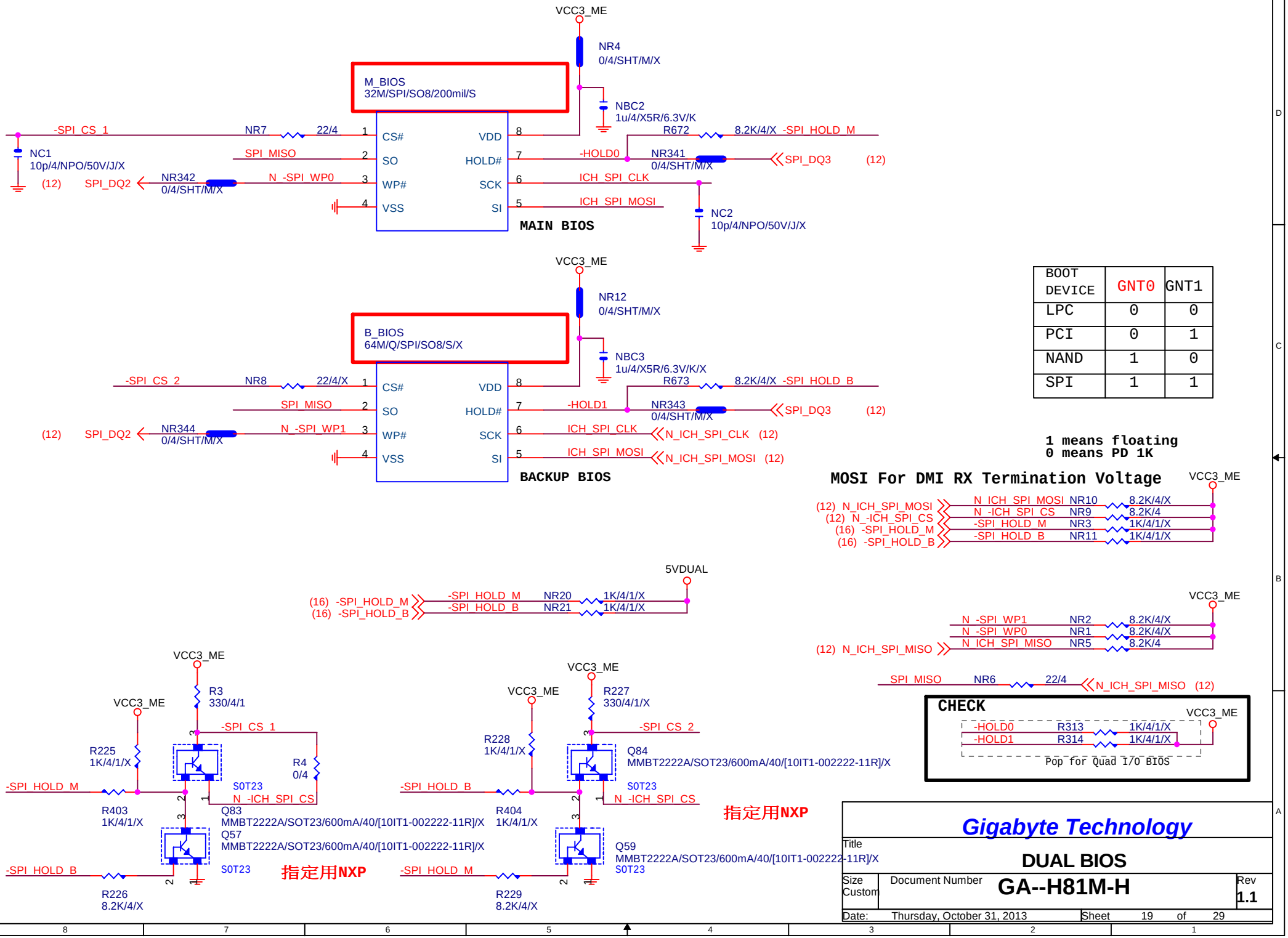
-PROHOT





RS1、RS2、RS3 CLOSE CPU
VR MOSFET

Gigabyte Technology		
Title: HWM,FAN CTRL,OV		
Size: Custom	Document Number: GA--H81M-H	Rev: 1.1
Date: Thursday, October 31, 2013	Sheet 18 of 29	



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

1 means floating
0 means PD 1K

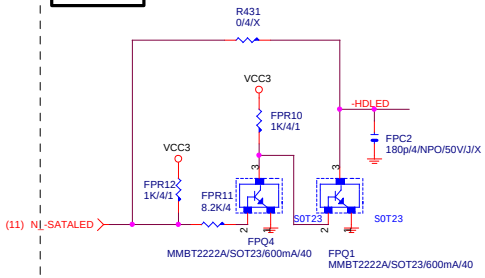
Gigabyte Technology

Title: DUAL BIOS

Size: Custom | Document Number: GA--H81M-H | Rev: 1.1

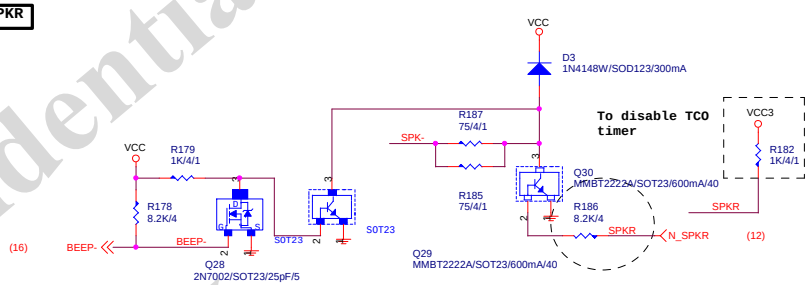
Date: Thursday, October 31, 2013 | Sheet 19 of 29

SATA LED

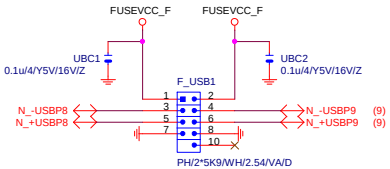


-USBOC_F

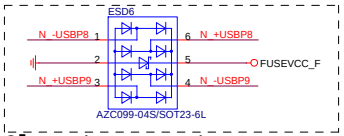
SPKR



FRONT USB1

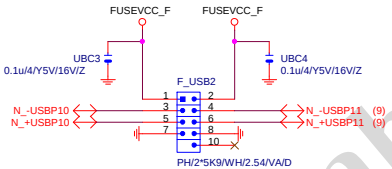


WHITE CONNECTOR

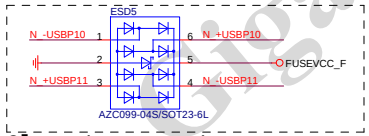


Close to connector

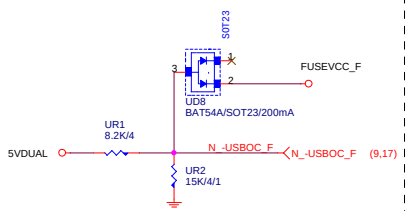
FRONT USB2



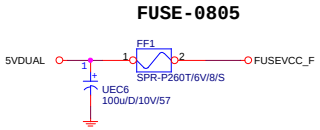
WHITE CONNECTOR



Close to connector

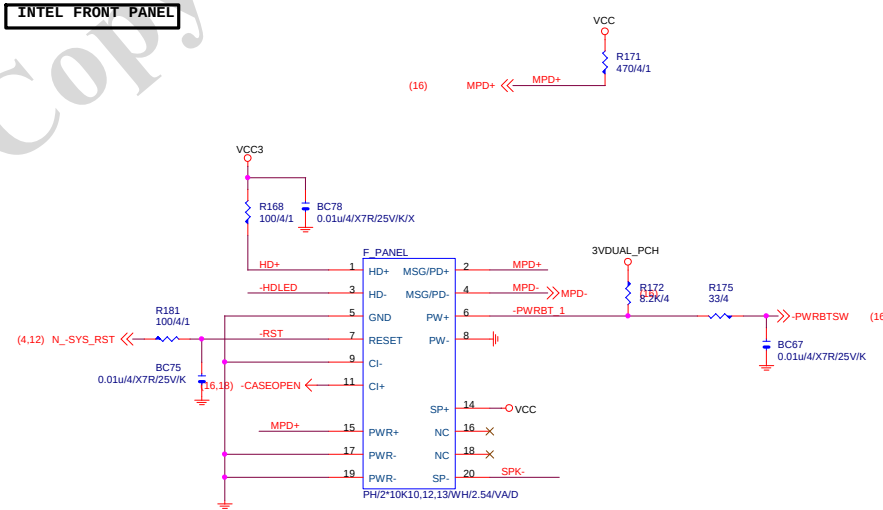


FUSE-0805

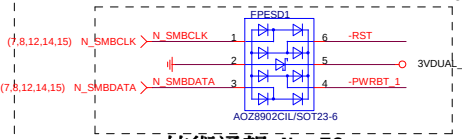


F_USB1, F_USB2 4-Port 2.6A

INTEL FRONT PANEL



PIN2X10PANEL_NEW



技術通報 No.79

Gigabyte Technology			
Title: FP,F_USB,USB PWR,SPKR,SATA LED			
Size: Custom	Document Number: GA--H81M-H		Rev: 1.1
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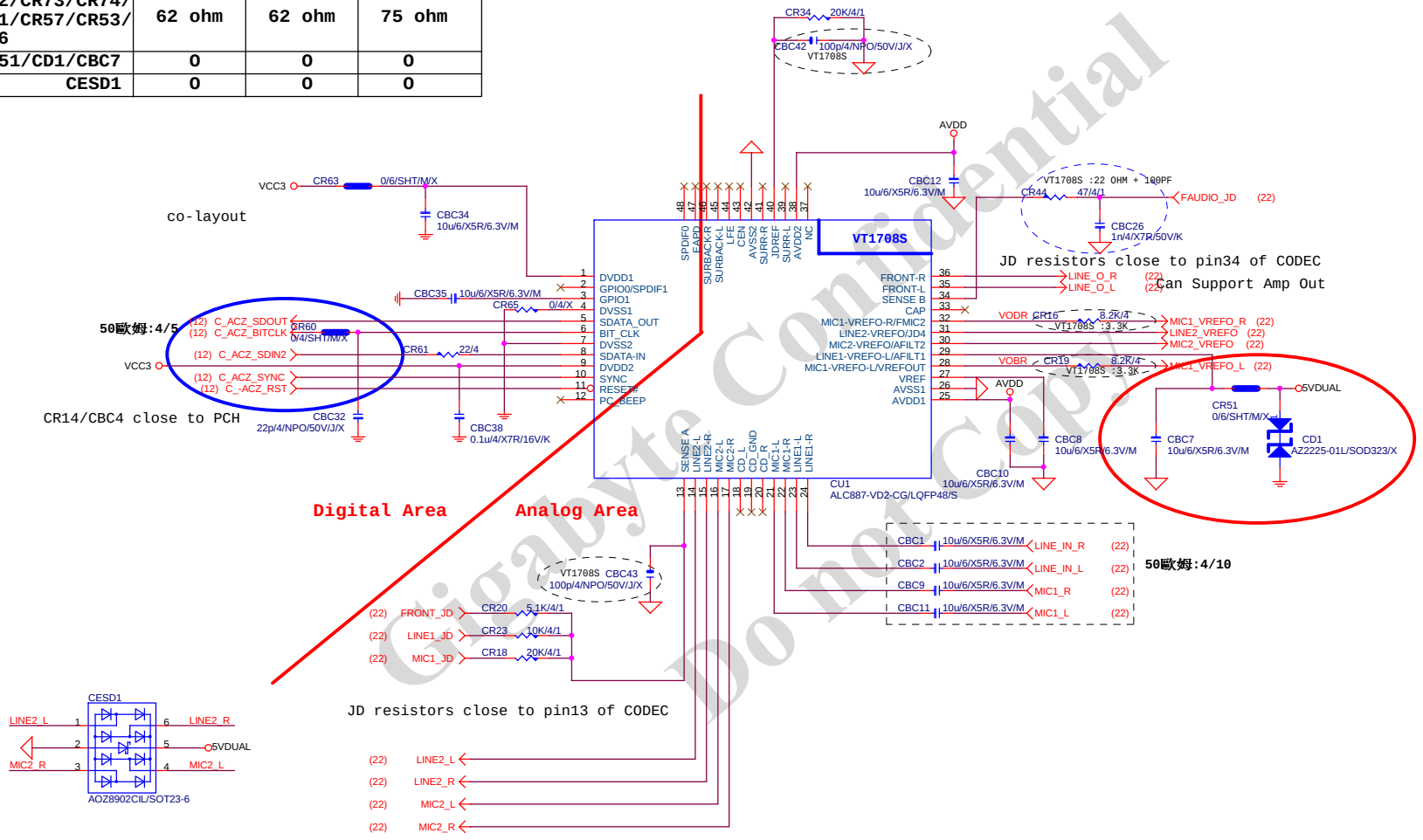
AZALIA CODEC *ALC892/ALC887-VD2/VT1708-CE Colay*

	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	0	0	0
CESD1	0	0	0



Gigabyte Technology

Title: HD AUDIO ALC887B-VD2/VT1708S/VT2021

Size: Custom | Document Number: GA--H81M-H | Rev: 1.1

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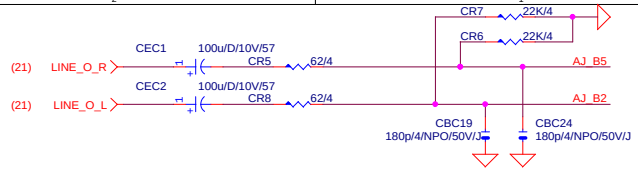
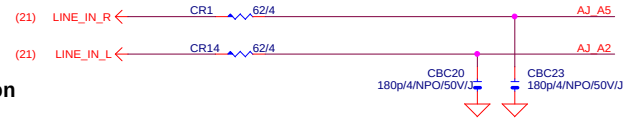
CR49 0/6/SHT/M/X
CR50 0/6/X
CR21 2.2/6
CR24 0/4/SHT/M/X

LINE-OUT



Only reserved for ALC888

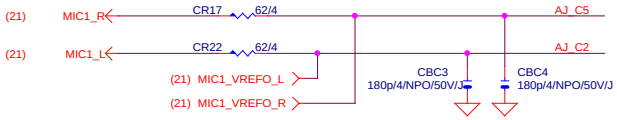
LINE-IN



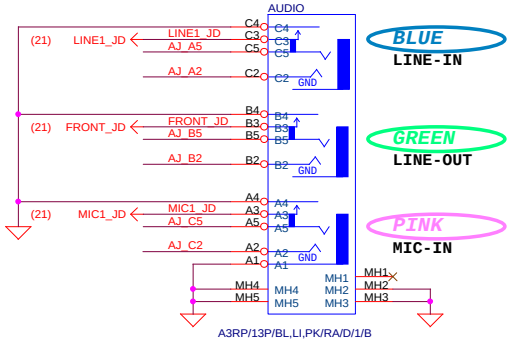
Verify MIC function in LINE-in

For 889A/888

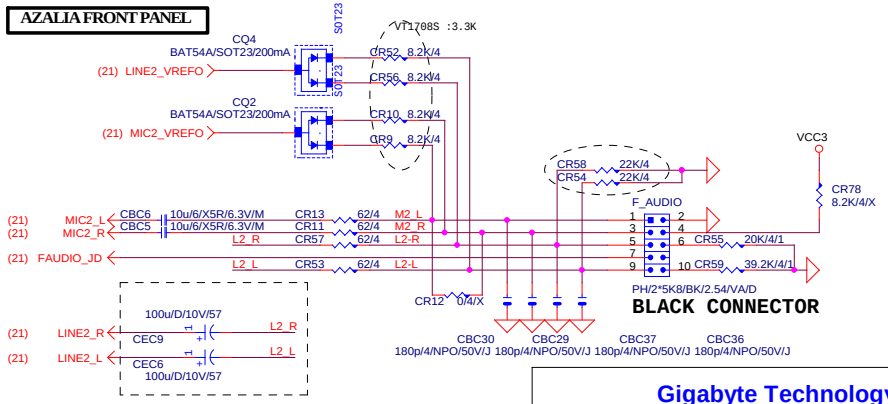
MIC-IN



SPDIF_OUT

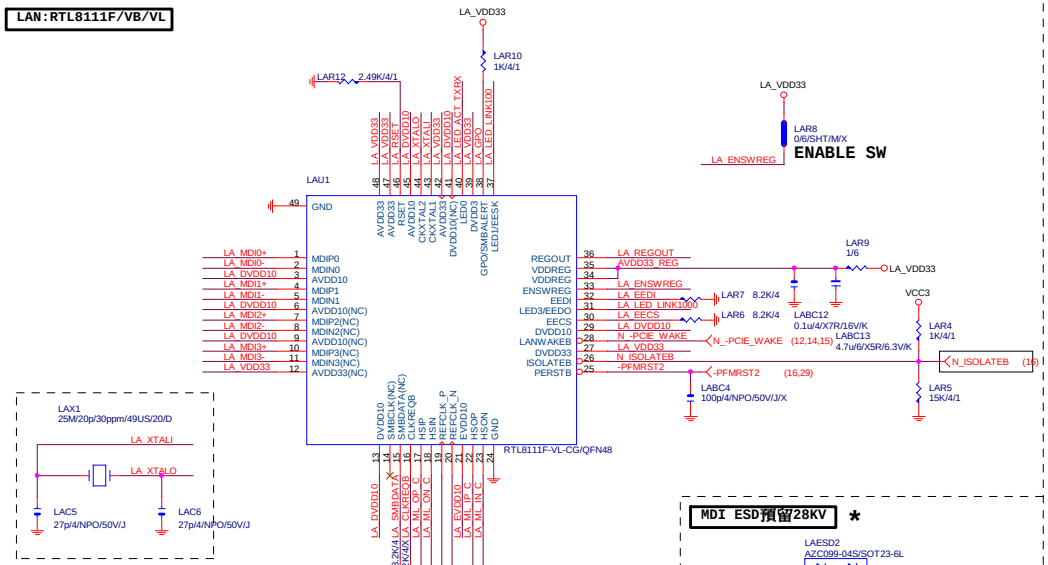


AZALIA FRONT PANEL



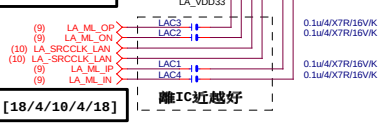
Gigabyte Technology		
Title: AUDIO JACK		
Size: Custom	Document Number: GA--H81M-H	Rev: 1.1
Date: Thursday, October 31, 2013	Sheet 22 of 29	

LAN:RTL8111F/VB/VL



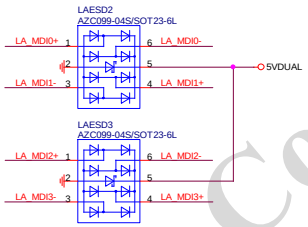
LA_ ML-->80歐姆:[15/5/5/5/15]

SRCCLK-->50歐姆:[18/4/10/4/18]

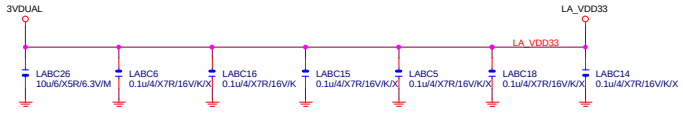


離IC近越好

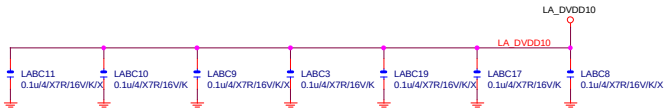
MDI ESD預留28KV *



LAN POWER

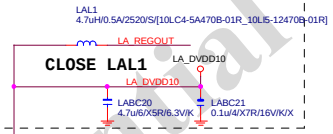


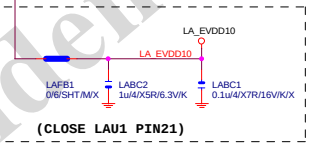
(CLOSE LAU1 PIN:12,27,39,42,47,48)



(CLOSE LAU1 PIN3,6,9,13,29,41,45)

(CLOSE LAU1 PIN36)





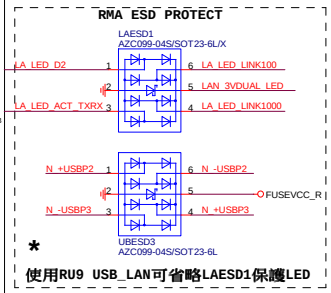
(CLOSE LAU1 PIN21)

Power domain chart

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

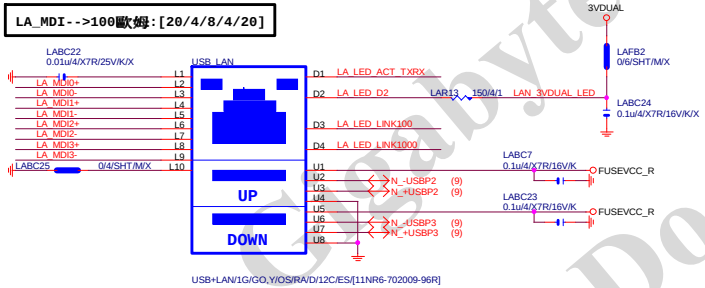
USB_LAN CONNECTOR

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]



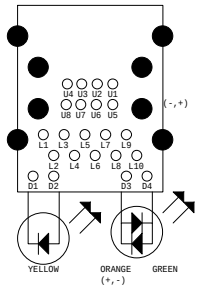
USB+LAN/1G/GQ,Y/OS/RA/D/12C/ES/[11NR6-702009-96R]

USB X3 POWER

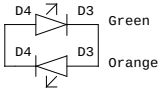
EMI SHORT PAD

PS:視EMI需求

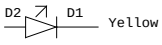
注意:USB PORT(目前:暫代6,7PORT)
USB-->90歐姆:[15/4.5/7.5/4.5/15]



Dual Color LED



Single Color LED



BOM NOTICE *

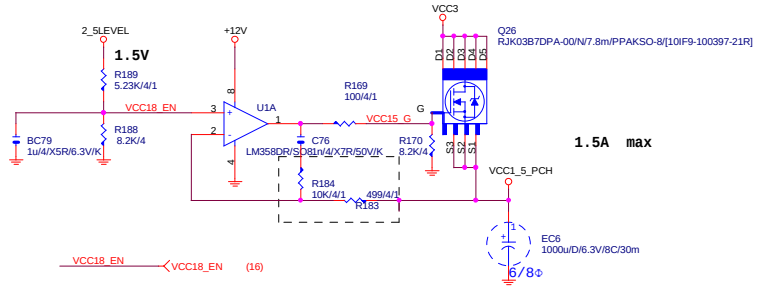
料號	規格	廠商
11NR6-702009-96R	1G LAN (12core)	UDE(RU9 ESD+)

[LED獨立走線,可省略外加AZC099料件LAESD1]

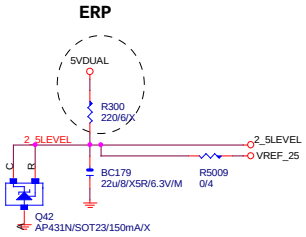
1. 9KV ESD BOM:
   USB_LAN (RU9):11NR6-702009-96R
2. 28KV ESD BOM:
   USB_LAN (RU9):11NR6-702009-96R
   LAESD2,LAESD3:上件AZC398-04S

Gigabyte Technology			
Title: Realtek RTL8111G			
Size: Custom	Document Number: GA--H81M-H		Rev: 1.1
Date: Thursday, October 31, 2013	Sheet 23 of 29		

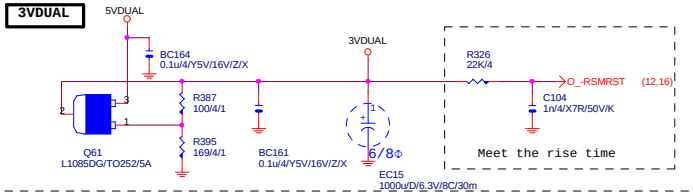
VCC1_8_PCH



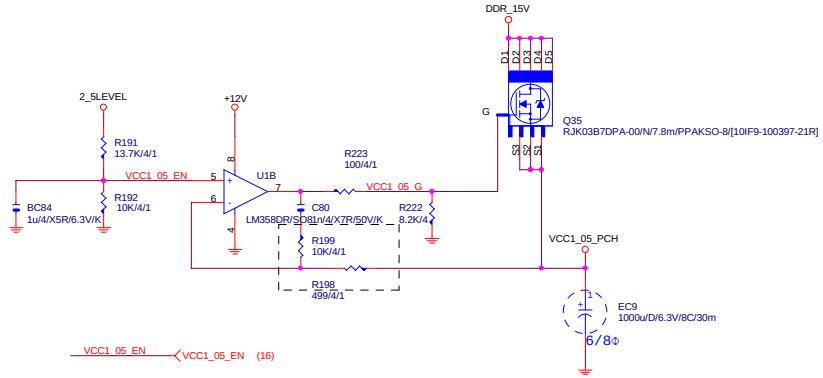
2_5LEVEL

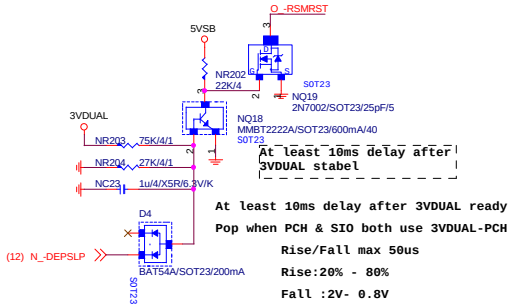


3VDUAL

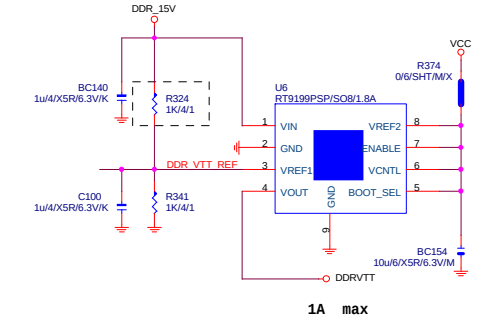


VCC1_05_PCH

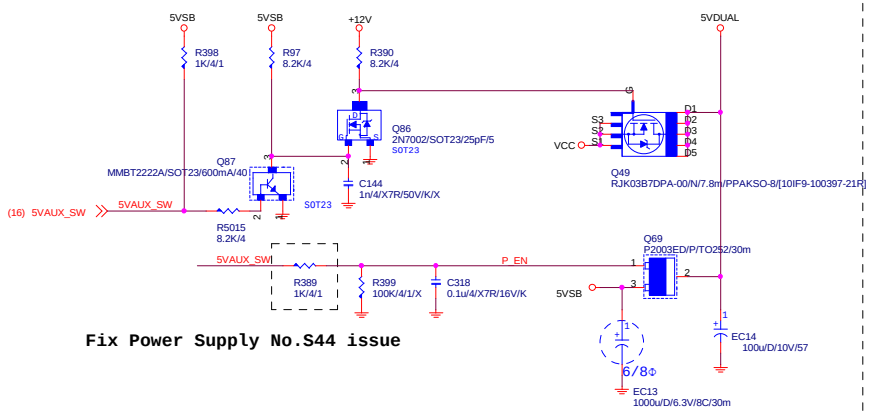




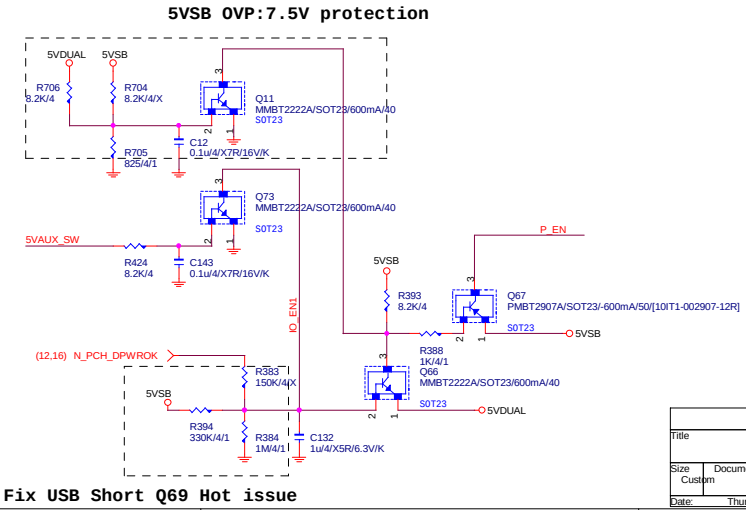
DDRVTT



5VDUAL



5VDUAL SHORT PROTECT



Gigabyte Technology		
Title: DISCRETE POWER		
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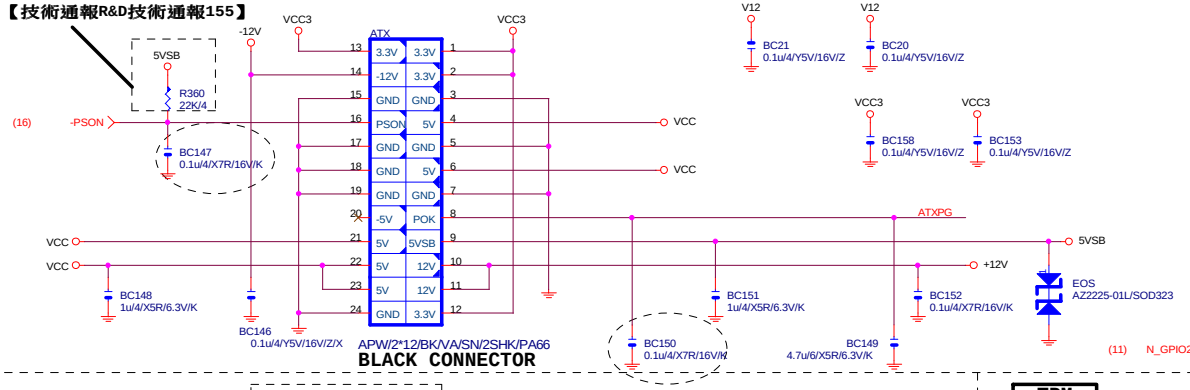
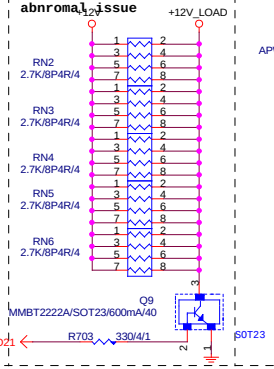
ATXX24 POWER CONNECTOR

【技術通報R&D技術通報155】

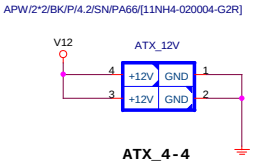


【技術通報R&D技術通報153】

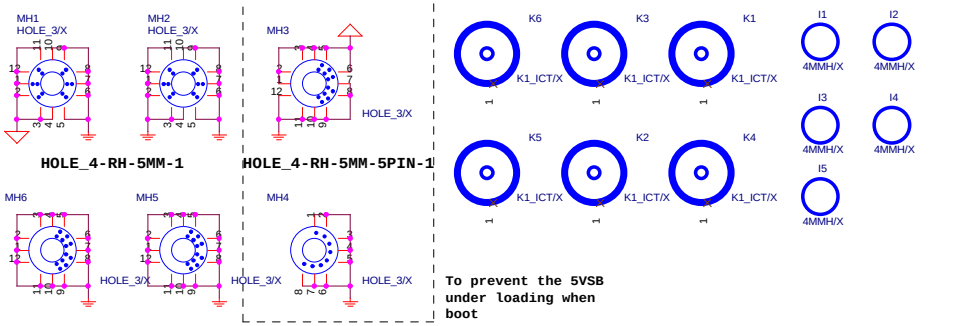
To fix 12V light load abnroma l issue



ATXX4 POWER CONNECTOR



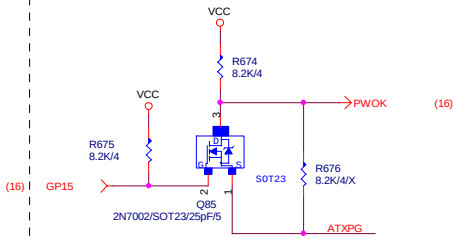
TPM

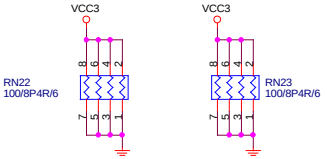


To prevent the 5VSB under loading when boot

PWOK PATCH

【技術通報R&D技術通報154】





FIX PWR MINMUN LOAD

Gigabyte Technology

Title: ATX CONNECTOR

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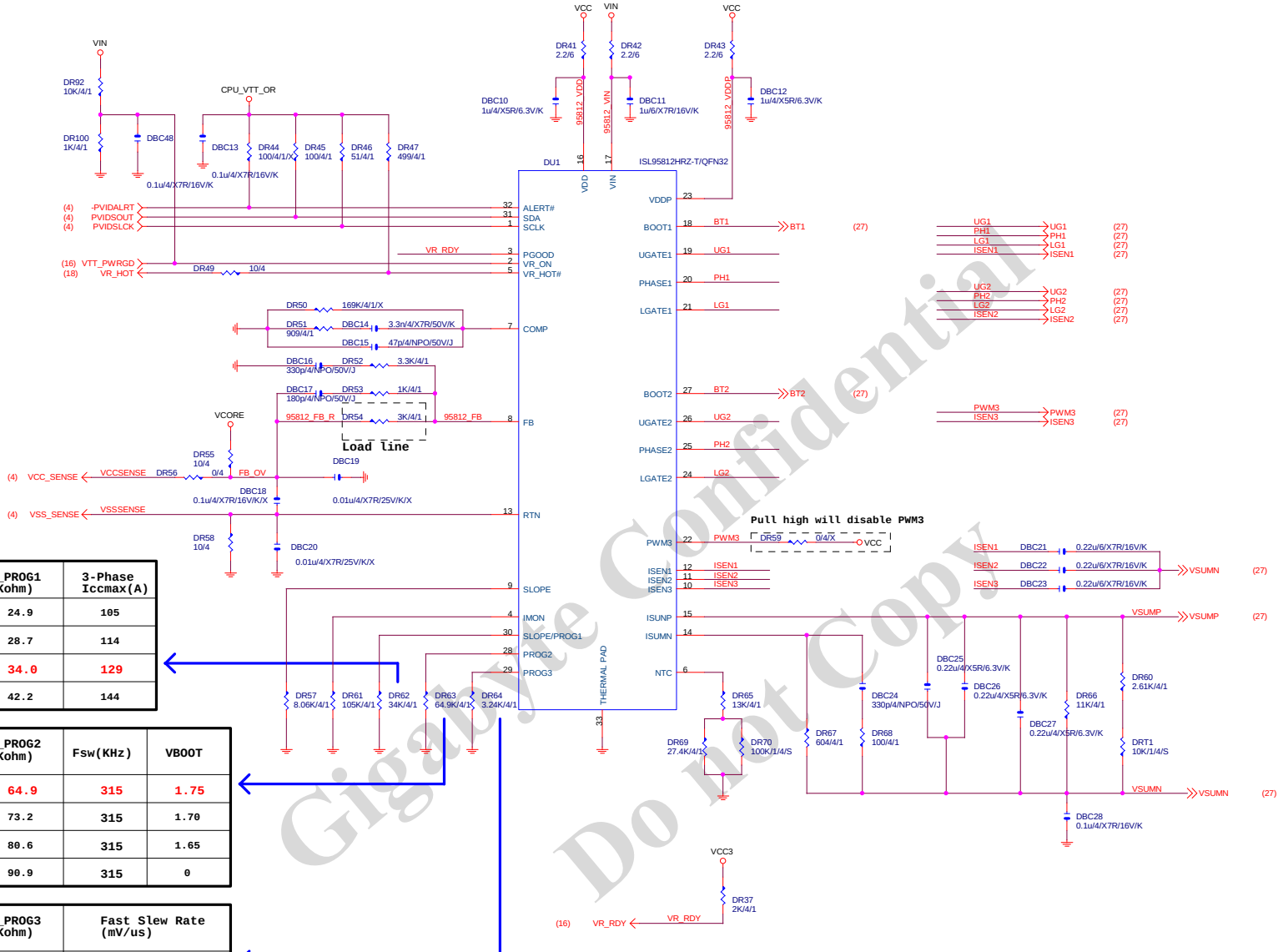

R_PROG1 (Kohm)	3-Phase Iccmax(A)
24.9	105
28.7	114
34.0	129
42.2	144

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-H		Rev: 1.1
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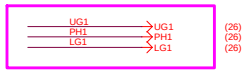
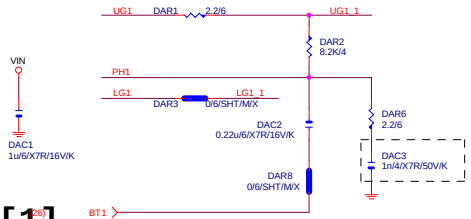
PHASE 1





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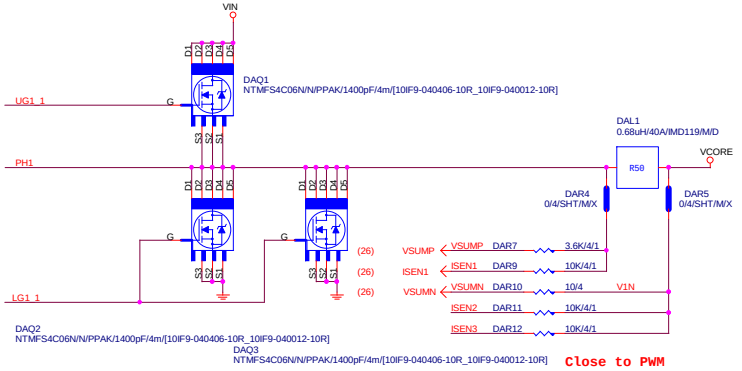
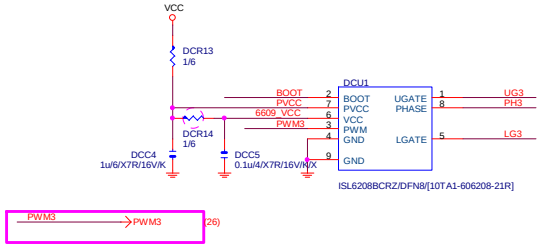
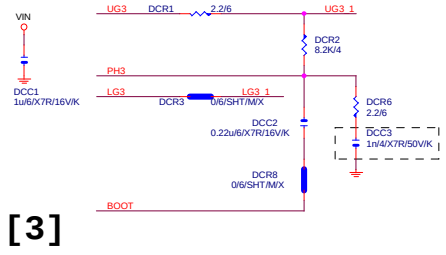


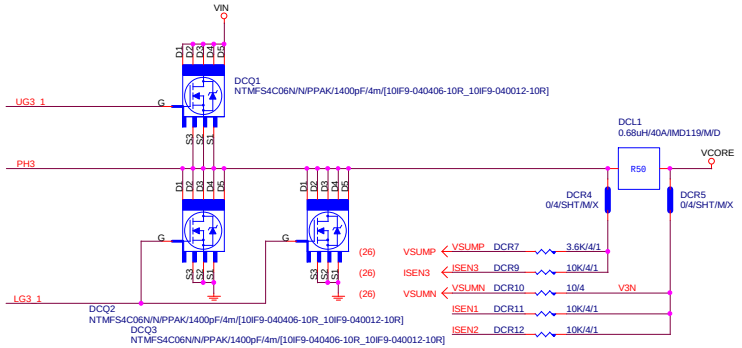
Close to PWM

PHASE 3



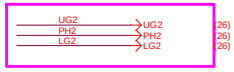


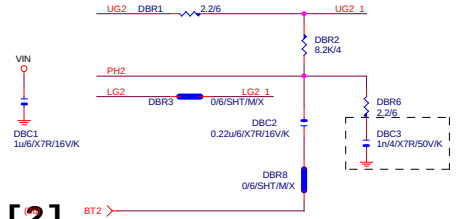
[3]



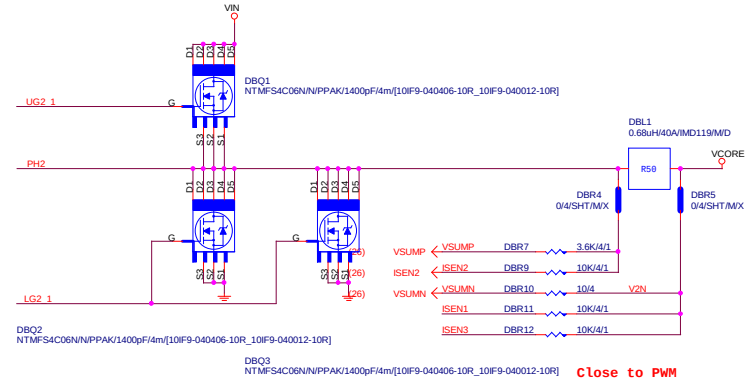
Close to PWM

PHASE 2

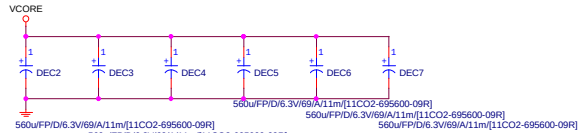


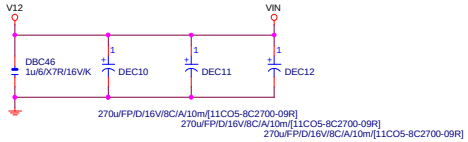


[2]



Close to PWM





Gigabyte Technology		
Title: CPU CORE VR-2		
Size: Custom	Document Number: GA--H81M-H	Rev: 1.1
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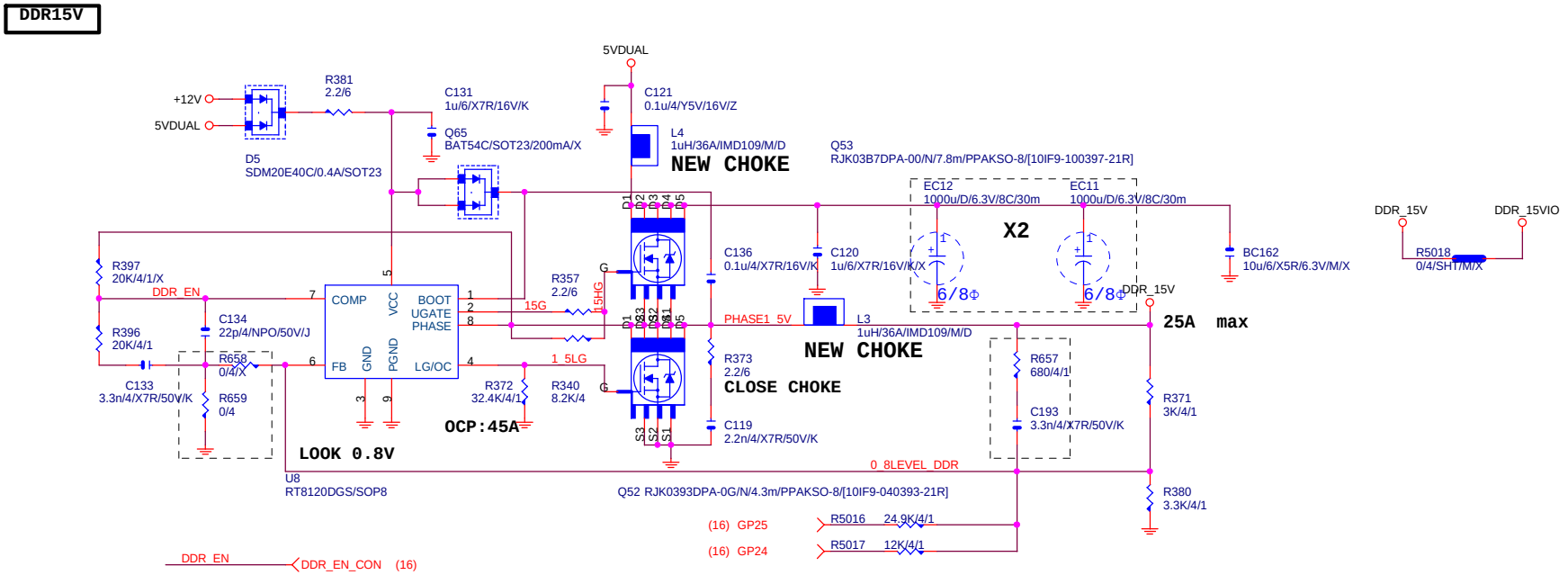

VIN=5V,VOUT=1.5V,IOUT=25A,PHASE=1
IRMS=11.45A

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-H		Rev: 1.1
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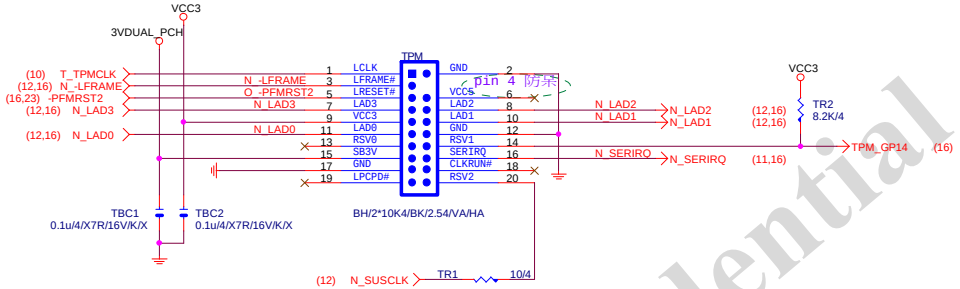
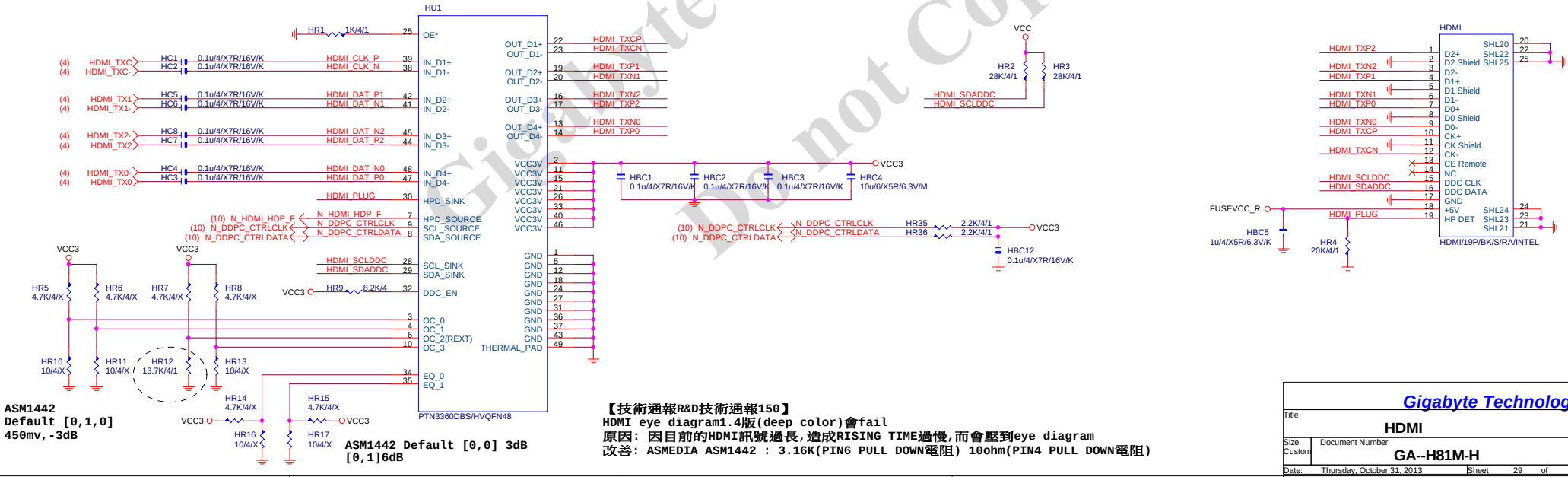
TPM CONNECT



HDMI LEVEL SHIFT

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



【技術通報R&D技術通報150】
HDMI eye diagram1.4版(deep color)會fail
原因: 因目前的HDMI訊號過長,造成RISING TIME過慢,而會壓到eye diagram
改善: ASMEDIA ASM1442 : 3.16K(PIN6 PULL DOWN電阻) 10ohm(PIN4 PULL DOWN電阻)

Gigabyte Technology

Title	HDMI	
Size: Custom	Document Number: GA--H81M-H	Rev: 1.1
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