Model Name: GA-H81M-S

Revision 1.0

SHEET	TITLE
01	COVER SHEET
02	BOM & PCB MODIFY HISTORY
03	BLOCK DIAGRAM
04	CPU_LGA1150-A
05	CPU_LGA1150-B
06	CPU_LGA1150-C
07	DDR III CHANNEL A
08	DDR III CHANNEL B
09	PCH_FDI,DMI,USB,PCIE,NVRAM
10	PCH_DP,CLK BUFFER
11	PCH_HOST,SATA,PCI
12	PCH_GPIO,CTRL,AUDIO
13	PCH_PWR,GND
14	PCI EXPRESS*16 SLOT
15	PCI EXPRESS X1 *1 SLOT
16	ITE 8620 LPC IO
17	COM,KB_MS_USB,USB30_20
18	HWM,FAN CTRL,OV,-PROCHOT
19	DUAL BIOS
20	FP,FUSB,SPK,SATALED
21	Realtek ALC887-VD2
22	REAR AUDIO JACK
23	REALTEK RTL8111G
24	DISCRETE POWER
25	ATX , CLOCK GEN
26	VCORE ISL95812_1
27	VCORE ISL95812_2

SHEET	TITLE
28	RT8120_DDR POWER

Gigabyte Technology

Title: Cover Sheet		
Size: Custom	Document Number: GA-H81M-S	Rev: 1.0
Date: Wednesday, June 04, 2014	Sheet 1 of 29	

Model Name: GA-H81M-S

Revision 1.0

Circuit or PCB layout change

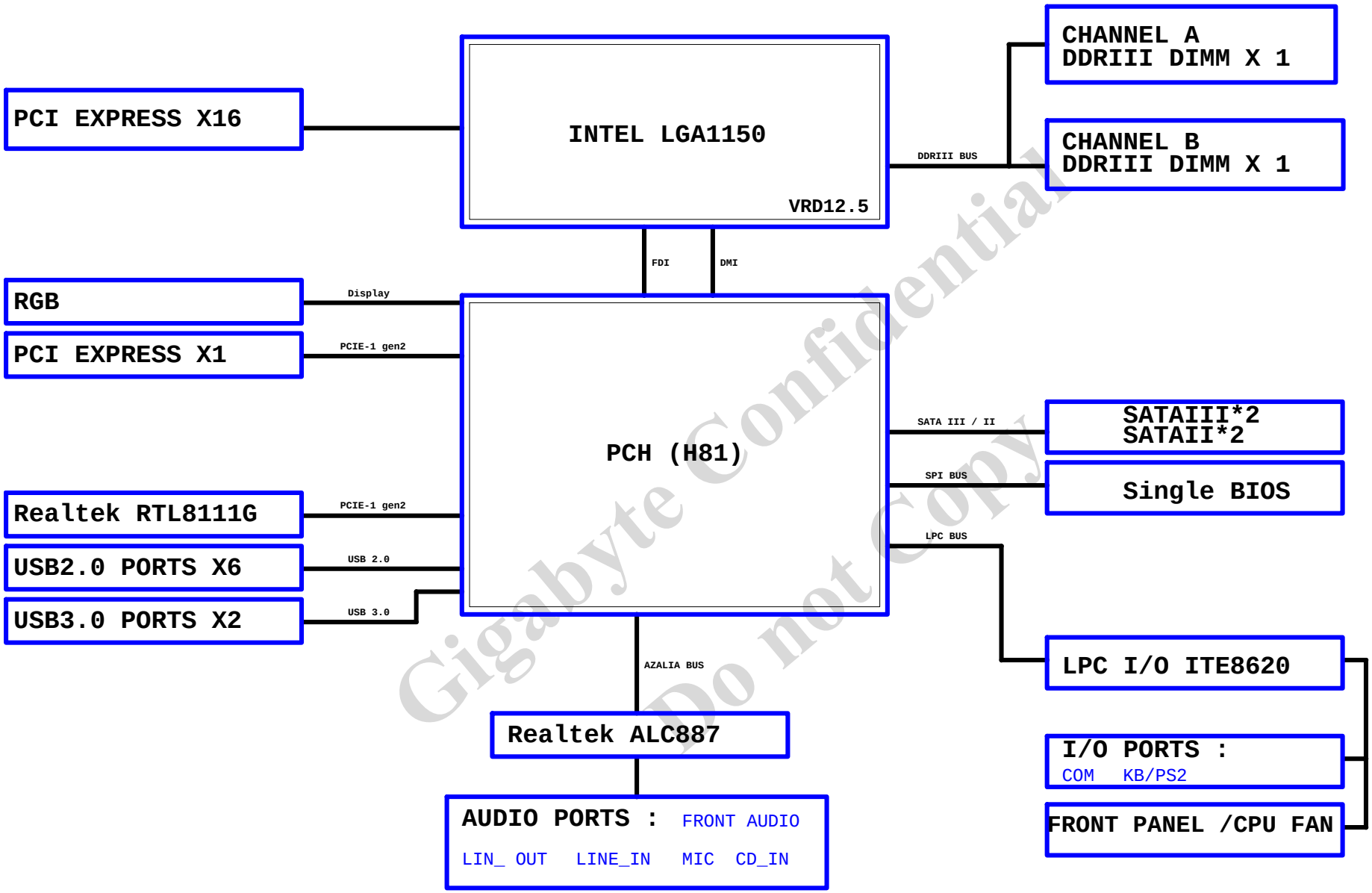
DATE	Change Item	Reason
2014/03/06	Change from H81M-S1 Rev 2.1 1、Del PCIEX1_2 2、Change RTL8111F to RTL8111G 3、Change PCB SIZE to 190*170 4、Change F_PANEL to 2*5	

Component value change history

2014/03/06

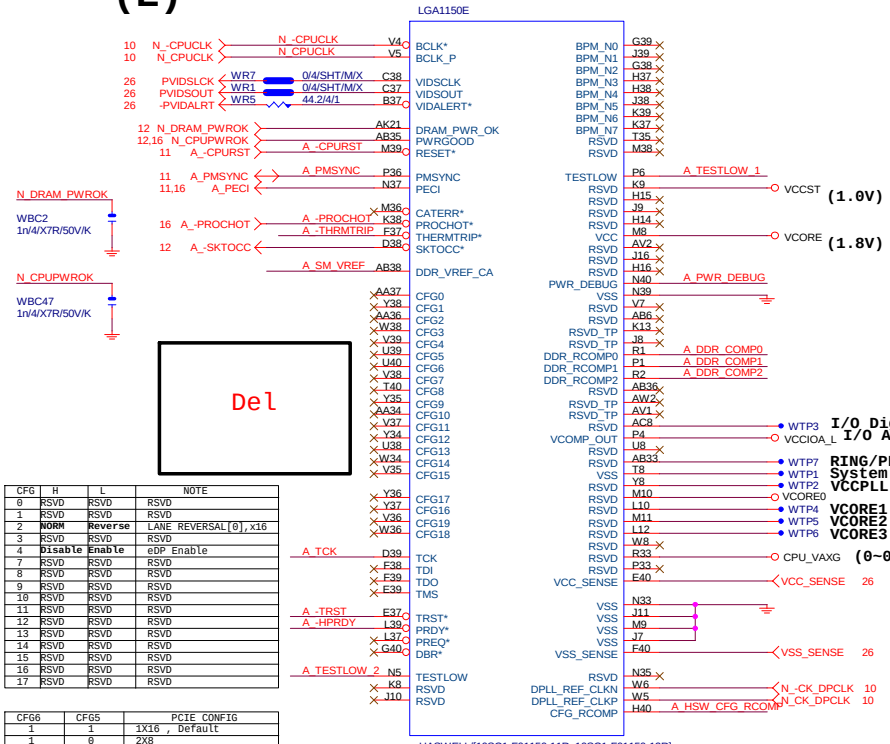
Data	Change Item	Reason

BLOCK DIAGRAM



Gigabyte Technology			
Title: BLOCK DIAGRAM			
Size: C	Document Number: GA-H81M-S		Rev: 1.0
Date: Wednesday, June 04, 2014	Sheet 3 of 29		

LGA1150 (E)

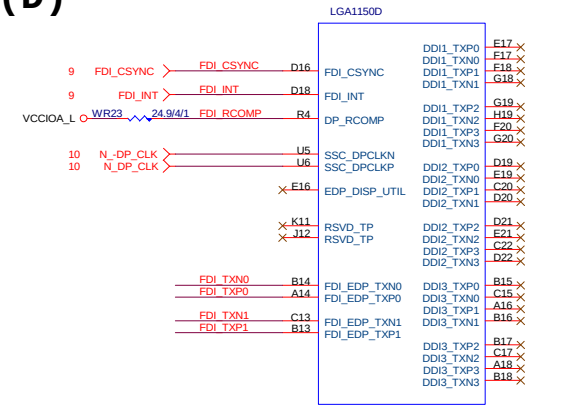


CFG	H	L	NOTE
0	RSVD	RSVD	RSVD
1	RSVD	RSVD	RSVD
2	**NORM**	**Reverse**	LANE REVERSAL[0],x16
3	RSVD	RSVD	RSVD
4	**Disable**	**Enable**	eDP Enable
7	RSVD	RSVD	RSVD
8	RSVD	RSVD	RSVD
9	RSVD	RSVD	RSVD
10	RSVD	RSVD	RSVD
11	RSVD	RSVD	RSVD
12	RSVD	RSVD	RSVD
13	RSVD	RSVD	RSVD
14	RSVD	RSVD	RSVD
15	RSVD	RSVD	RSVD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

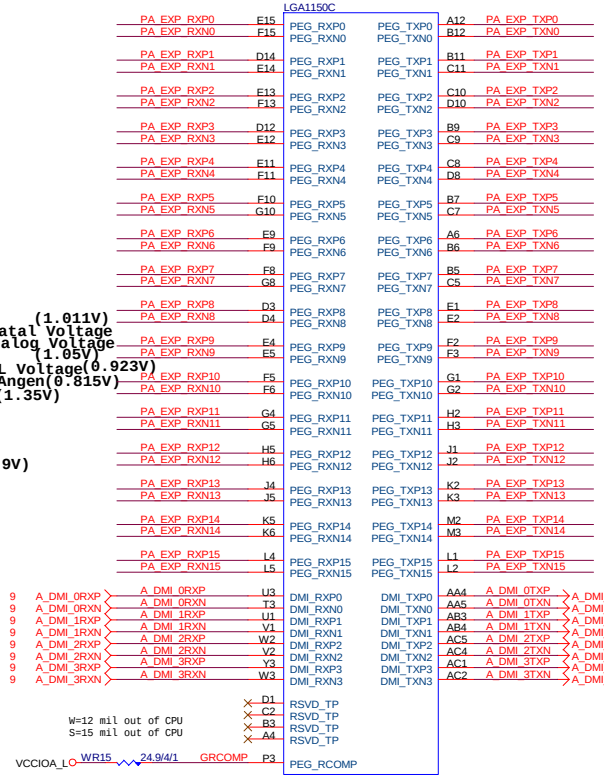
LGA1150 (D)



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

LGA1155 (C)

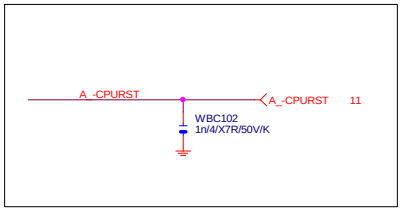
PCIEX16:16/5/5/5/16(breakout min 10/4/4/4/10)
Impedance=80 +- 17.5%



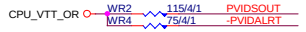
DMI:12/4/4/4/12(breakout min 8/4/4/4/8)
Impedance=85 +- 17.5%

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

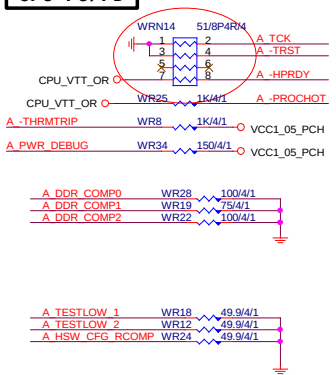
-CPURST



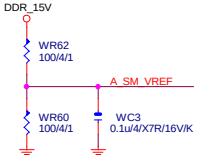
CPU SVID



CPU PU/PD



SM REF



Gigabyte Technology		
Title: CPU LGA1150-A		
Size: Custom	Document Number: GA-H81M-S	Rev: 1.0
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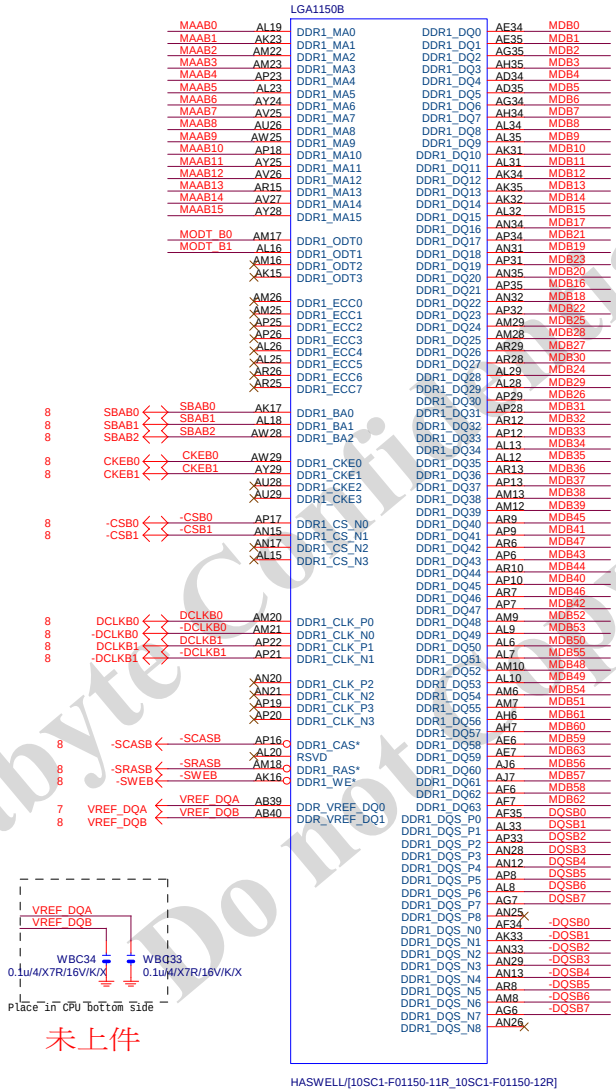
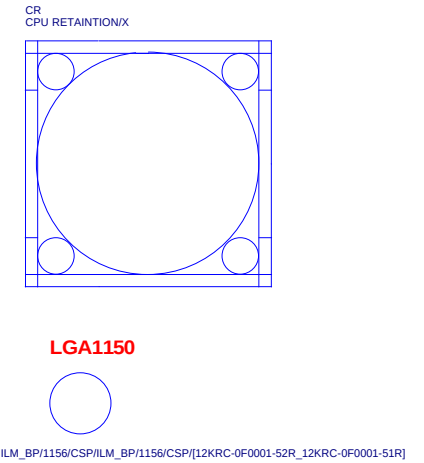
LGA1150 (A)

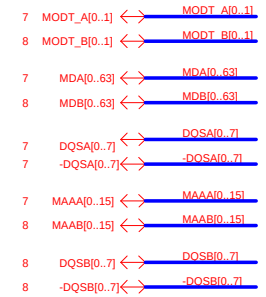
LGA1150 (B)



LGA1150 (CR)

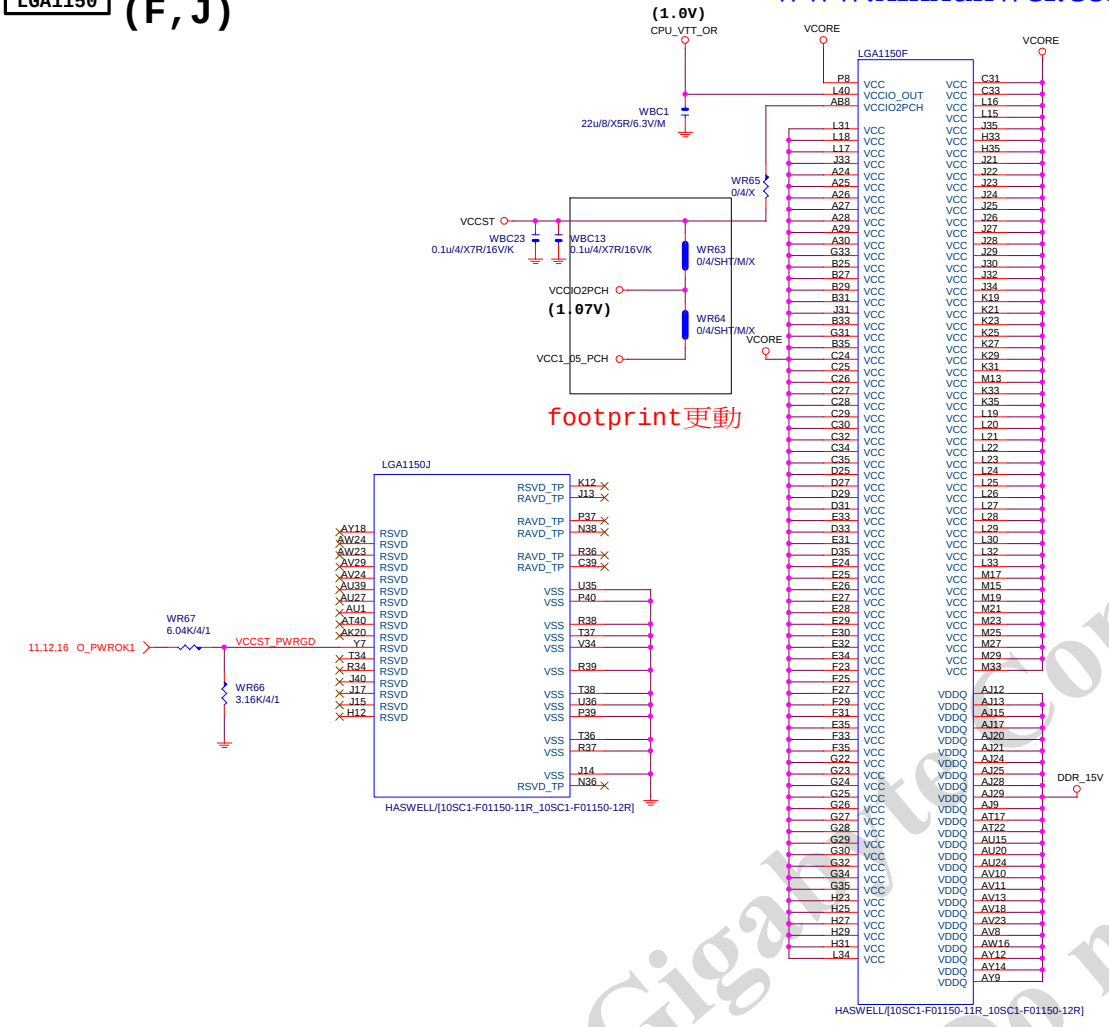


DDR BUS



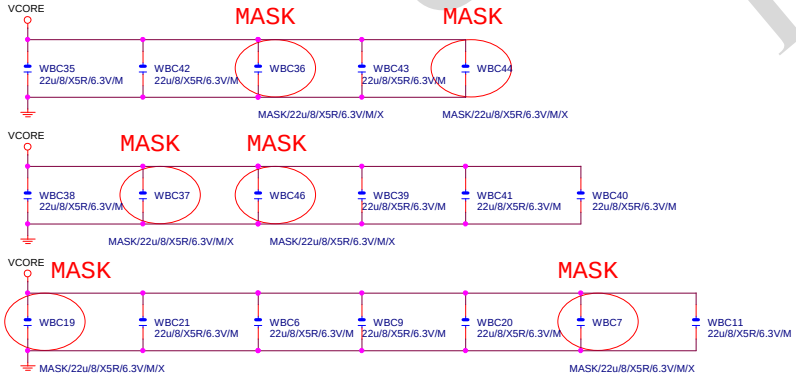
Gigabyte Technology			
Title: CPU LGA1150-B			
Size: Custom	Document Number: GA-H81M-S		Rev: 1.0
Date: Wednesday, June 04, 2014		Sheet 5 of 29	

LGA1150 (F,J)

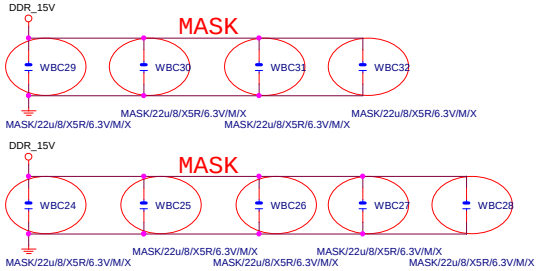


LGA1155 (G,H,I)

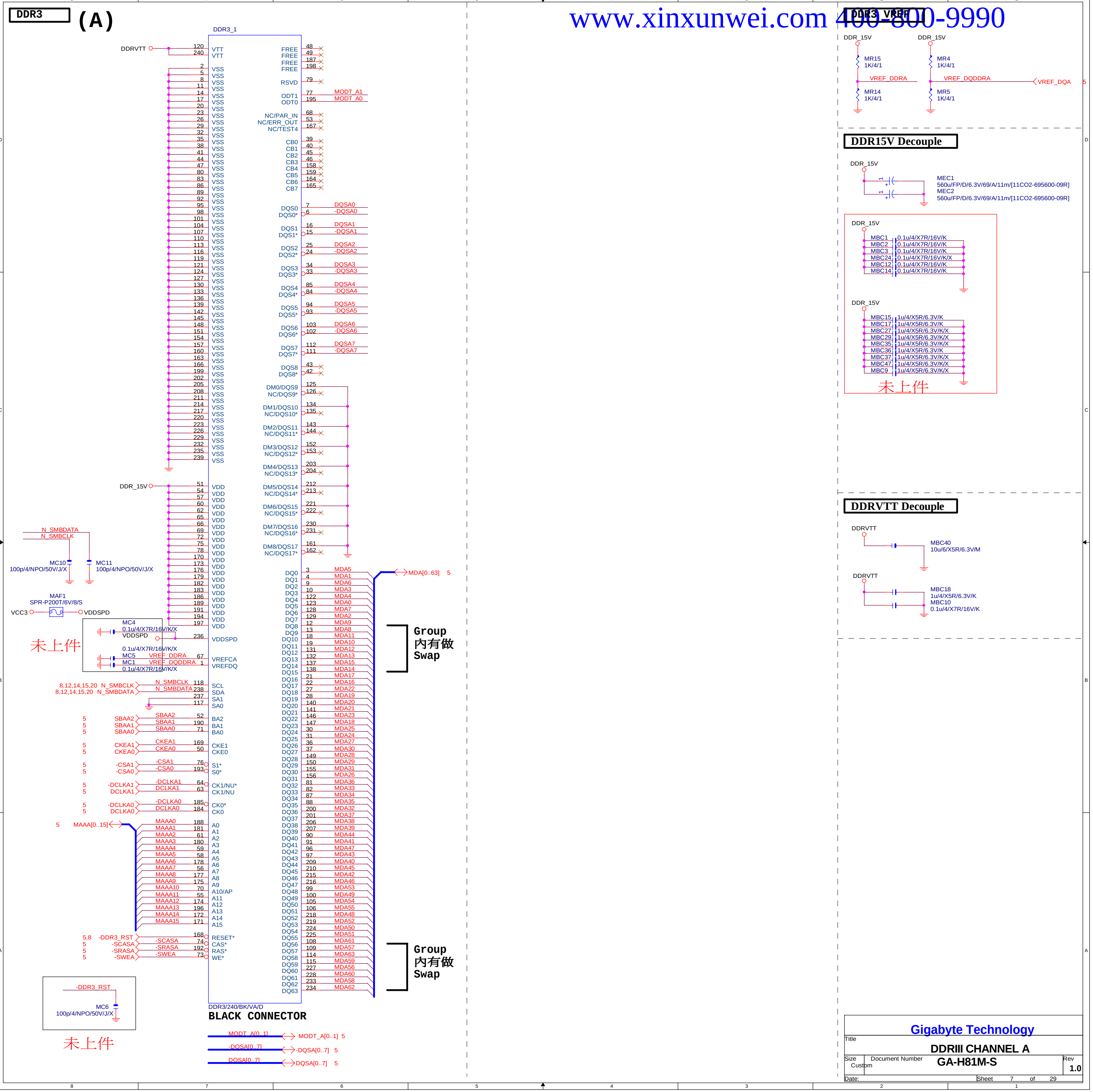
VCore CAP (X18)

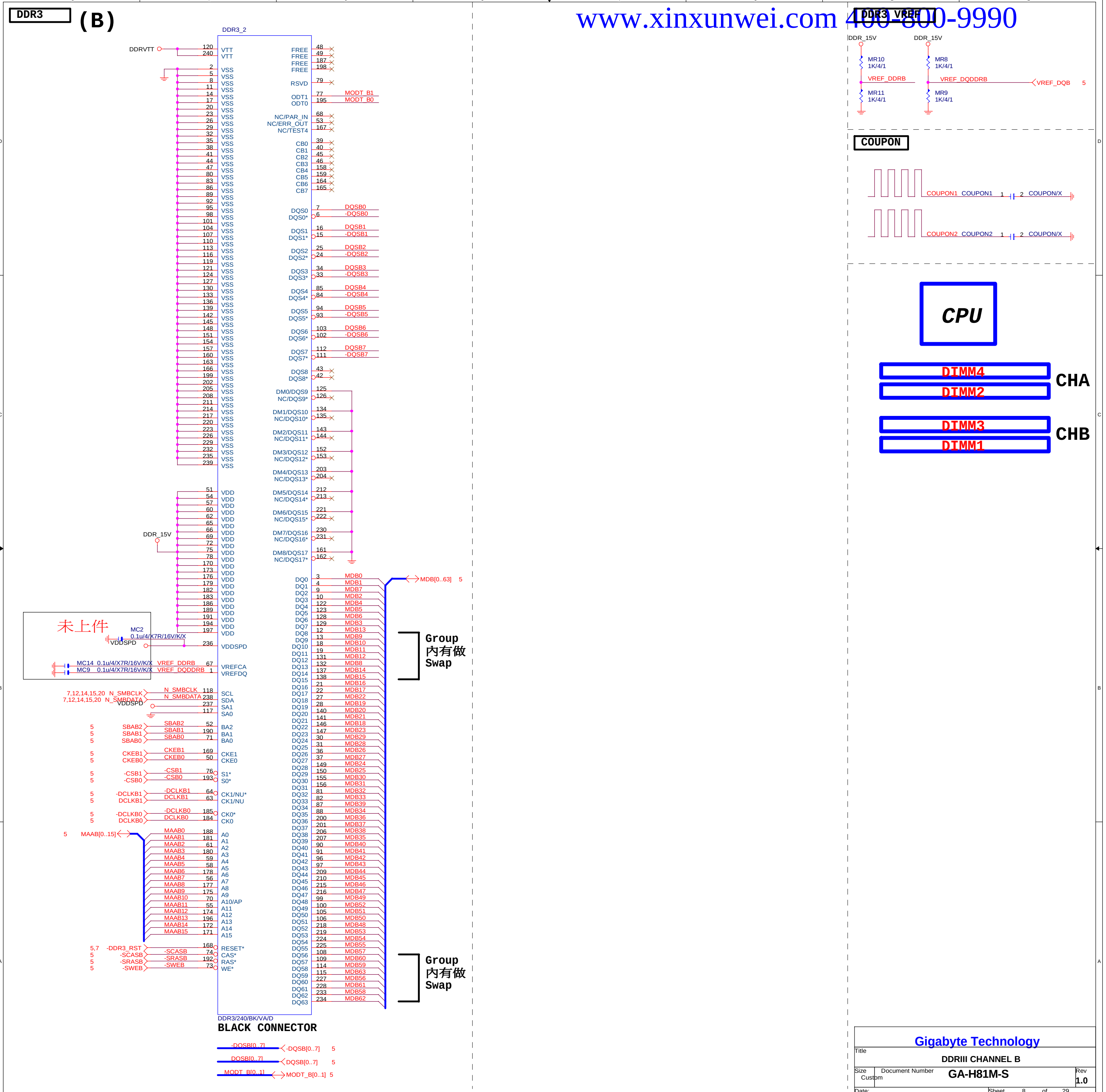


DDR CAP (X9)



Gigabyte Technology		
Title: CPU LGA1150-C		
Size: Custom	Document Number: GA-H81M-S	Rev: 1.0
Date: Wednesday, June 04, 2014	Sheet 6 of 29	


DDR3 (A)
DDR3_1
DDRVTT
VTT
FREE
RSVD
ODT1
ODT0
MODT_A1
MODT_A0
NC/PAR_IN
NC/ERR_OUT
NC/TEST4
CB0
CB1
CB2
CB3
CB4
CB5
CB6
CB7
DQS0 … DQS8
DQSA0 … DQSA7
-DQSA0 … -DQSA7
DM0/DQS9 … DM8/DQS17
NC/DQS9* … NC/DQS17*
DQ0 … DQ63
MDA[0..63]
MDA0 … MDA63
VSS
DDR_15V
VDD
N_SMBDATA
N_SMBCLK
MC10 100p/4/NPO/50V/J/X
MC11 100p/4/NPO/50V/J/X
MAF1 SPR-P200T/6V/8/S
VCC3
VDDSPD
MC4 0.1u/4/X7R/16V/K/X
MC5 0.1u/4/X7R/16V/K/X
MC1 0.1u/4/X7R/16V/K/X
VREF_DDRA
VREF_DQDDRA
VREFCA
VREFDQ
未上件
SCL
SDA
SA1
SA0
SBAA2
SBAA1
SBAA0
BA2
BA1
BA0
CKEA1
CKEA0
CKE1
CKE0
-CSA1
-CSA0
S1*
S0*
-DCLKA1
DCLKA1
-DCLKA0
DCLKA0
CK1/NU*
CK1/NU
CK0*
CK0
MAAA[0..15]
MAAA0 … MAAA15
A0 … A15
A10/AP
-DDR3_RST
-SCASA
-SRASA
-SWEA
RESET*
CAS*
RAS*
WE*
MC6 100p/4/NPO/50V/J/X
未上件
Group 內有做 Swap
Group 內有做 Swap
DDR3/240/BK/VA/D
BLACK CONNECTOR
MODT_A[0..1]
-DQSA[0..7]
DQSA[0..7]
DDR3 VREF
MR15 1K/4/1
MR4 1K/4/1
MR14 1K/4/1
MR5 1K/4/1
VREF_DDRA
VREF_DQDDRA
VREF_DQA
DDR15V Decouple
MEC1 560u/FP/D/6.3V/69/A/11m/[11C02-695600-09R]
MEC2 560u/FP/D/6.3V/69/A/11m/[11C02-695600-09R]
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
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
未上件
DDRVTT Decouple
MBC40 10u/6/X5R/6.3V/M
MBC18 1u/4/X5R/6.3V/K
MBC10 0.1u/4/X7R/16V/K
Gigabyte Technology
Title DDRIII CHANNEL A
Size Custom
Document Number GA-H81M-S
Rev 1.0
Date:
Sheet 7 of 29



DDR3
(B)
DDR3_2
DDRVTT
VTT
VSS
VDD
DDR_15V
FREE
RSVD
ODT1
ODT0
MODT_B1
MODT_B0
NC/PAR_IN
NC/ERR_OUT
NC/TEST4
CB0
CB1
CB2
CB3
CB4
CB5
CB6
CB7
DQS0
DQS0*
DQSB0
-DQSB0
DM0/DQS9
NC/DQS9*
DQ0
MDB0
MDB[0..63]
未上件
MC2
0.1u/4/X7R/16V/K/X
VDDSPD
MC14 0.1u/4/X7R/16V/K/X
MC9 0.1u/4/X7R/16V/K/X
VREF_DDRB
VREF_DQDDRB
VREFCA
VREFDQ
7,12,14,15,20 N_SMBCLK
7,12,14,15,20 N_SMBDATA
SCL
SDA
SA1
SA0
SBAB2
SBAB1
SBAB0
BA2
BA1
BA0
CKEB1
CKEB0
CKE1
CKE0
-CSB1
-CSB0
S1*
S0*
-DCLKB1
DCLKB1
CK1/NU*
CK1/NU
-DCLKB0
DCLKB0
CK0*
CK0
MAAB[0..15]
A0
A10/AP
A15
-DDR3_RST
-SCASB
-SRASB
-SWEB
RESET*
CAS*
RAS*
WE*
Group
內有做
Swap
DDR3/240/BK/VA/D
BLACK CONNECTOR
-DQSB[0..7]
DQSB[0..7]
MODT_B[0..1]
DDR3 VREF
MR10
1K/4/1
MR8
1K/4/1
MR11
1K/4/1
MR9
1K/4/1
VREF_DDRB
VREF_DQDDRB
VREF_DQB
COUPON
COUPON1
COUPON2
COUPON/X
CPU
DIMM4
DIMM2
CHA
DIMM3
DIMM1
CHB

Gigabyte Technology			
Title	DDRIII CHANNEL B		
Size Custom	Document Number	GA-H81M-S	Rev 1.0
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_RCOMP PCIE_RCOMP CLKIN_DMI_N CLKIN_DMI_P

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

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

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

OC0B_GP59 OC1B_GP40 OC2B_GP41 OC3B_GP42 OC4B_GP43 OC5B_GP9 OC6B_GP10 OC7B_GP14 USBRBIASB USBRBIAS CLKIN_DOT96N CLKIN_DOT96P

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

PCIE Only

8111G

PCIEx1

N/A

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

BD82B81/S/[10HB1-030H81-10R]

PCH (F)

PCHF

USB3_RXN_0 USB3_RXP_0 USB3_TXN_0 USB3_TXP_0 USB3_RXN_1 USB3_RXP_1 USB3_TXN_1 USB3_TXP_1 USB3_RXN_4 USB3_RXP_4 USB3_TXN_4 USB3_TXP_4 USB3_RXN_5 USB3_RXP_5 USB3_TXN_5 USB3_TXP_5

FDI_RXN_0 FDI_RXP_0 FDI_RXN_1 FDI_RXP_1 FDI_CSYNC FDI_INT FDI_RCOMP

FDI_TXN0 FDI_TXP0 FDI_TXN1 FDI_TXP1 FDI_CSYNC FDI_INT VCC1_5_PCH

TACH6_GP70 TACH7_GP71

BD82B81/S/[10HB1-030H81-10R]

FDI_TXP[0..1] FDI_TXN[0..1]

N/A

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

Mount for integrated clock Generation Mode

NRN16 8.2K/8P4R/4

NR225 short to GND in non graphic SKU

PCH (J)

PCHJ

VSS_NCTF

BD82B81/S/[10HB1-030H81-10R]

PCH H/S

LOW COST ICH7 HEATSINK

SB_HEATSIN

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-S | Rev: 1.0

Date: Wednesday, June 04, 2014 | Sheet 9 of 29

PCH (E)

PCHE

BD82B81/S/[10HB1-030H81-10R]

PCH (G)

PCHG

Flex1,2,3,4 :
14/24/33/48MHZ

BD82B81/S/[10HB1-030H81-10R]

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

PCIEx16

PCIEx1

8111F

PCIEx1

8892

PCH CLK PD

Mount for integrated clock Generation Mode

VGA DDC

VGA CONNECTOR

VGA ESD

SSOP6_ESD

VGA DDC

未上件

Close to Filter

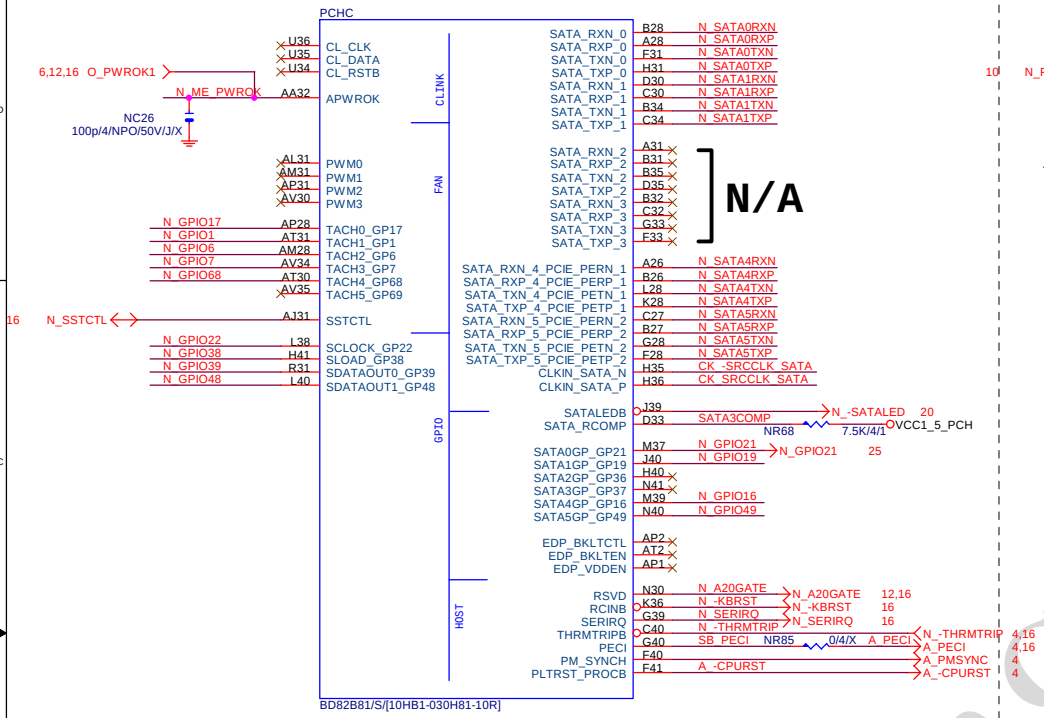
BLACK CONNECTOR

Gigabyte Technology

Title	PCH DISPLAY ,CLK BUFFER	
Size: Custom	Document Number: GA-H81M-S	Rev: 1.0
Date: Wednesday, June 04, 2014	Sheet 10 of 29	

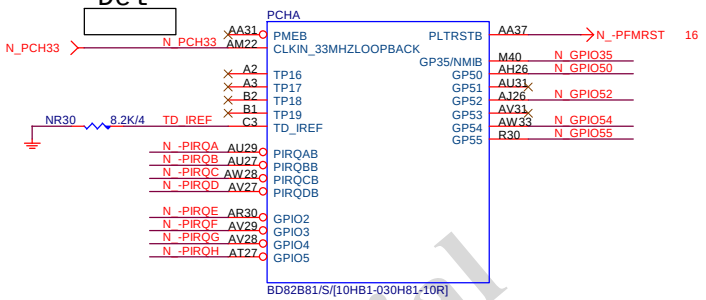
PCH (C)

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%

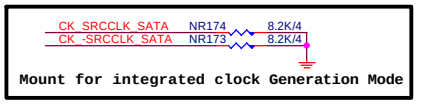


PCH (A)

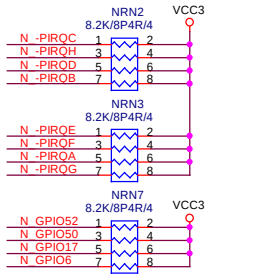
Del

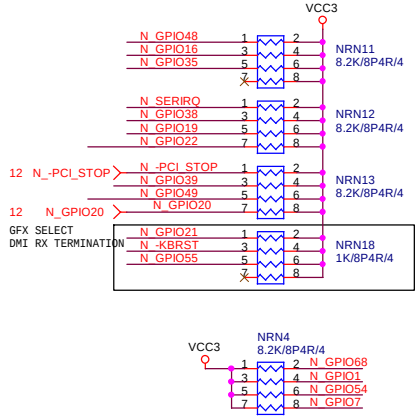


PCH CLK PD

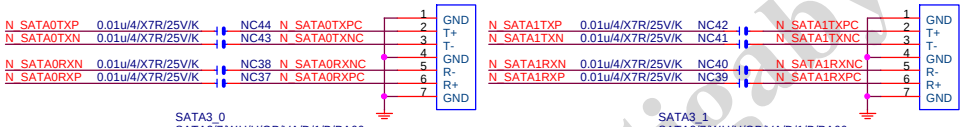


PCH PU/PD



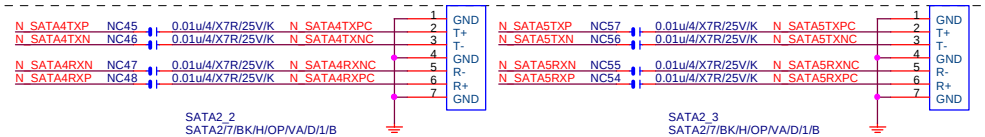


SATA CONNECTOR



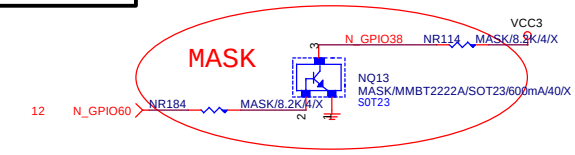
H81 Port 2/3 N/A

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



ME PWROK

GPIO38 Ctrl



Gigabyte Technology		
Title: PCH HOST , SATA, PCI		
Size: Custom	Document Number: GA-H81M-S	Rev: 1.0
Date: Wednesday, June 04, 2014	Sheet 11 of 29	

PCH (D)

PCHD

BD82B81/S/[10HB1-030H81-10R]

ACZ_SDOUT

PCH_DPWROK

PCH PU/PD

HSW_STRAP13

32.768KHZ

CLR_CMOS

At least 40ns lead fall to 0V before 3VDUAL_PCH fall to 2V

At least 10ms delay after 3VDUAL_PCH stabel

Reserve for EMI test

BATTERY-DUAL-4

RB 必须放在BAT外

Gigabyte Technology			
Title: PCH GPIO , CTRL , AUDIO			
Size: Custom	Document Number: GA-H81M-S		Rev: 1.0
Date: Wednesday, June 04, 2014	Sheet 12 of 29		

PCH (H)

VCC3_DAC

3VDUAL_PCH

SHT PWR

CLOSE北橋(注意震盪水波紋)

(3.3V/70mA+360uA)

CAP

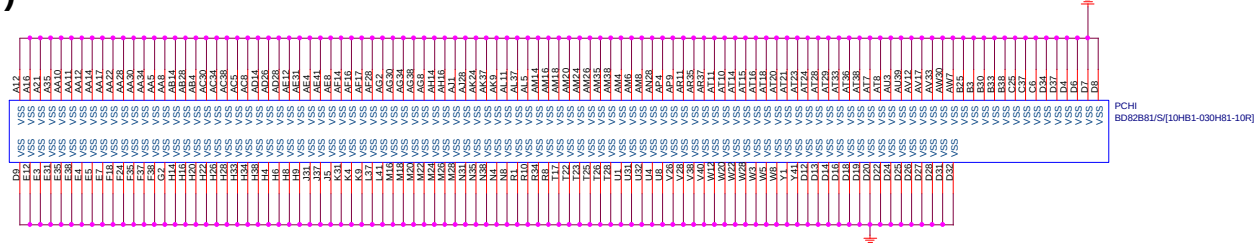
(3.3V)(X6)

(1.05V)(X2)

(3.3V)(X2)

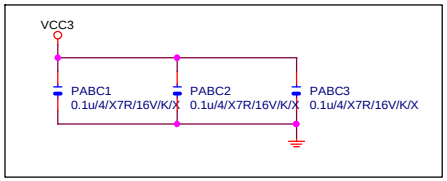
(1.05V)(X10)

PCH (I)

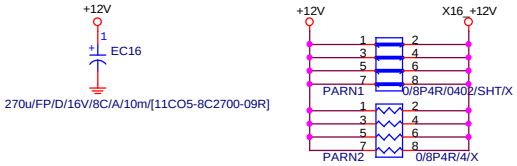


Gigabyte Technology	
Title	PCH PWR ,GND
Size: Custom	Document Number: GA-H81M-S
Rev	1.0
Date: Wednesday, June 04, 2014	Sheet 13 of 29

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

PCIEX16

		X16_+12V			
	B1	12V	PRSNT1*	A1	
	B2	12V	12V	A2	
	B3	RSVD	12V	A3	
PAR3 0/4/SHT/M/X	B4	GND	GND	A4	PAR1 0/4/SHT/M/X
7,8,12,15,20 N_SMBCLK SMBCLK	B5	SMCLK	JTAG2	A5	
7,8,12,15,20 N_SMBDATA SMBDATA	B6	SMDAT	JTAG3	A6	
	B7	GND	JTAG4	A7	
3VDUAL VCC3	B8	3.3V	JTAG5	A8	PAR2 0/4/SHT/M/X
	B9	JTAG1	3.3V	A9	VCC3
	B10	3.3VAUX	3.3V	A10	
12,15,23 N_-PCIE_WAKE	B11	WAKE*	PWRGD	A11	-PCIE_RST 15,16
		KEY			
	B12	RSVD	GND	A12	
	B13	GND	REFCLK+	A13	PA_SRCCLK_3GIO 10
PA_EXP_TXP0_C	B14	HSOP0	REFCLK-	A14	PA_-SRCCLK_3GIO 10
PA_EXP_TXN0_C	B15	HSON0	GND	A15	
	B16	GND	HSIP0	A16	PA_EXP_RXP0
	B17	PRSNT2*	HSIN0	A17	PA_EXP_RXN0
	B18	GND	GND	A18	
PA_EXP_TXP1_C	B19	HSOP1	RSVD	A19	
PA_EXP_TXN1_C	B20	HSON1	GND	A20	
	B21	GND	HSIP1	A21	PA_EXP_RXP1
	B22	GND	HSIN1	A22	PA_EXP_RXN1
PA_EXP_TXP2_C	B23	HSOP2	GND	A23	
PA_EXP_TXN2_C	B24	HSON2	GND	A24	
	B25	GND	HSIP2	A25	PA_EXP_RXP2
	B26	GND	HSIN2	A26	PA_EXP_RXN2
PA_EXP_TXP3_C	B27	HSOP3	GND	A27	
PA_EXP_TXN3_C	B28	HSON3	GND	A28	
	B29	GND	HSIP3	A29	PA_EXP_RXP3
	B30	RSVD	HSIN3	A30	PA_EXP_RXN3
	B31	PRSNT2*	GND	A31	
	B32	GND	RSVD	A32	
PA_EXP_TXP4_C	B33	HSOP4	RSVD	A33	
PA_EXP_TXN4_C	B34	HSON4	GND	A34	
	B35	GND	HSIP4	A35	PA_EXP_RXP4
	B36	GND	HSIN4	A36	PA_EXP_RXN4
PA_EXP_TXP5_C	B37	HSOP5	GND	A37	
PA_EXP_TXN5_C	B38	HSON5	GND	A38	
	B39	GND	HSIP5	A39	PA_EXP_RXP5
	B40	GND	HSIN5	A40	PA_EXP_RXN5
PA_EXP_TXP6_C	B41	HSOP6	GND	A41	
PA_EXP_TXN6_C	B42	HSON6	GND	A42	
	B43	GND	HSIP6	A43	PA_EXP_RXP6
	B44	GND	HSIN6	A44	PA_EXP_RXN6
PA_EXP_TXP7_C	B45	HSOP7	GND	A45	
PA_EXP_TXN7_C	B46	HSON7	GND	A46	
	B47	GND	HSIP7	A47	PA_EXP_RXP7
	B48	PRSNT2*	HSIN7	A48	PA_EXP_RXN7
	B49	GND	GND	A49	
PA_EXP_TXP8_C	B50	HSOP8	RSVD	A50	
PA_EXP_TXN8_C	B51	HSON8	GND	A51	
	B52	GND	HSIP8	A52	PA_EXP_RXP8
	B53	GND	HSIN8	A53	PA_EXP_RXN8
PA_EXP_TXP9_C	B54	HSOP9	GND	A54	
PA_EXP_TXN9_C	B55	HSON9	GND	A55	
	B56	GND	HSIP9	A56	PA_EXP_RXP9
	B57	GND	HSIN9	A57	PA_EXP_RXN9
PA_EXP_TXP10_C	B58	HSOP10	GND	A58	
PA_EXP_TXN10_C	B59	HSON10	GND	A59	
	B60	GND	HSIP10	A60	PA_EXP_RXP10
	B61	GND	HSIN10	A61	PA_EXP_RXN10
PA_EXP_TXP11_C	B62	HSOP11	GND	A62	
PA_EXP_TXN11_C	B63	HSON11	GND	A63	
	B64	GND	HSIP11	A64	PA_EXP_RXP11
	B65	GND	HSIN11	A65	PA_EXP_RXN11
PA_EXP_TXP12_C	B66	HSOP12	GND	A66	
PA_EXP_TXN12_C	B67	HSON12	GND	A67	
	B68	GND	HSIP12	A68	PA_EXP_RXP12
	B69	GND	HSIN12	A69	PA_EXP_RXN12
PA_EXP_TXP13_C	B70	HSOP13	GND	A70	
PA_EXP_TXN13_C	B71	HSON13	GND	A71	
	B72	GND	HSIP13	A72	PA_EXP_RXP13
	B73	GND	HSIN13	A73	PA_EXP_RXN13
PA_EXP_TXP14_C	B74	HSOP14	GND	A74	
PA_EXP_TXN14_C	B75	HSON14	GND	A75	
	B76	GND	HSIP14	A76	PA_EXP_RXP14
	B77	GND	HSIN14	A77	PA_EXP_RXN14
PA_EXP_TXP15_C	B78	HSOP15	GND	A78	
PA_EXP_TXN15_C	B79	HSON15	GND	A79	
	B80	GND	HSIP15	A80	PA_EXP_RXP15
	B81	PRSNT2*	HSIN15	A81	PA_EXP_RXN15
	B82	RSVD	GND	A82	

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

BLACK CONNECTOR

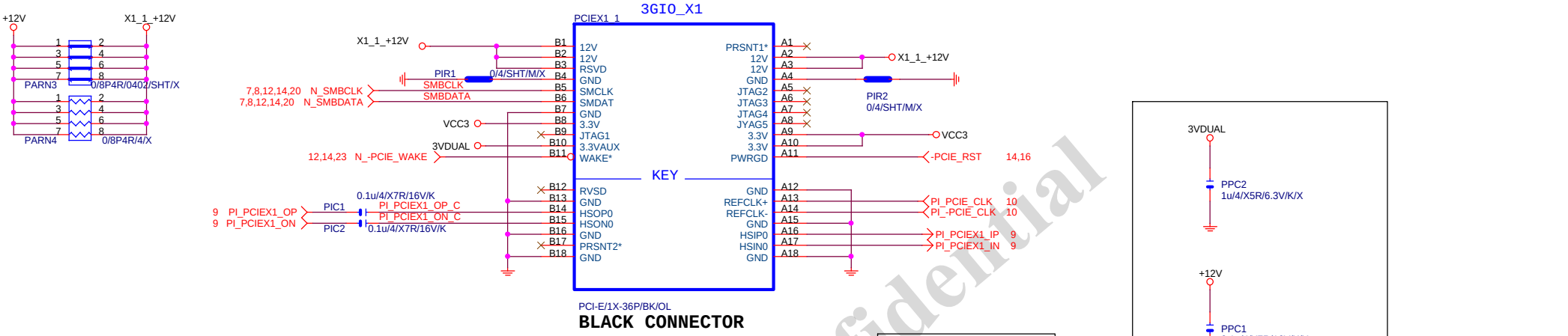
-PCIE_RST

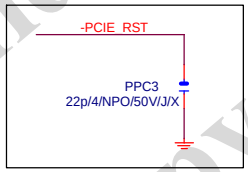
PAC1
22p/4/NPO/50V/J/X

Gigabyte Technology		
Title: PCI EXPRESS * 16		
Size: Custom	Document Number: GA-H81M-S	Rev: 1.0
Date: Wednesday, June 04, 2014	Sheet 14 of 29	

PCIEX1 SLOT

PCIEX1 PROTECT SHT





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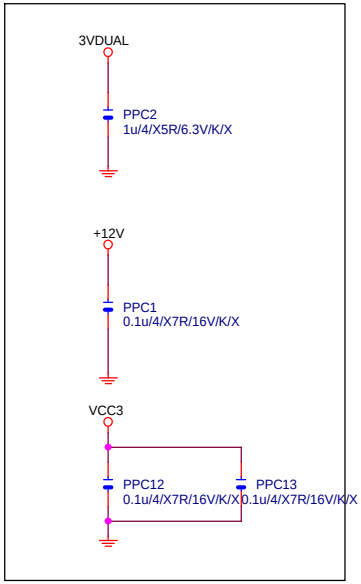

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Gigabyte Technology		
Title: PCI EXPRESS X 1 PORT		
Size: Custom	Document Number: GA-H81M-S	Rev: 1.0
Date: Wednesday, June 04, 2014	Sheet 15 of 29	

SIO IT8620

IT8620E_BX

PWR SHT

SIO PU

新增

-PCIRSTIN OR27 8.2K/4 VCC3

-PROCHOT_CON OR13 8.2K/4 VCC3

N_-LDRQ0 OR14 1K/4/1 VCC3

ITE_PWROK1 OR16 1K/4/1

-PCIE_RST OR17 1K/4/1

-PFMRST2 OR18 1K/4/1 VCC3

FANPWM1 OR19 8.2K/4 VCC

OR20 删除

SIO STRAP

H61M-S2 1.1 JP6 stuff pull down

ORN2 1K/8P4R/4

JP4 JP3 JP2 VCC3

JP5 OR24 8.2K/4/X OR25 8.2K/4/X VCC3

ITE recommand

EuP control by PCH

3VDUAL OR26 100/4/1 28_3VSB

JP3--- High SPI-Flash Disable
Low SPI-Flash Enable

-PRCOHOT

-THRMTRIP

DUAL BIOS OPT STRAP

SIO_18V

internal power pin, max 22nF cap

MB ID

SIO CAP

未上件

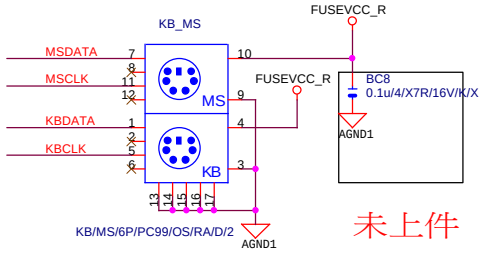
Gigabyte Technology		
Title: PCH GPIO , CTRL , AUDIO		
Size: C	Document Number: GA-H81M-S	Rev: 1.0
Date: Wednesday, June 04, 2014	Sheet 16 of 29	

COM

COM RI

KB/MS

KB_MS



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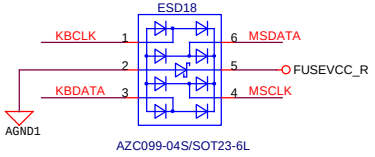
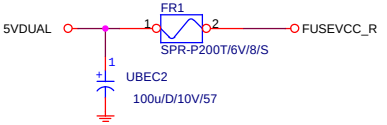
KB_MS ESD



USB2.0 PWR

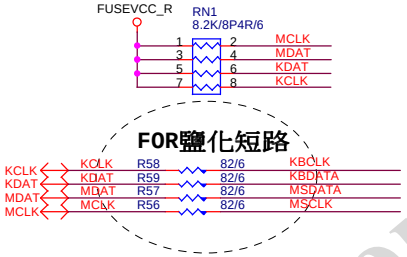
FUSE-0805

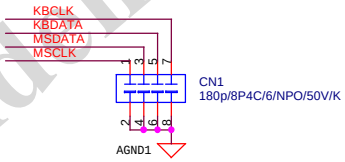


Close to connector

R707
0/6/X
AGND1

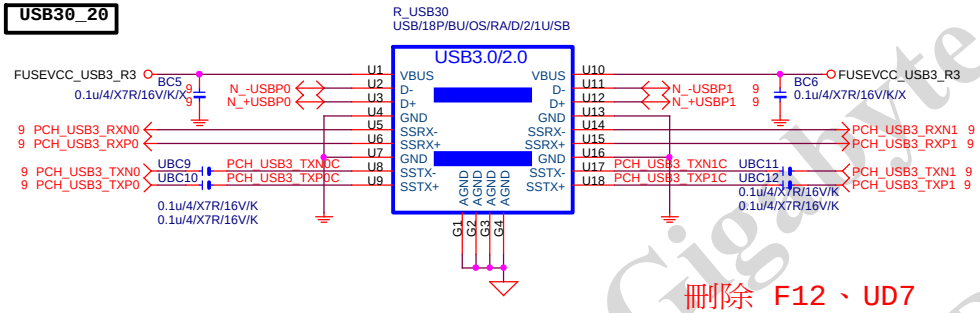
For EMI





16
16
16
16

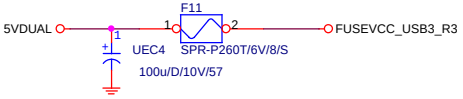
USB30_20



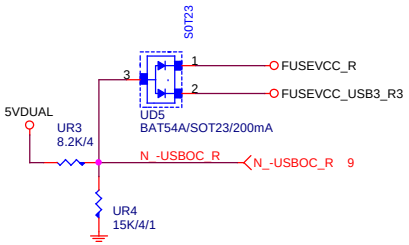
删除 F12、UD7

USB30_20 PWR

Polyswitch-1206

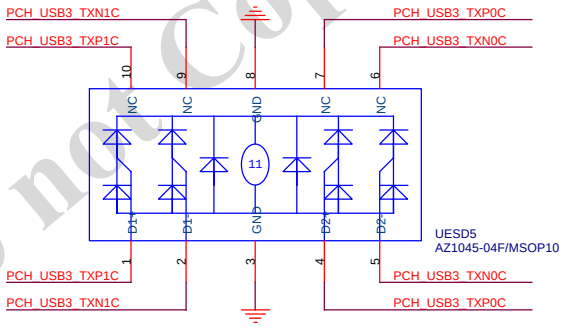


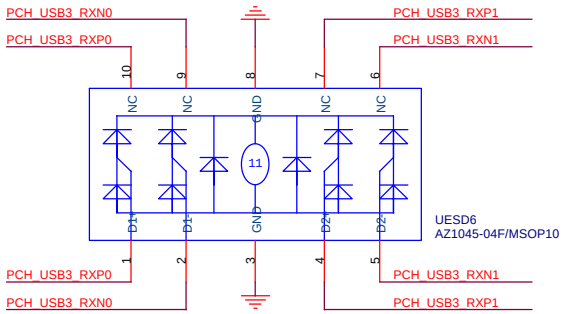
-USBOC_R0



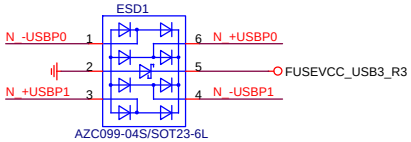
USB30_20 ESD PROCTECT

USB3.0 ESD



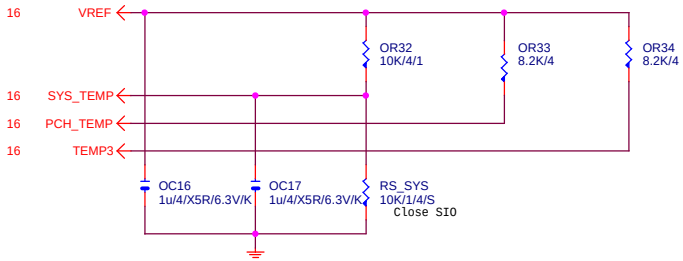


USB POWER PROTECT

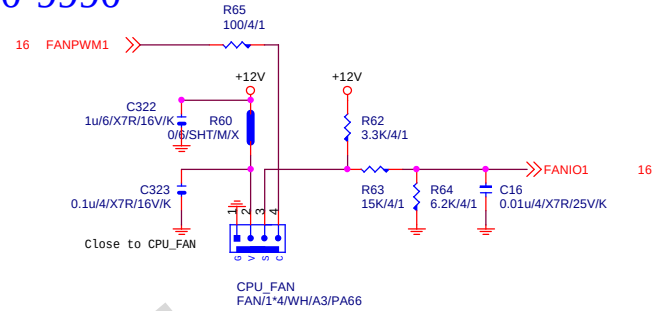


Gigabyte Technology			
Title: COM,-RI,KB_USB,USB_ESATA,-PROCHOT			
Size: Custom	Document Number: GA-H81M-S		Rev: 1.0
Date: Wednesday, June 04, 2014	Sheet 17 of 29		

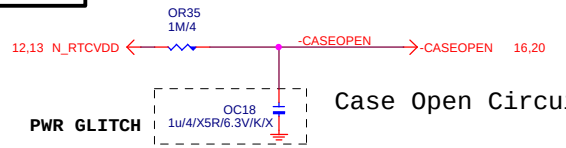
TEMP H/W MONITOR



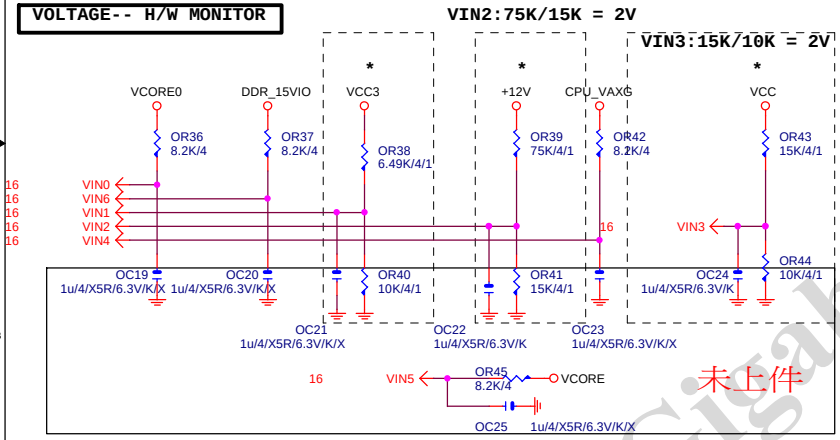
CPU SMART FAN



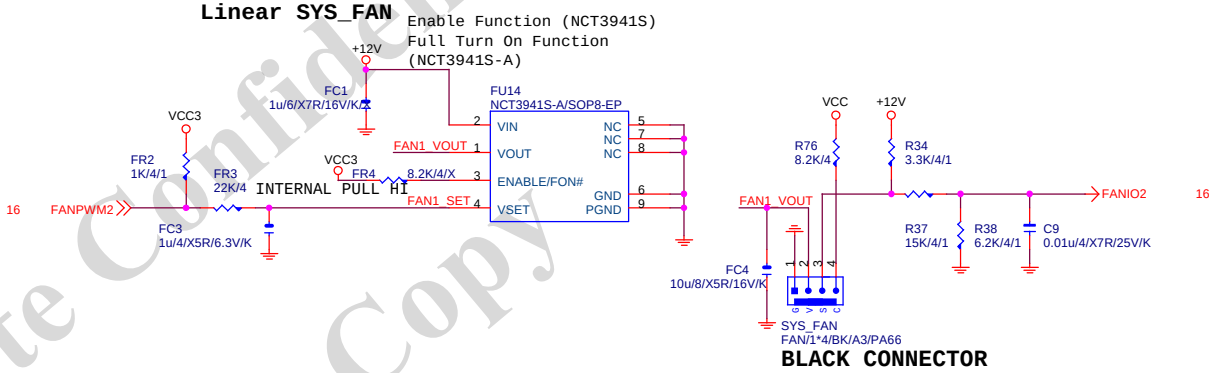
CASE OPEN



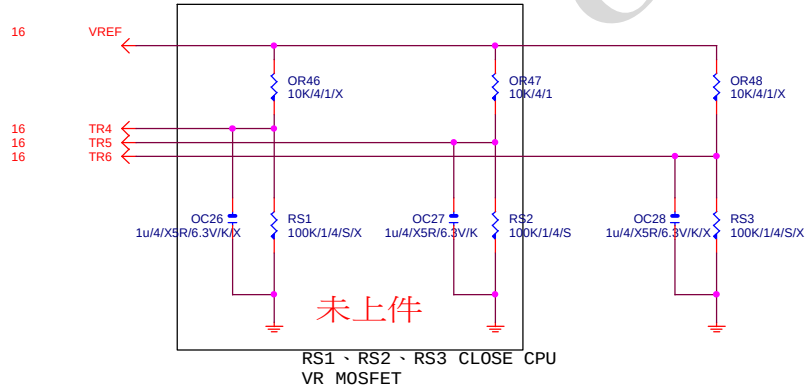
VOLTAGE-- H/W MONITOR



SYS SMART FAN

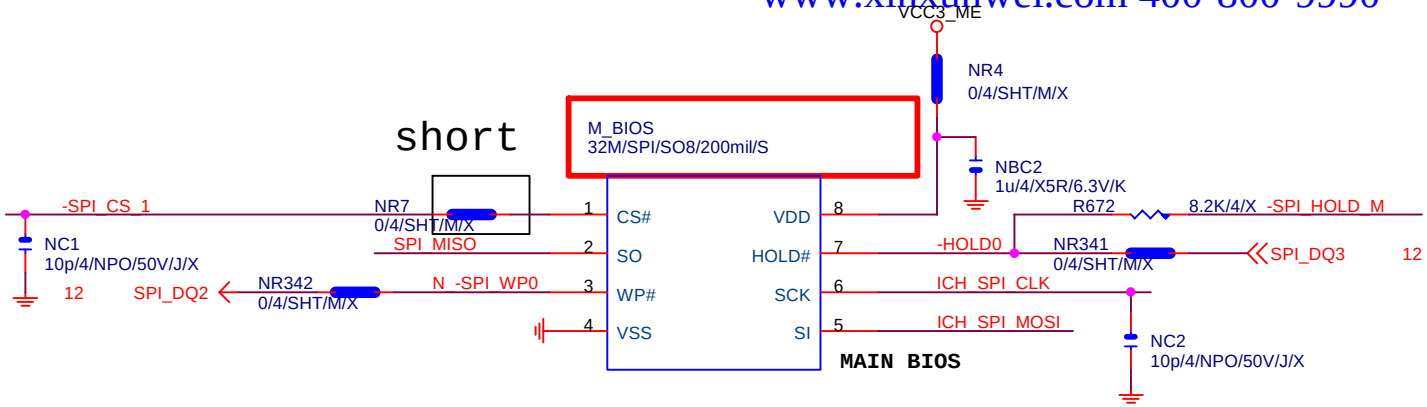


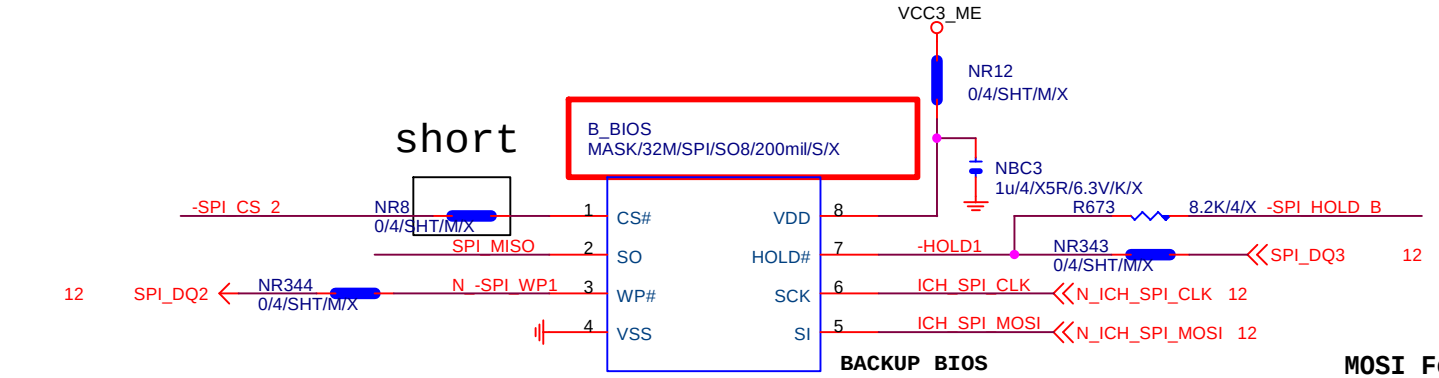
-PROHOT



RS1、RS2、RS3 CLOSE CPU
VR MOSFET

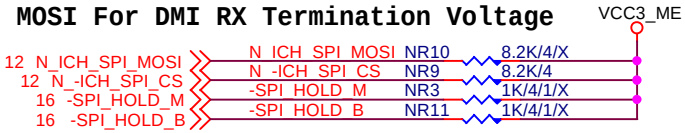
Gigabyte Technology		
Title: HWM,FAN CTRL,OV		
Size: Custom	Document Number: GA-H81M-S	Rev: 1.0
Date: Wednesday, June 04, 2014	Sheet 18 of 29	

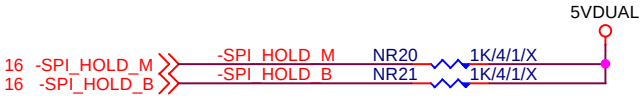


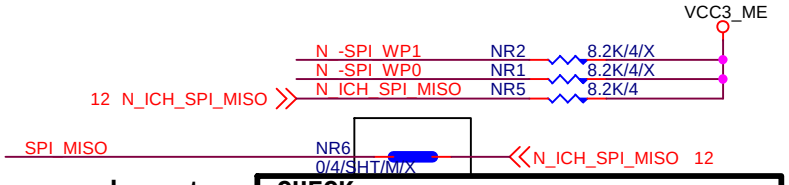


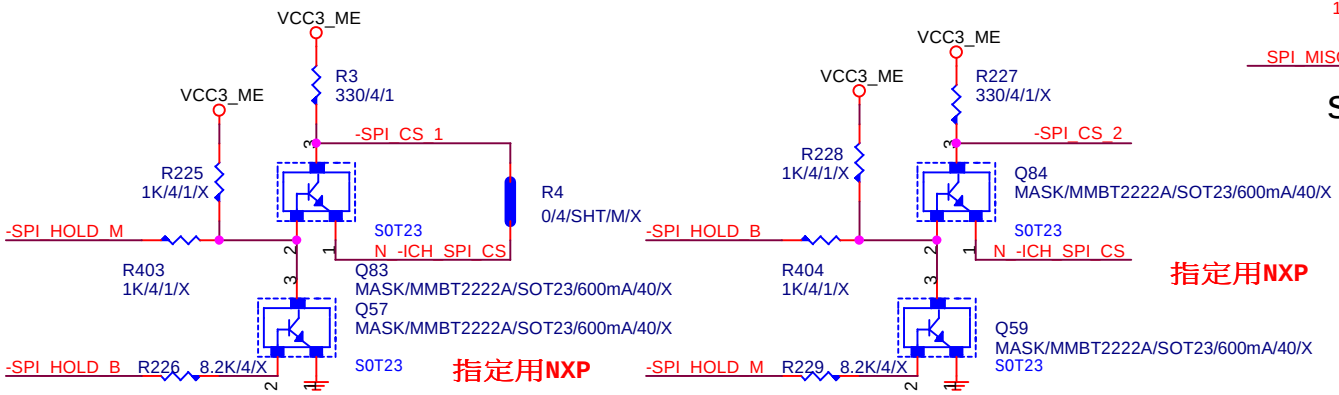
BOOT DEVICE	GNT0	GNT1
LPC	0	0
PCI	0	1
NAND	1	0
SPI	1	1

1 means floating
0 means PD 1K









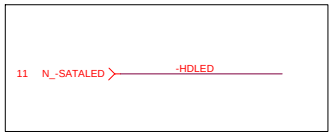
Gigabyte Technology

Title: DUAL BIOS

Size: Custom | Document Number: GA-H81M-S | Rev: 1.0

Date: Wednesday, June 04, 2014 | Sheet 19 of 29

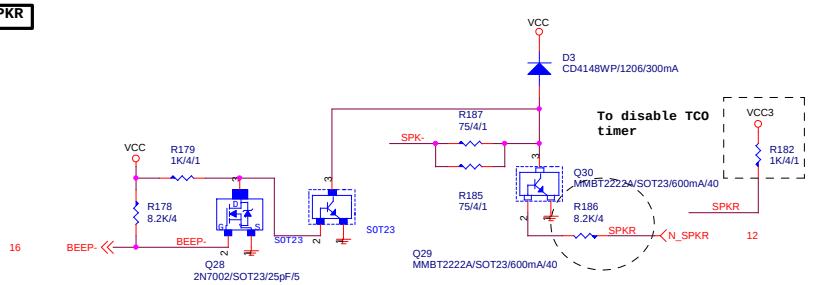
SATA LED



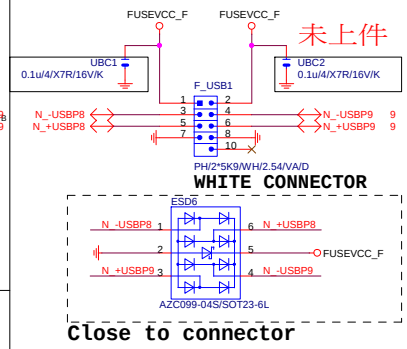
新增

-USBOC_F

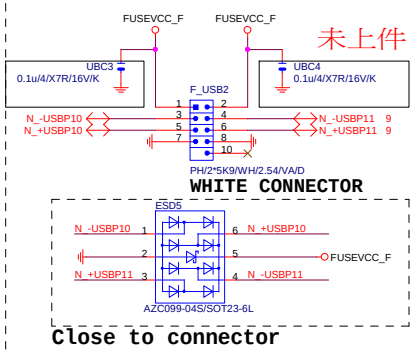
SPKR

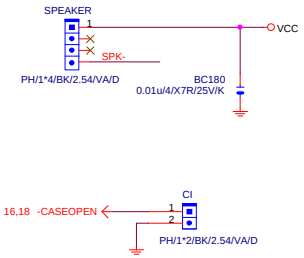


FRONT USB1

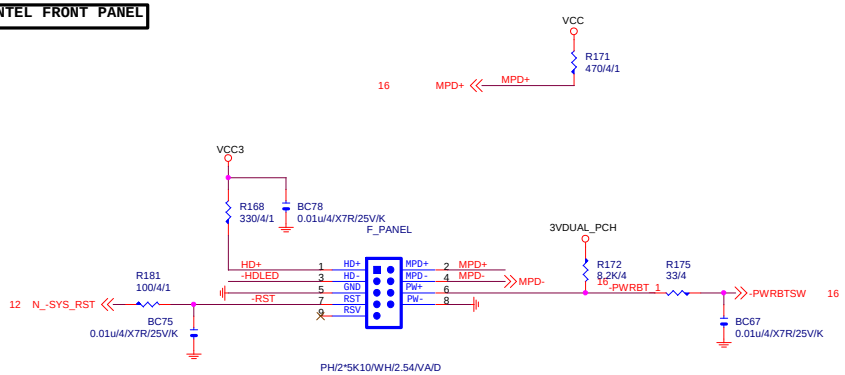


FRONT USB2

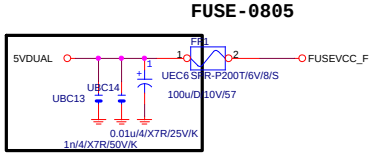




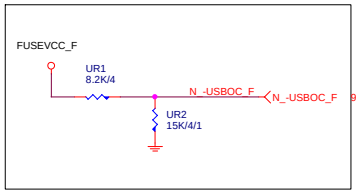
INTEL FRONT PANEL



FUSE-0805

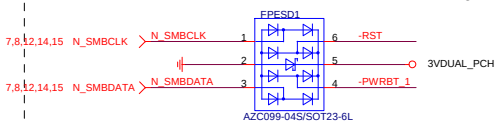


F_USB1, F_USB2 4-Port 2.6A



刪UD8，原UR1 5VDUAL改接FUSEVCC_F

PIN2X10PANEL_NEW



Gigabyte Technology		
Title: FP,F_USB,USB PWR,SPKR,SATA LED		
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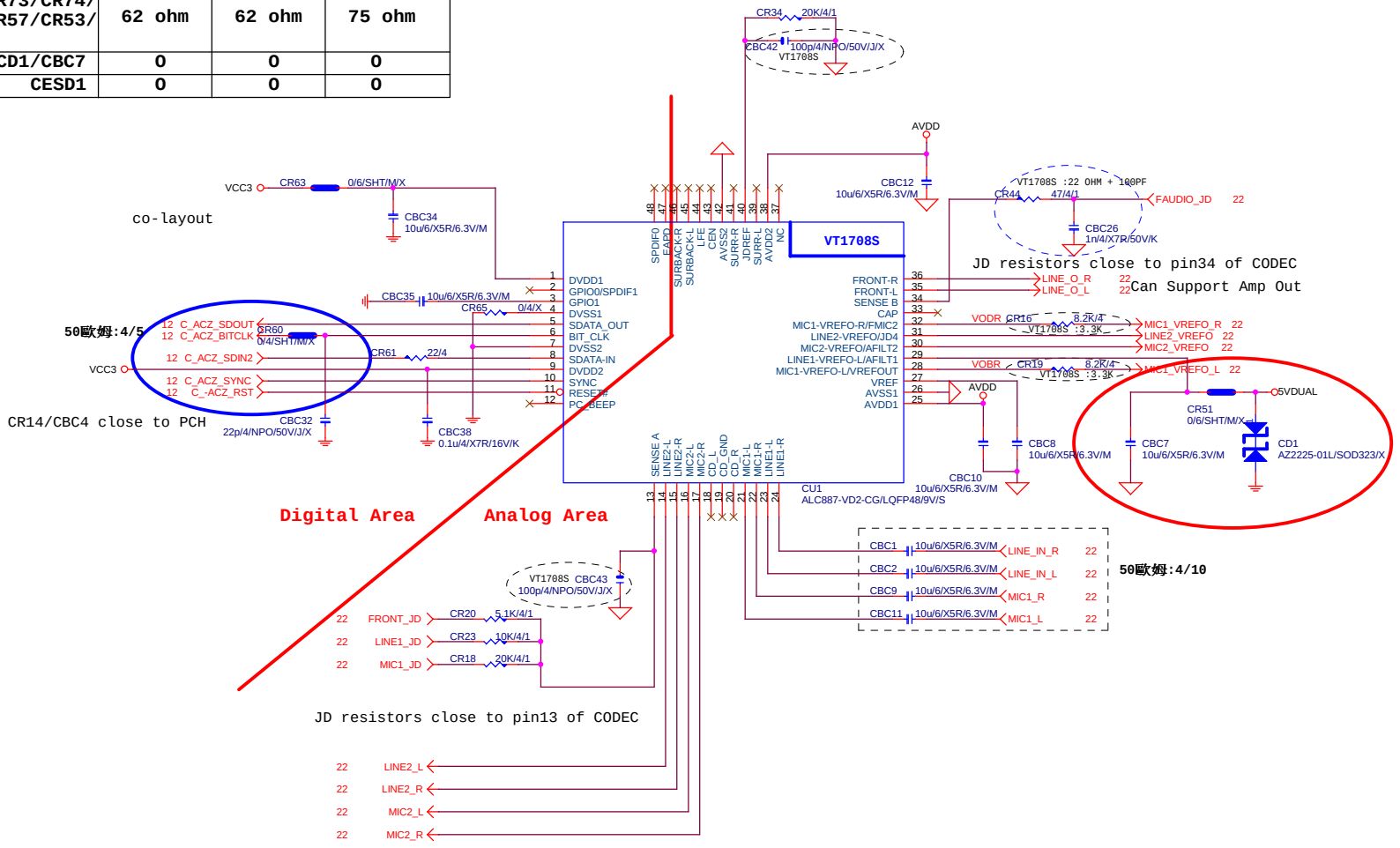
AZALIA CODEC ***ALC892/ALC887-VD2/VT1708-CE Colay***

	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-S
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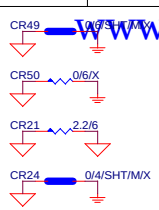
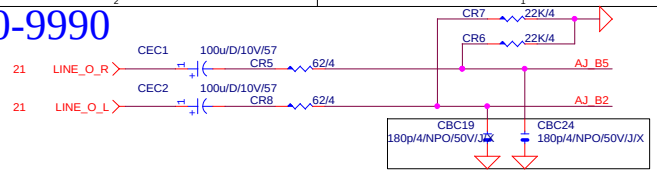
Date: Wednesday, June 04, 2014	Sheet 21 of 29

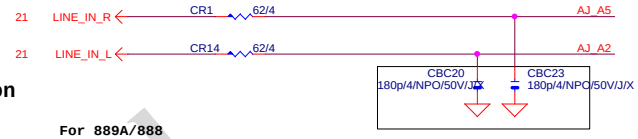


LINE_OUT



Only reserved for ALC888

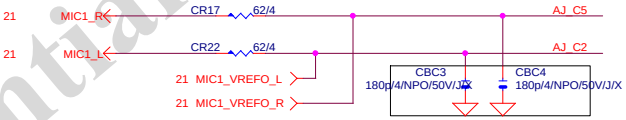
LINE-IN



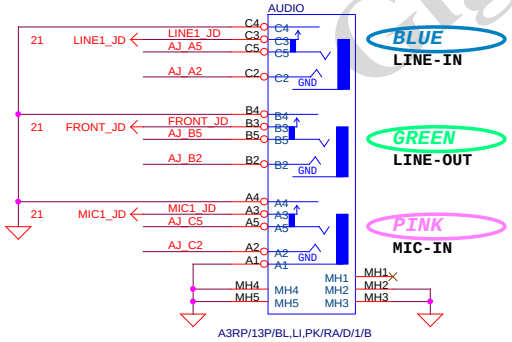
Verify MIC function in LINE-in

For 889A/888

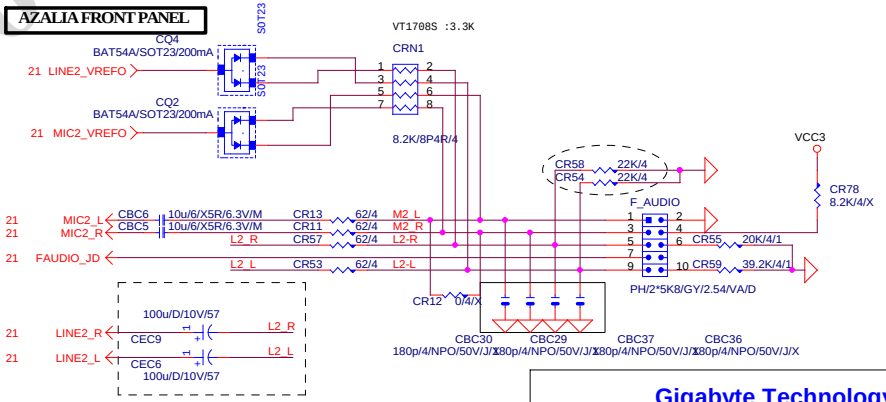
MIC-IN



SPDIF_OUT



AZALIA FRONT PANEL



Gigabyte Technology		
Title	AUDIO JACK	
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LAN:RTL8111G

LAX1
25M/16p/30ppm/49US/20/D
LA_XTALI
LA_XTALO
LAC5 20p/4/NPO/50V/J
LAC6 20p/4/NPO/50V/J

LAR12 2.49K/4/1

LAU1
RTL8111G-CG/QFN32
RTL8111G(S)/8106E

LA_MDI0+ LA_MDI0- LA_DVDD10 LA_MDI1+ LA_MDI1- LA_MDI2+ LA_MDI2- LA_DVDD10
MDIP0 MDIN0 AVDD10(NC) MDIP1 MDIN1 MDIP2(NC) MDIN2(NC) AVDD10
REGOUT(NC) VDDREG(VDD33) DVDD10(NC) LANWAKEB ISOLATEB PERSTB HSON HSOP
LA_REGOUT LA_VDD33 LA_DVDD10 N_-PCIE_WAKE N_ISOLATEB -PFMRST2 LA_ML_IN_C LA_ML_IP_C
LAC4 0.1u/4/X7R/16V/K LAC1 0.1u/4/X7R/16V/K
LA_ML_IN LA_ML_IP
LAR9 0/6/SHT/M/X
LA_VDD33
N_-PCIE_WAKE 12,14,15
-PFMRST2 16
9 9

VCC3
LAR4 1K/4/1
LAR5 15K/4/1/X
LABC4 100p/4/NPO/50V/J/X

SRCCLK-->50歐姆:[18/4/10/4/18]

LA_MDI3+ LA_MDI3- LA_VDD33 LA_ML_OP_C LA_ML_ON_C
LAR1 8.2K/4/X
VCC3
LAC3 0.1u/4/X7R/16V/K
LAC2 0.1u/4/X7R/16V/K
LA_ML_OP
LA_ML_ON
LA_SRCCLK_LAN
LA_-SRCCLK_LAN
離IC近越好

LA_ ML-->80歐姆:[15/5/5/5/15]

MDI ESD預留28KV *

LAESD2
AZC099-04S/SOT23-6L
LA_MDI0+ LA_MDI0- LA_MDI1- LA_MDI1+ 5VDUAL

LAESD3
AZC099-04S/SOT23-6L
LA_MDI2+ LA_MDI2- LA_MDI3- LA_MDI3+

LAN POWER

LA_DVDD10

(CLOSE LAU1 PIN22,30,3,8)
PIN22 LABC2 1u/4/X5R/6.3V/K
PIN30 LABC9 0.1u/4/X7R/16V/K
PIN3 LABC3 0.1u/4/X7R/16V/K
PIN8 LABC8 0.1u/4/X7R/16V/K
LABC2:1U CLOSE PIN22[REALTEK REQ]

3VDUAL
AVDD33_REG
PIN23 LABC6 0.1u/4/X7R/16V/K
(CLOSE LAU1 PIN23)

LA_VDD33
(CLOSE LAU1 PIN:11,32)
PIN11 LABC18 0.1u/4/X7R/16V/K LABC27 4.7u/6/X5R/6.3V/K
PIN32 LABC14 0.1u/4/X7R/16V/K LABC20 4.7u/6/X5R/6.3V/K
PWR SURGE
PWR SURGE
LABC18,27:CLOSE PIN11[REALTEK SURGE]
LABC14,20:CLOSE PIN32[REALTEK SURGE]

LA_DVDD10
LA_REGOUT PIN24 LABC5 0.1u/4/X7R/16V/K
LAR8 0/6/SHT/M/X LA_DVDD10
(CLOSE LAU1 PIN24)

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

USB_LAN CONNECTOR

RMA ESD PROTECT
N_+USBP3 N_-USBP3 N_-USBP2 N_+USBP2 FUSEVCC_R
UBESD3
AZC099-04S/SOT23-6L
*

使用RU9 USB_LAN可省略LAESD1保護LED

LABC22 0.01u/4/X7R/25V/K/X
USB_LAN
USB+LAN/1G/GO,Y/OS/RA/D/12C/ES/[11NR6-702009-96R]
LA_MDI0+ LA_MDI0- LA_MDI1+ LA_MDI1- LA_MDI2+ LA_MDI2- LA_MDI3+ LA_MDI3-
LABC25 0/4/SHT/M/X
UP
DOWN
D1 LA_LED_ACT_TXRX
D2 LA_LED_D2 LAR13 150/6 LAN_3VDUAL_LED
D3 LA_LED_LINK100
D4 LA_LED_LINK1000
3VDUAL
LAFB2 0/6/SHT/M/X
LABC24 0.1u/4/X7R/16V/K/X
LABC7 0.1u/4/X7R/16V/K/X
LABC23 0.1u/4/X7R/16V/K/X
FUSEVCC_R
N_-USBP2 N_+USBP2 N_-USBP3 N_+USBP3
N/A

LA_MDI-->100歐姆:[20/4/8/4/20]

EMI SHORT PAD

PS:視EMI需求
LAR24 0/6/SHT/M/X

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

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

U4 U3 U2 U1 U8 U7 U6 U5 (-,+)
L1 L3 L5 L7 L9 L2 L4 L6 L8 L10 D1 D2 D3 D4
YELLOW ORANGE GREEN
(+,-)

Dual Color LED
D4 D3 Green
D4 D3 Orange

Single Color LED
D2 D1 Yellow

Gigabyte Technology
Title: DISCRETE POWER
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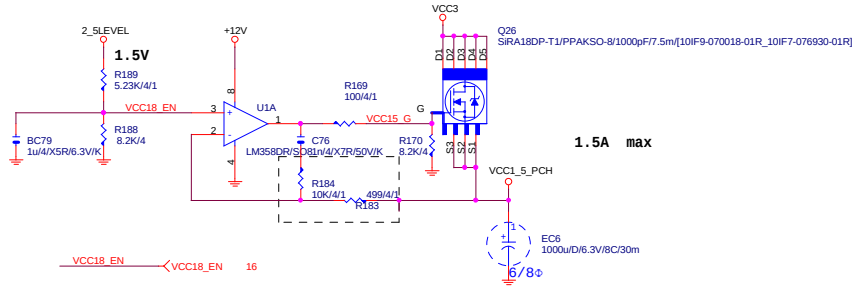
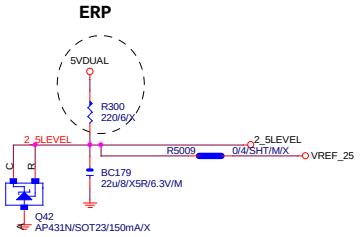
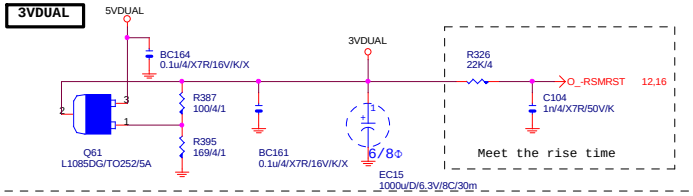
VCC1_8_PCH



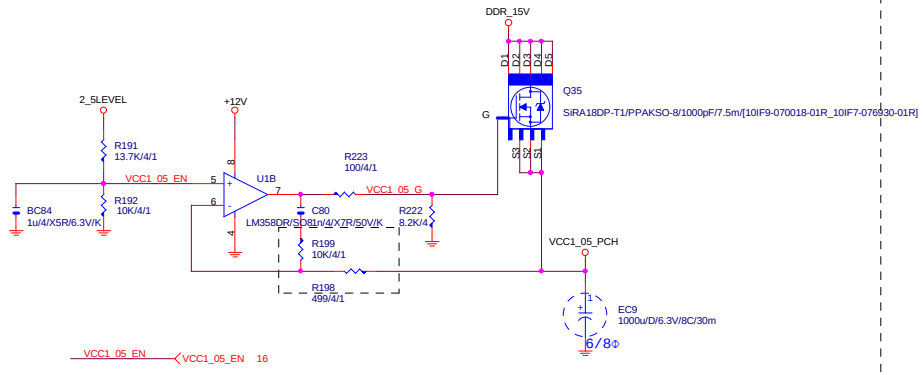
2_5LEVEL

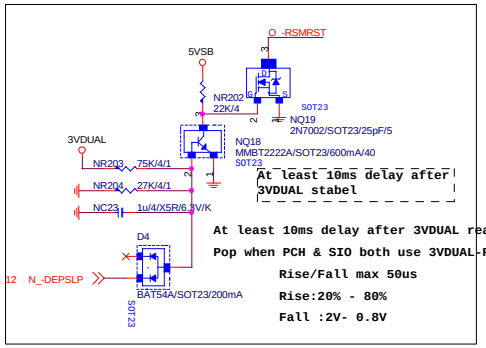


3VDUAL

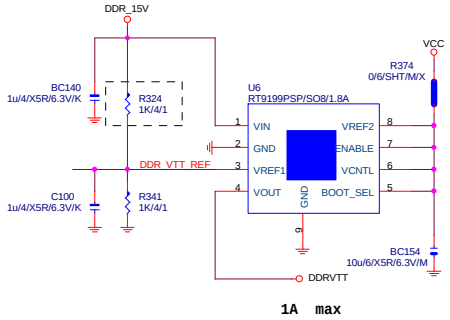


VCC1_05_PCH

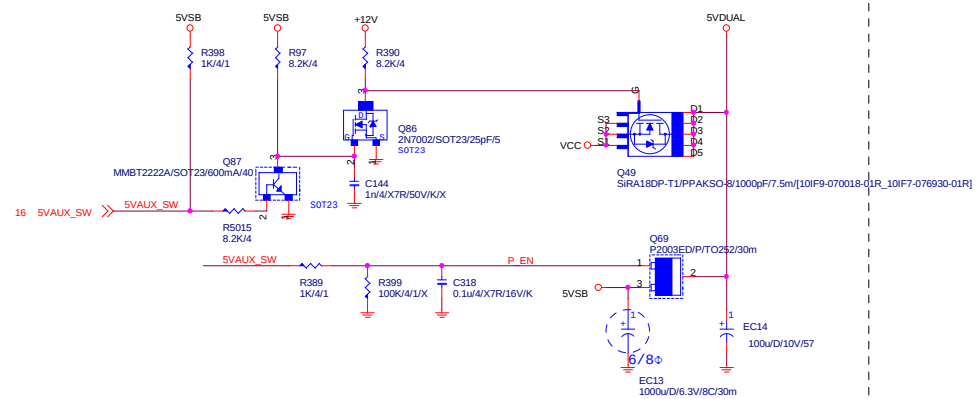




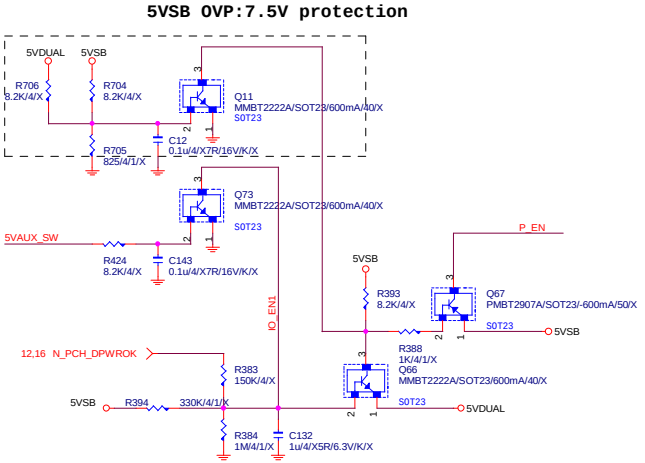
DDRVTT



5VDUAL



5VDUAL SHORT PROTECT



Gigabyte Technology		
Title: DISCRETE POWER		
Size: Custom	Document Number: GA-H81M-S	Rev: 1.0
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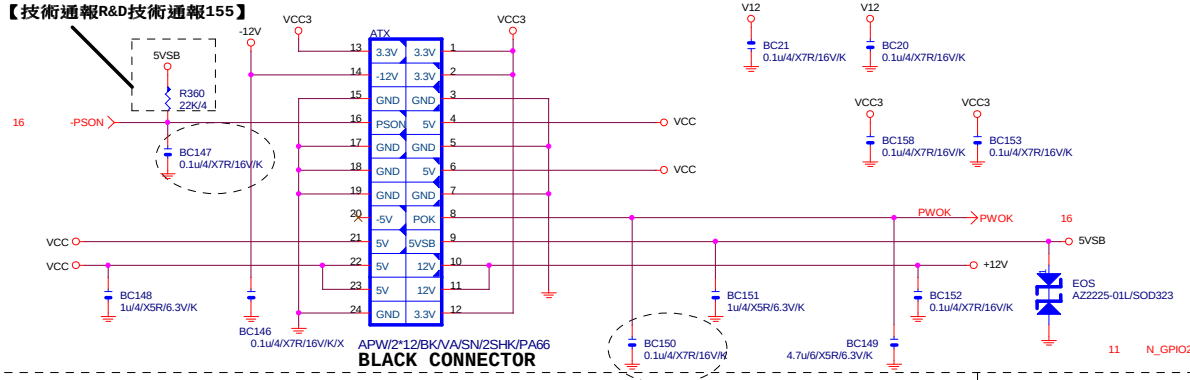
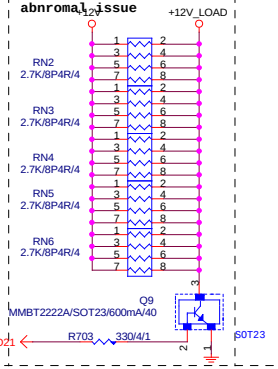
ATXX24 POWER CONNECTOR

【技術通報R&D技術通報155】

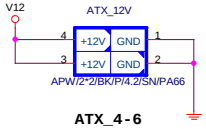


【技術通報R&D技術通報158】

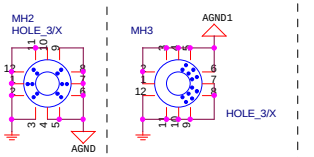
To fix 12V light load abnroma l issue

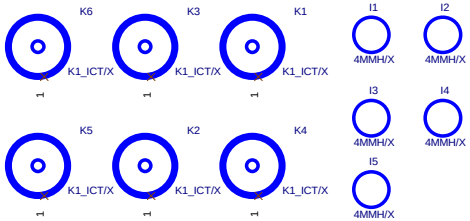


ATXX4 POWER CONNECTOR



ATX_4-6

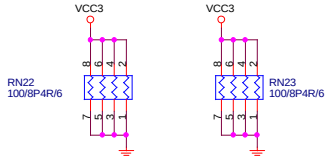




To prevent the 5VSB under loading when boot

PWOK PATCH

【技術通報R&D技術通報154】



FIX PWR MINMUN LOAD

Gigabyte Technology

Title	ATX CONNECTOR	
Size: Custom	Document Number: GA-H81M-S	Rev: 1.0
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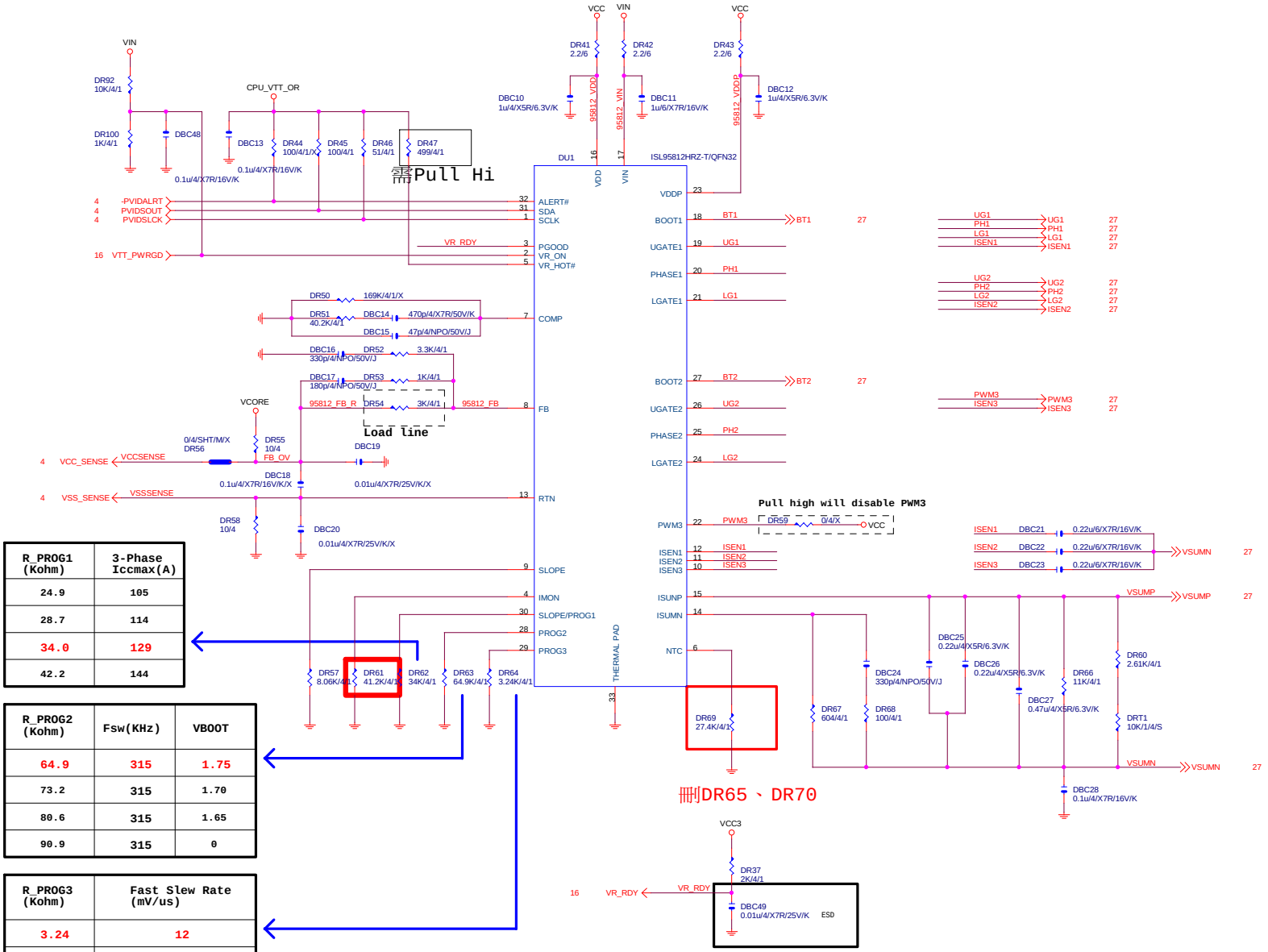

R_PROG1 (Kohm)	3-Phase Iccmax(A)
24.9	105
28.7	114
34.0	129
42.2	144

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

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

Gigabyte Technology			
Title: CPU CORE VR-1			
Size: Custom	Document Number: GA-H81M-S		Rev: 1.0
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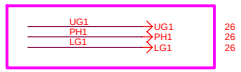
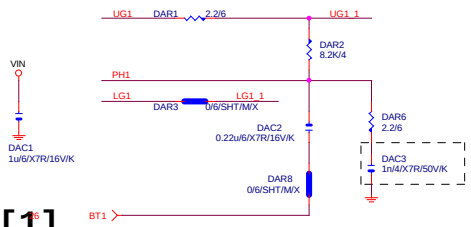
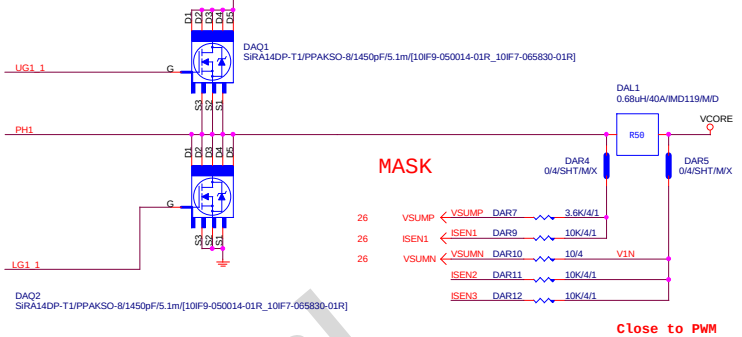
PHASE 1

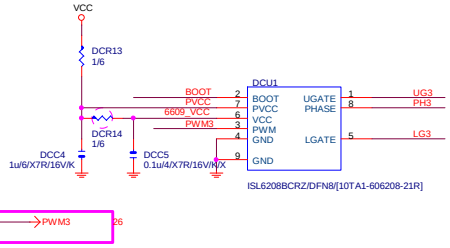


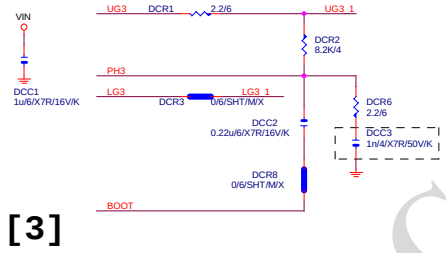


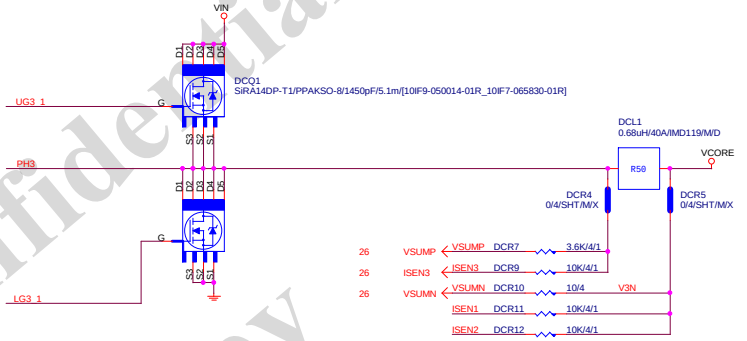


Close to PWM

PHASE 3

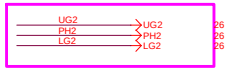


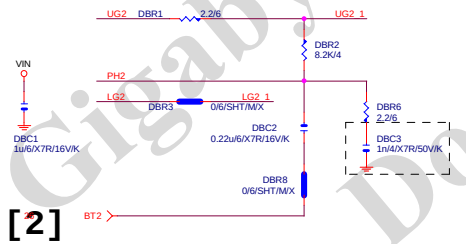


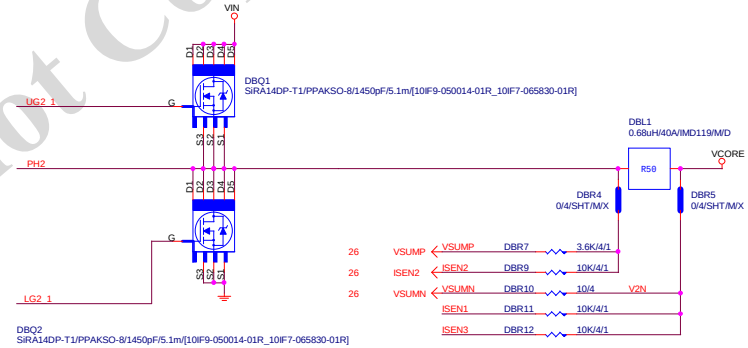


Close to PWM

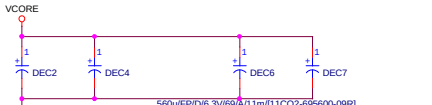
PHASE 2

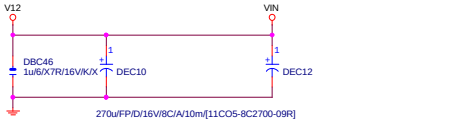






Close to PWM





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Title: CPU CORE VR-2			
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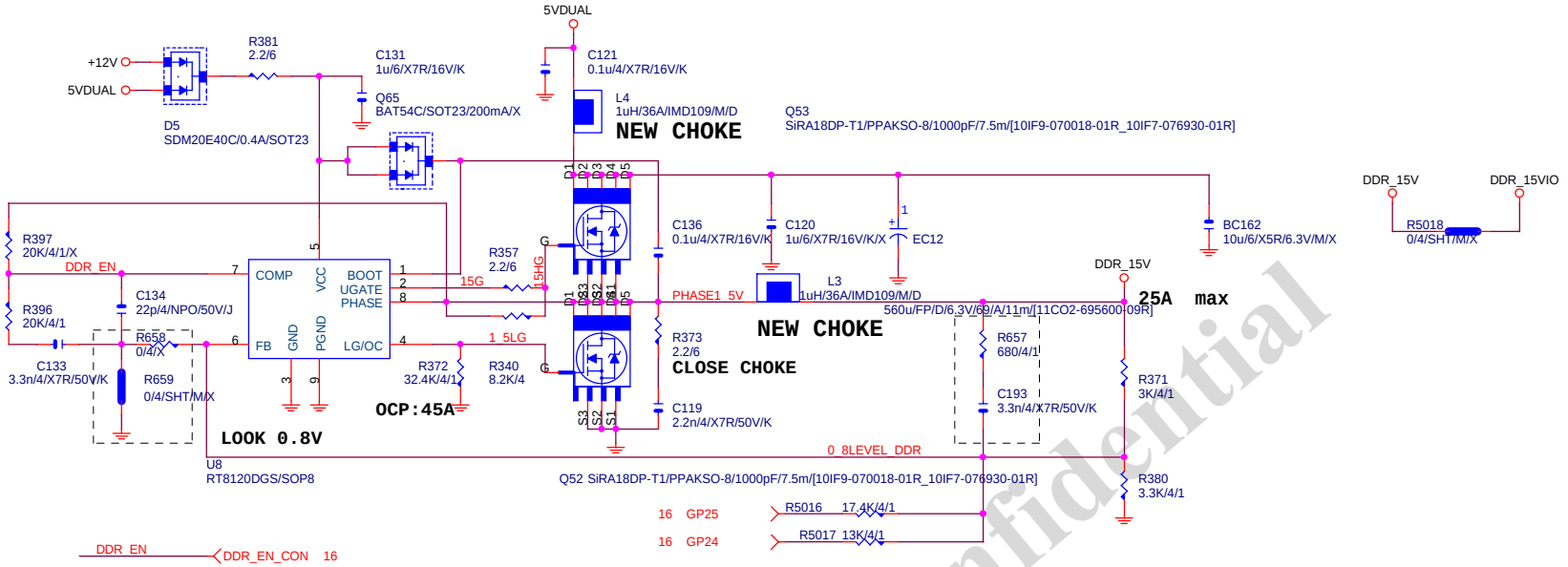
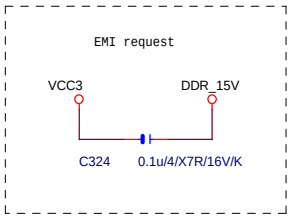
DDR15V





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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			
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