Model Name: GA-H81M-H

Revision 2.01

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 RTL8111G
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: 2.01

Date: Friday, July 04, 2014 | 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
2014/05/12	1. H81 series 第1+2波cost down 2. LAN change to RTL8111G	9MH81MH-00-20A
2014/06/23	1. SATA MLCC change to short pad	9MH81MH-00-20B

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
2014/05/12	1. H81 series 第1+2波cost down 2. LAN change to RTL8111G	Rev 2.0
2014/06/23	1. SATA MLCC change to short pad	Rev 2.01

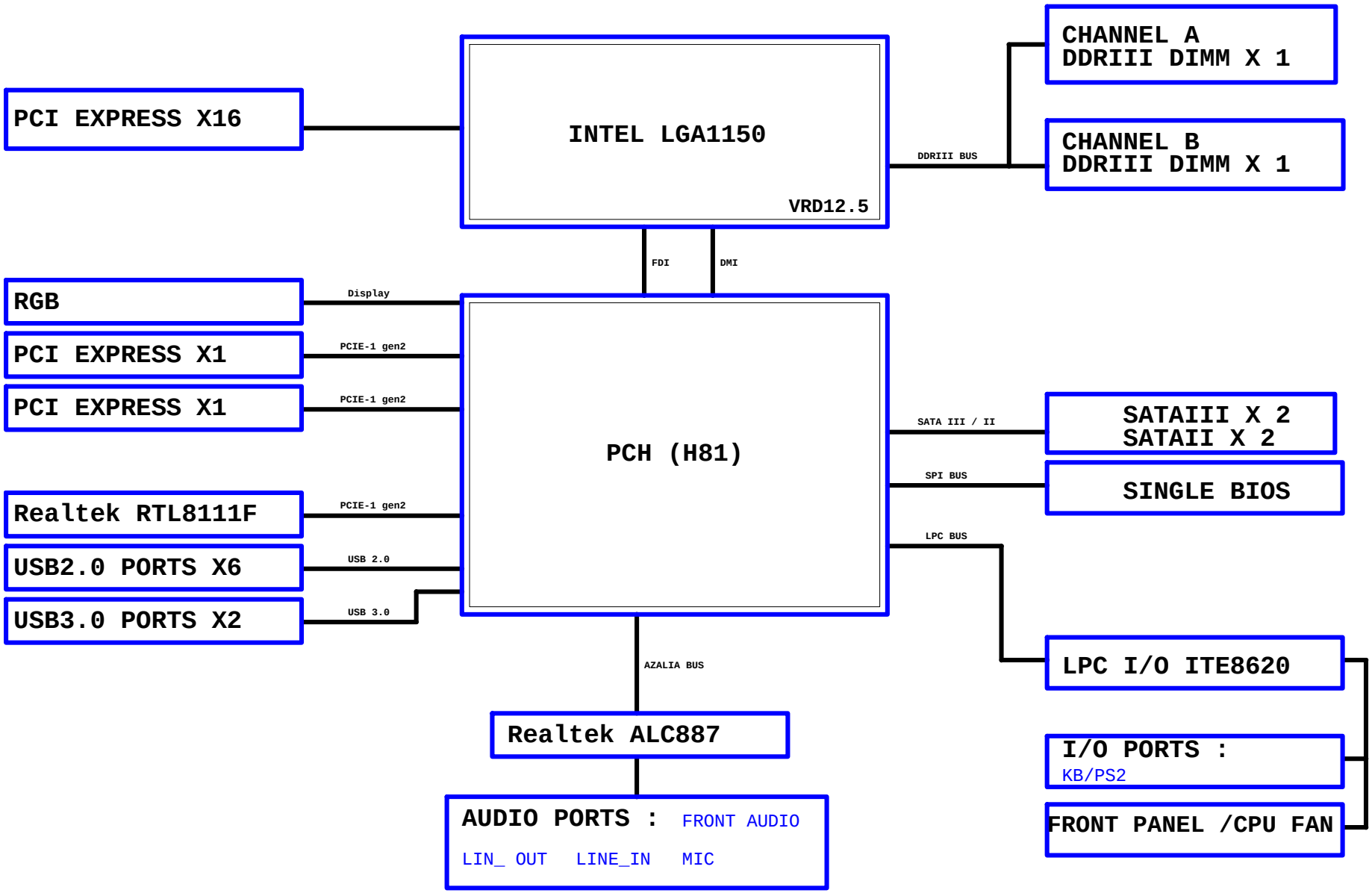
Gigabyte Technology

Title: BOM & PCB MODIFY HISTORY

Size: Custom | Document Number: GA-H81M-H | Rev: 2.01

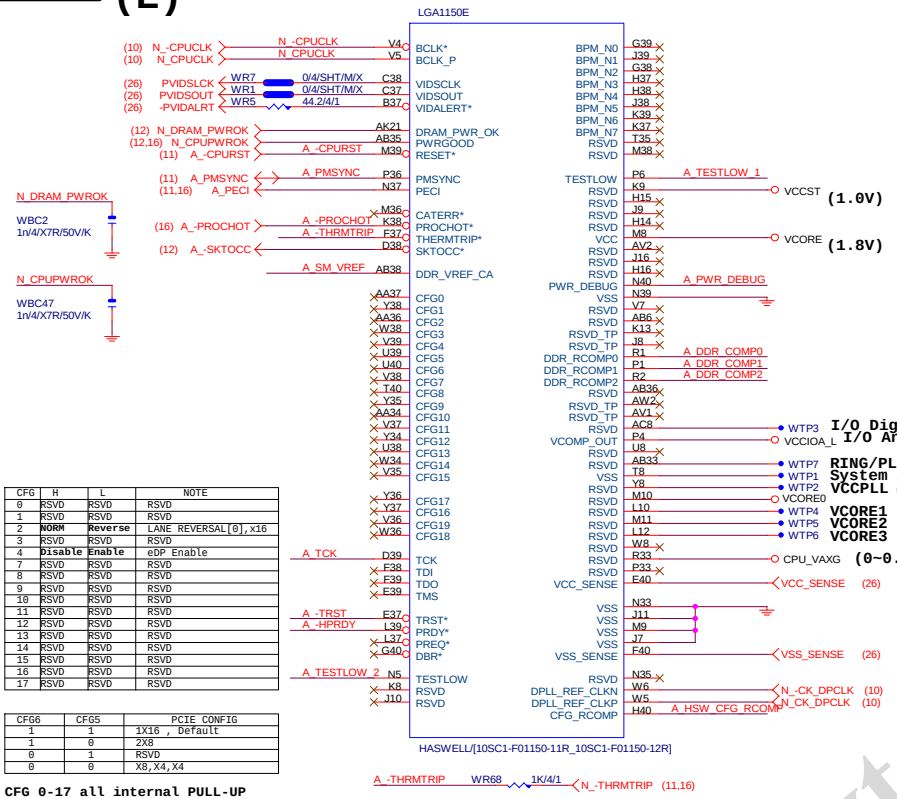
Date: Friday, July 04, 2014 | Sheet 2 of 29

BLOCK DIAGRAM



Gigabyte Technology		
Title: BLOCK DIAGRAM		
Size: C	Document Number: GA-H81M-H	Rev: 2.01
Date: Friday, July 04, 2014	Sheet 3 of 29	

LGA1150 (E)

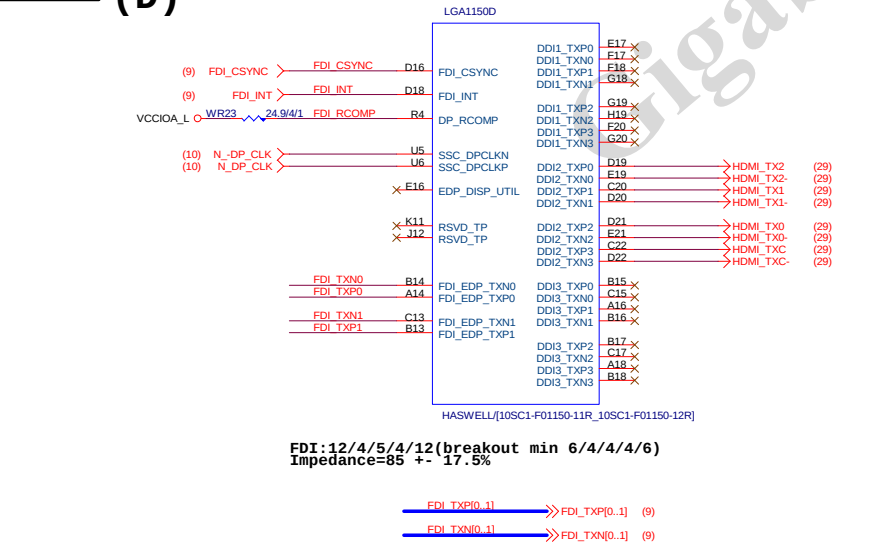


CFG	H	L	NOTE
0	RSVD	RSVD	RSVD
1	RSVD	RSVD	RSVD
2	**NORM**	**Reverse**	LANE REVERSAL[0],x16
3	RSVD	RSVD	RSVD
4	**Disable**	**Enable**	eDP Enable
7	RSVD	RSVD	RSVD
8	RSVD	RSVD	RSVD
9	RSVD	RSVD	RSVD
10	RSVD	RSVD	RSVD
11	RSVD	RSVD	RSVD
12	RSVD	RSVD	RSVD
13	RSVD	RSVD	RSVD
14	RSVD	RSVD	RSVD
15	RSVD	RSVD	RSVD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

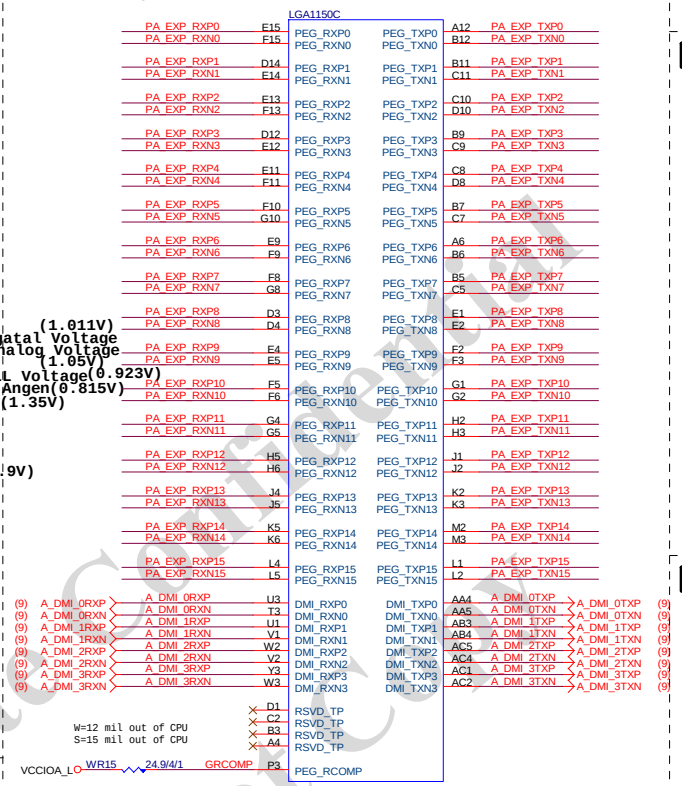
LGA1150 (D)



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%

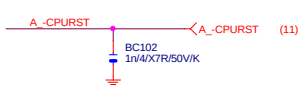


DMI:12/4/4/4/12(breakout min 8/4/4/4/8)
Impedance=85 +- 17.5%

PA_EXP_TXP[0..15] 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)

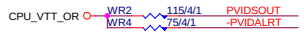
-CPURST

1.1V分壓

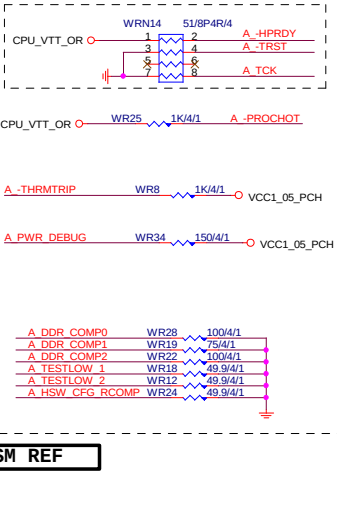


For IT8620 Ctrl

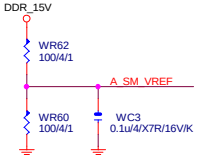
CPU SVID



CPU PU/PD



SM REF



Gigabyte Technology

Title	CPU LGA1150-A	
Size: Custom	Document Number: GA-H81M-H	Rev: 2.01
Date: Friday, July 04, 2014	Sheet 4 of 29	

LGA1150 (A)

LGA1150A

MAAA0 AU13 DDR0_MA0
MAAA1 AV16 DDR0_MA1
MAAA2 AU16 DDR0_MA2
MAAA3 AW17 DDR0_MA3
MAAA4 AU17 DDR0_MA4
MAAA5 AW18 DDR0_MA5
MAAA6 AV17 DDR0_MA6
MAAA7 AT18 DDR0_MA7
MAAA8 AU18 DDR0_MA8
MAAA9 AT19 DDR0_MA9
MAAA10 AW11 DDR0_MA10
MAAA11 AV19 DDR0_MA11
MAAA12 AU19 DDR0_MA12
MAAA13 AY10 DDR0_MA13
MAAA14 AT20 DDR0_MA14
MAAA15 AU21 DDR0_MA15

MODT_A0 AW10 DDR0_ODT0
MODT_A1 AY8 DDR0_ODT1
AW9 DDR0_ODT2
AU8 DDR0_ODT3

AW33 DDR0_ECC0
AV33 DDR0_ECC1
AU31 DDR0_ECC2
AV31 DDR0_ECC3
AT33 DDR0_ECC4
AU33 DDR0_ECC5
AT31 DDR0_ECC6
AW31 DDR0_ECC7

(7) SBAA0 SBAA0 AV12 DDR0_BA0
(7) SBAA1 SBAA1 AY11 DDR0_BA1
(7) SBAA2 SBAA2 AT21 DDR0_BA2

(7) CKEA0 CKEA0 AV22 DDR0_CKE0
(7) CKEA1 CKEA1 AT23 DDR0_CKE1
AU22 DDR0_CKE2
AU23 DDR0_CKE3

(7) -CSA0 -CSA0 AU14 DDR0_CS_N0
(7) -CSA1 -CSA1 AV9 DDR0_CS_N1
AU10 DDR0_CS_N2
AW8 DDR0_CS_N3

(7) DCLKA0 DCLKA0 AY15 DDR0_CLK_P0
(7) -DCLKA0 -DCLKA0 AY16 DDR0_CLK_N0
(7) DCLKA1 DCLKA1 AW15 DDR0_CLK_P1
(7) -DCLKA1 -DCLKA1 AV15 DDR0_CLK_N1
AV14 DDR0_CLK_P2
AW14 DDR0_CLK_N2
AW13 DDR0_CLK_P3
AY13 DDR0_CLK_N3

AW12 RSVD

(7) -SRASA -SRASA AU12 DDR0_RAS*
(7) -SWEA -SWEA AU11 DDR0_WE*
AV20 RSVD
AW27 RSVD
(7) -SCASA -SCASA AU9 DDR0_CAS*
(7,8) -DDR3_RST WR61 0/4/SHT/M/X AK22 DDR_RESET*
WC4 0.1u/4/X7R/16V/K/X

DDR0_DQ0 AD38 MDA0
DDR0_DQ1 AD39 MDA1
DDR0_DQ2 AF38 MDA2
DDR0_DQ3 AF39 MDA3
DDR0_DQ4 AD37 MDA4
DDR0_DQ5 AD40 MDA5
DDR0_DQ6 AE37 MDA6
DDR0_DQ7 AF40 MDA7
DDR0_DQ8 AH40 MDA8
DDR0_DQ9 AH39 MDA13
DDR0_DQ10 AK38 MDA10
DDR0_DQ11 AK39 MDA11
DDR0_DQ12 AH37 MDA12
DDR0_DQ13 AH38 MDA9
DDR0_DQ14 AK37 MDA14
DDR0_DQ15 AK40 MDA15
DDR0_DQ16 AM40 MDA17
DDR0_DQ17 AM39 MDA21
DDR0_DQ18 AP38 MDA18
DDR0_DQ19 AP39 MDA19
DDR0_DQ20 AM37 MDA20
DDR0_DQ21 AM38 MDA16
DDR0_DQ22 AP37 MDA22
DDR0_DQ23 AP40 MDA23
DDR0_DQ24 AV37 MDA25
DDR0_DQ25 AW37 MDA29
DDR0_DQ26 AU35 MDA26
DDR0_DQ27 AV35 MDA27
DDR0_DQ28 AT37 MDA28
DDR0_DQ29 AU37 MDA24
DDR0_DQ30 AT35 MDA30
DDR0_DQ31 AW35 MDA31
DDR0_DQ32 AY6 MDA33
DDR0_DQ33 AU6 MDA37
DDR0_DQ34 AV4 MDA34
DDR0_DQ35 AU4 MDA35
DDR0_DQ36 AW6 MDA36
DDR0_DQ37 AV6 MDA32
DDR0_DQ38 AW4 MDA38
DDR0_DQ39 AY4 MDA39
DDR0_DQ40 AR1 MDA41
DDR0_DQ41 AR4 MDA45
DDR0_DQ42 AN3 MDA42
DDR0_DQ43 AN4 MDA43
DDR0_DQ44 AR2 MDA44
DDR0_DQ45 AR3 MDA40
DDR0_DQ46 AN2 MDA46
DDR0_DQ47 AN1 MDA47
DDR0_DQ48 AL1 MDA49
DDR0_DQ49 AL4 MDA53
DDR0_DQ50 AJ3 MDA50
DDR0_DQ51 AJ4 MDA51
DDR0_DQ52 AL2 MDA52
DDR0_DQ53 AL3 MDA48
DDR0_DQ54 AJ2 MDA54
DDR0_DQ55 AJ1 MDA55
DDR0_DQ56 AG1 MDA57
DDR0_DQ57 AG4 MDA61
DDR0_DQ58 AE3 MDA58
DDR0_DQ59 AE4 MDA59
DDR0_DQ60 AG2 MDA60
DDR0_DQ61 AG3 MDA56
DDR0_DQ62 AE2 MDA62
DDR0_DQ63 AE1 MDA63
DDR0_DQS_P0 AE39 DQSA0
DDR0_DQS_P1 AJ39 DQSA1
DDR0_DQS_P2 AN39 DQSA2
DDR0_DQS_P3 AV36 DQSA3
DDR0_DQS_P4 AV5 DQSA4
DDR0_DQS_P5 AP3 DQSA5
DDR0_DQS_P6 AK3 DQSA6
DDR0_DQS_P7 AE3 DQSA7
DDR0_DQS_P8 AV32
DDR0_DQS_N0 AE38 -DQSA0
DDR0_DQS_N1 AJ38 -DQSA1
DDR0_DQS_N2 AN38 -DQSA2
DDR0_DQS_N3 AU36 -DQSA3
DDR0_DQS_N4 AW5 -DQSA4
DDR0_DQS_N5 AP2 -DQSA5
DDR0_DQS_N6 AK2 -DQSA6
DDR0_DQS_N7 AF2 -DQSA7
DDR0_DQS_N8 AU32

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

LGA1150 (B)

LGA1150B

MAAB0 AL19 DDR1_MA0
MAAB1 AK23 DDR1_MA1
MAAB2 AM22 DDR1_MA2
MAAB3 AM23 DDR1_MA3
MAAB4 AP23 DDR1_MA4
MAAB5 AL23 DDR1_MA5
MAAB6 AY24 DDR1_MA6
MAAB7 AV25 DDR1_MA7
MAAB8 AU26 DDR1_MA8
MAAB9 AW25 DDR1_MA9
MAAB10 AP18 DDR1_MA10
MAAB11 AY25 DDR1_MA11
MAAB12 AV26 DDR1_MA12
MAAB13 AR15 DDR1_MA13
MAAB14 AV27 DDR1_MA14
MAAB15 AY28 DDR1_MA15

MODT_B0 AM17 DDR1_ODT0
MODT_B1 AL16 DDR1_ODT1
AM16 DDR1_ODT2
AK15 DDR1_ODT3

AM26 DDR1_ECC0
AM25 DDR1_ECC1
AP25 DDR1_ECC2
AP26 DDR1_ECC3
AL26 DDR1_ECC4
AL25 DDR1_ECC5
AR26 DDR1_ECC6
AR25 DDR1_ECC7

(8) SBAB0 SBAB0 AK17 DDR1_BA0
(8) SBAB1 SBAB1 AL18 DDR1_BA1
(8) SBAB2 SBAB2 AW28 DDR1_BA2

(8) CKEB0 CKEB0 AW29 DDR1_CKE0
(8) CKEB1 CKEB1 AY29 DDR1_CKE1
AU28 DDR1_CKE2
AU29 DDR1_CKE3

(8) -CSB0 -CSB0 AP17 DDR1_CS_N0
(8) -CSB1 -CSB1 AN15 DDR1_CS_N1
AN17 DDR1_CS_N2
AL15 DDR1_CS_N3

(8) DCLKB0 DCLKB0 AM20 DDR1_CLK_P0
(8) -DCLKB0 -DCLKB0 AM21 DDR1_CLK_N0
(8) DCLKB1 DCLKB1 AP22 DDR1_CLK_P1
(8) -DCLKB1 -DCLKB1 AP21 DDR1_CLK_N1
AN20 DDR1_CLK_P2
AN21 DDR1_CLK_N2
AP19 DDR1_CLK_P3
AP20 DDR1_CLK_N3

(8) -SCASB -SCASB AP16 DDR1_CAS*
AL20 RSVD
(8) -SRASB -SRASB AM18 DDR1_RAS*
(8) -SWEB -SWEB AK16 DDR1_WE*

(7) VREF_DQA VREF_DQA AB39 DDR_VREF_DQ0
(8) VREF_DQB VREF_DQB AB40 DDR_VREF_DQ1

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

DDR1_DQ0 AE34 MDB0
DDR1_DQ1 AE35 MDB1
DDR1_DQ2 AG35 MDB2
DDR1_DQ3 AH35 MDB3
DDR1_DQ4 AD34 MDB4
DDR1_DQ5 AD35 MDB5
DDR1_DQ6 AG34 MDB6
DDR1_DQ7 AH34 MDB7
DDR1_DQ8 AL34 MDB8
DDR1_DQ9 AL35 MDB9
DDR1_DQ10 AK31 MDB10
DDR1_DQ11 AL31 MDB11
DDR1_DQ12 AK34 MDB12
DDR1_DQ13 AK35 MDB13
DDR1_DQ14 AK32 MDB14
DDR1_DQ15 AL32 MDB15
DDR1_DQ16 AN34 MDB17
DDR1_DQ17 AP34 MDB21
DDR1_DQ18 AN31 MDB19
DDR1_DQ19 AP31 MDB23
DDR1_DQ20 AN35 MDB20
DDR1_DQ21 AP35 MDB16
DDR1_DQ22 AN32 MDB18
DDR1_DQ23 AP32 MDB22
DDR1_DQ24 AM29 MDB25
DDR1_DQ25 AM28 MDB28
DDR1_DQ26 AR29 MDB27
DDR1_DQ27 AR28 MDB30
DDR1_DQ28 AL29 MDB24
DDR1_DQ29 AL28 MDB29
DDR1_DQ30 AP29 MDB26
DDR1_DQ31 AP28 MDB31
DDR1_DQ32 AR12 MDB32
DDR1_DQ33 AP12 MDB33
DDR1_DQ34 AL13 MDB34
DDR1_DQ35 AL12 MDB35
DDR1_DQ36 AR13 MDB36
DDR1_DQ37 AP13 MDB37
DDR1_DQ38 AM13 MDB38
DDR1_DQ39 AM12 MDB39
DDR1_DQ40 AR9 MDB45
DDR1_DQ41 AP9 MDB41
DDR1_DQ42 AR6 MDB47
DDR1_DQ43 AP6 MDB43
DDR1_DQ44 AR10 MDB44
DDR1_DQ45 AP10 MDB40
DDR1_DQ46 AR7 MDB46
DDR1_DQ47 AP7 MDB42
DDR1_DQ48 AM9 MDB52
DDR1_DQ49 AL9 MDB53
DDR1_DQ50 AL6 MDB50
DDR1_DQ51 AL7 MDB55
DDR1_DQ52 AM10 MDB48
DDR1_DQ53 AL10 MDB49
DDR1_DQ54 AM6 MDB54
DDR1_DQ55 AM7 MDB51
DDR1_DQ56 AH6 MDB61
DDR1_DQ57 AH7 MDB60
DDR1_DQ58 AE6 MDB59
DDR1_DQ59 AE7 MDB63
DDR1_DQ60 AJ6 MDB56
DDR1_DQ61 AJ7 MDB57
DDR1_DQ62 AF6 MDB58
DDR1_DQ63 AF7 MDB62
DDR1_DQS_P0 AE35 DQSB0
DDR1_DQS_P1 AL33 DQSB1
DDR1_DQS_P2 AP33 DQSB2
DDR1_DQS_P3 AN28 DQSB3
DDR1_DQS_P4 AN12 DQSB4
DDR1_DQS_P5 AP8 DQSB5
DDR1_DQS_P6 AL8 DQSB6
DDR1_DQS_P7 AG7 DQSB7
DDR1_DQS_P8 AN25
DDR1_DQS_N0 AF34 -DQSB0
DDR1_DQS_N1 AK33 -DQSB1
DDR1_DQS_N2 AN33 -DQSB2
DDR1_DQS_N3 AP29 -DQSB3
DDR1_DQS_N4 AN13 -DQSB4
DDR1_DQS_N5 AR8 -DQSB5
DDR1_DQS_N6 AM8 -DQSB6
DDR1_DQS_N7 AG6 -DQSB7
DDR1_DQS_N8 AN26

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

LGA1150 (CR)

CR
CPU RETAINTION/X

LGA1150

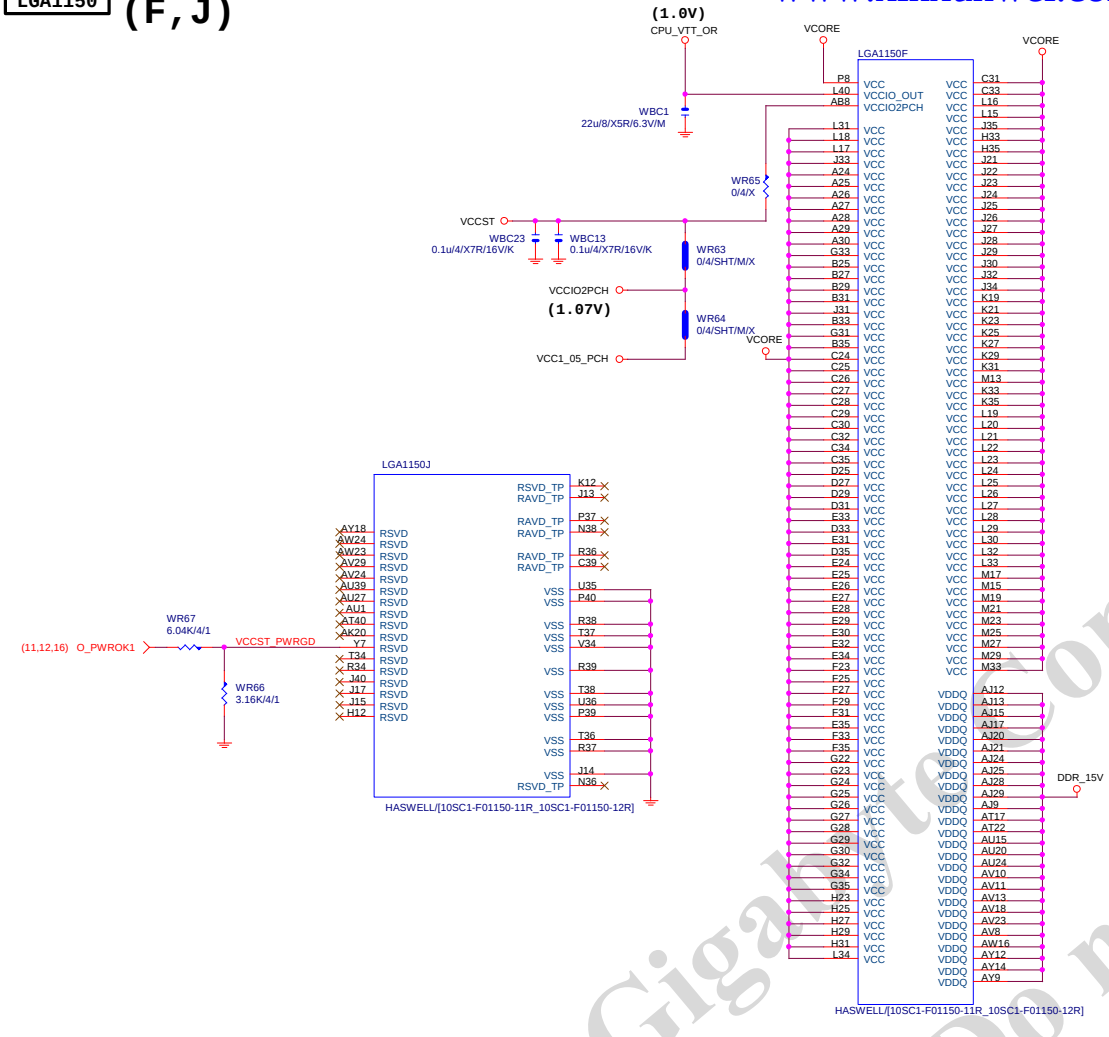
ILM_BP/1156/CSP/ILM_BP/1156/CSP/[12KRC-0F0001-52R_12KRC-0F0001-51R]

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]

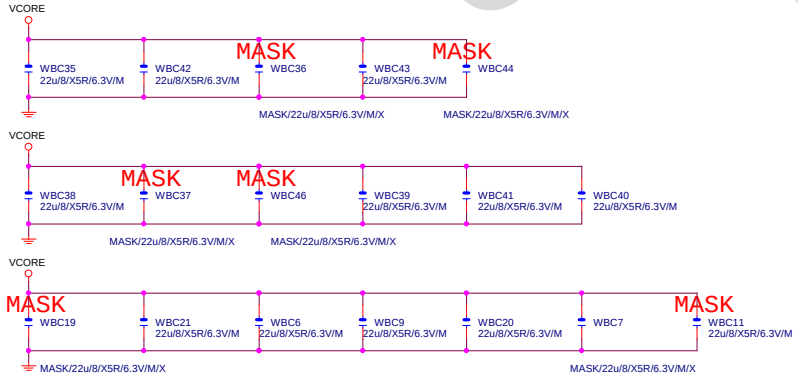
Gigabyte Technology		
Title: CPU LGA1150-B		
Size: Custom	Document Number: GA-H81M-H	Rev: 2.01
Date: Friday, July 04, 2014	Sheet 5 of 29	

LGA1150 (F,J)

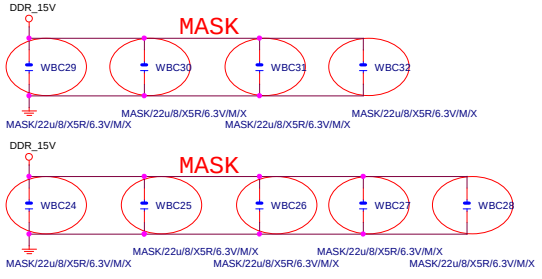


LGA1155 (G,H,I)

VCore CAP (X18)



DDR CAP (X9)



Gigabyte Technology		
Title: CPU LGA1150-C		
Size: Custom	Document Number: GA-H81M-H	Rev: 2.01
Date: Friday, July 04, 2014	Sheet 6 of 29	

DDR3 (A)

DDR3_1

DDRVTT

DDR_15V

N_SMBDATA
N_SMBCLK

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

MAF1 SPR-P200T/6V/8/S
VCC3 VDDSPD

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

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

VREFCA
VREFDQ

(8,12,14,15,20) N_SMBCLK
(8,12,14,15,20) N_SMBDATA

SCL
SDA
SA1
SA0

(5) SBAA2 SBAA1 SBAA0 — BA2 BA1 BA0

(5) CKEA1 CKEA0 — CKE1 CKE0

(5) -CSA1 -CSA0 — S1* S0*

(5) -DCLKA1 DCLKA1 — CK1/NU* CK1/NU

(5) -DCLKA0 DCLKA0 — CK0* CK0

(5) MAAA[0..15] — A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 A10/AP A11 A12 A13 A14 A15

(5,8) -DDR3_RST
(5) -SCASA
(5) -SRASA
(5) -SWEA

RESET* CAS* RAS* WE*

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

DDR3/240/BK/VA/D

BLACK CONNECTOR

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

MDA[0..63] (5)

DDR3 VREF

DDR_15V
MR15 1K/4/1
MR14 1K/4/1
VREF_DDRA
MR4 1K/4/1
MR5 1K/4/1
VREF_DQDDRA
VREF_DQA (5)

DDR15V Decouple

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

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

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

DDRVTT Decouple

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

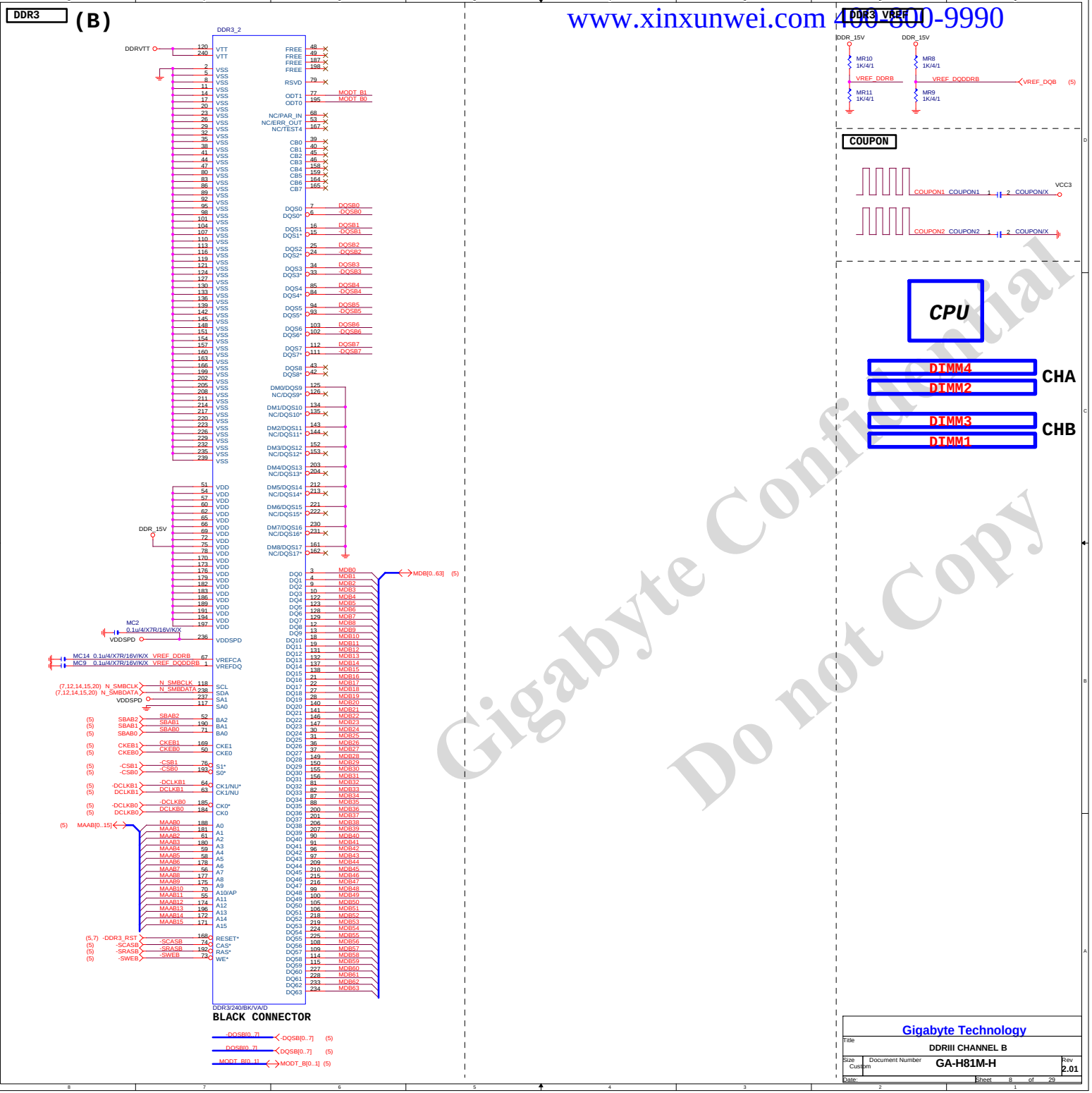
DDRVTT
MBC18 1u/4/X5R/6.3V/K
MBC10 0.1u/4/X7R/16V/K

Gigabyte Technology

Title: DDRIII CHANNEL A

Size: Custom | Document Number: GA-H81M-H | Rev: 2.01

Date: | Sheet 7 of 29



Gigabyte Technology

Title: DDRIII CHANNEL B

Size: Custom | Document Number: GA-H81M-H | Rev: 2.01

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_0TXN L24
(4) A_DMI_0TXP — A_DMI_0TXP K24
(4) A_DMI_0RXN — A_DMI_0RXN C20
(4) A_DMI_0RXP — A_DMI_0RXP B20
(4) A_DMI_1TXN — A_DMI_1TXN G24
(4) A_DMI_1TXP — A_DMI_1TXP H24
(4) A_DMI_1RXN — A_DMI_1RXN D21
(4) A_DMI_1RXP — A_DMI_1RXP B21
(4) A_DMI_2TXN — A_DMI_2TXN F26
(4) A_DMI_2TXP — A_DMI_2TXP G26
(4) A_DMI_2RXN — A_DMI_2RXN B22
(4) A_DMI_2RXP — A_DMI_2RXP C22
(4) A_DMI_3TXN — A_DMI_3TXN K26
(4) A_DMI_3TXP — A_DMI_3TXP L26
(4) A_DMI_3RXN — A_DMI_3RXN A24
(4) A_DMI_3RXP — A_DMI_3RXP B24

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

VCC1_5_PCH — NR50 7.5K/4/1 — DMI_COMP B19
PCIE_COMP C13
NR40 7.5K/4/1

(10) CK_-SRCCLK_PCH — CK_-SRCCLK_PCH G22
(10) CK_SRCCLK_PCH — CK_SRCCLK_PCH F22

DMI_RCOMP
PCIE_RCOMP
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 N_-USBP0 — N_-USBP0 (17)
AU10 N_+USBP0 — N_+USBP0 (17)
AV11 N_-USBP1 — N_-USBP1 (17)
AW11 N_+USBP1 — N_+USBP1 (17)
AN14 N_-USBP2 — N_-USBP2 (23)
AP14 N_+USBP2 — N_+USBP2 (23)
AJ16 N_-USBP3 — N_-USBP3 (23)
AK16 N_+USBP3 — N_+USBP3 (23)
AU15
AV15
AU12
AT12
AV14
AW14
AU17
AT17

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

AW16 N_-USBP8 — N_-USBP8 (20)
AV16 N_+USBP8 — N_+USBP8 (20)
AN16 N_-USBP9 — N_-USBP9 (20)
AP16 N_+USBP9 — N_+USBP9 (20)
AJ18 N_-USBP10 — N_-USBP10 (20)
AK18 N_+USBP10 — N_+USBP10 (20)
AP18 N_-USBP11 — N_-USBP11 (20)
AN18 N_+USBP11 — N_+USBP11 (20)
AW18
AV18
AP20
AN20

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

L14 K14 B12 B11 F14 G14 D11 C11

PCIE Only

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

F11 H11 B9 A9 J11 L11 B8 C8 G9 F9 B7 A7 E7 H7 E1 D2 K6 K8 G3 G5 J2 J3 H2 H1

8111G: (23) LA_ML_IN, (23) LA_ML_IP, (23) LA_ML_ON, (23) LA_ML_OP

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

N/A

PCIE

OC0B_GP59 OC1B_GP40 OC2B_GP41 OC3B_GP42 OC4B_GP43 OC5B_GP9 OC6B_GP10 OC7B_GP14

AE40 N_-USBOC_R (17)
AF37
AD39 N_GPIO14
AD40
AF39 N_-USBOC_F (20)
AC41
AF40
AG40 N_GPIO14

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

AV20 N_USBRBIAS — NR47 22.6/4/1
AU20

USBRBIASB
USBRBIAS

AP11 CK_-DOTCLK
AM11 CK_DOTCLK

CLKIN_DOT96N
CLKIN_DOT96P

NR130 8.2K/4
N_GPIO14 — 3VDUAL

N_-USBOC_F — NBC82 0.1u/4/X7R/16V/K
N_-USBOC_R — NBC83 0.1u/4/X7R/16V/K

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

BD82B85/S/[10HB1-030H81-10R]

PCH (F)

PCHF

(17) PCH_USB3_RXN0 — F20 USB3_RXN_0 — FDI_RXN_0 — N1 FDI_TXN0
(17) PCH_USB3_RXP0 — G20 USB3_RXP_0 — FDI_RXP_0 — N2 FDI_TXP0
(17) PCH_USB3_TXN0 — B18 USB3_TXN_0 — FDI_RXN_1 — P2 FDI_TXN1
(17) PCH_USB3_TXP0 — C18 USB3_TXP_0 — FDI_RXP_1 — P3 FDI_TXP1

(17) PCH_USB3_RXN1 — G18 USB3_RXN_1
(17) PCH_USB3_RXP1 — H18 USB3_RXP_1 — FDI_CSYNC — L2 FDI_CSYNC — FDI_CSYNC (4)
(17) PCH_USB3_TXN1 — B15 USB3_TXN_1
(17) PCH_USB3_TXP1 — B16 USB3_TXP_1 — FDI_INT — L3 FDI_INT — FDI_INT (4)

K20 USB3_RXN_4 — FDI_RCOMP — K2 NR29 7.5K/4/1 — VCC1_5_PCH
L20 USB3_RXP_4
D15 USB3_TXN_4
C15 USB3_TXP_4

N/A

L18 USB3_RXN_5
K18 USB3_RXP_5
B14 USB3_TXN_5
A14 USB3_TXP_5

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

TACH6_GP70
TACH7_GP71

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

Mount for integrated clock Generation Mode

(10) N_PCHCLK14 — N_PCHCLK14 — NRN16 8.2K/8P4R/4
CK_DOTCLK
CK_-DOTCLK

PCH (J)

PCHJ

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

TP22 TP23 TP21 TP20 TP14 TP15 TP12 — U11 U10 AJ14 AK14 K34 K33 AH24
TP10 TP11 TP9 — L16 K16 AM34
TP3 TP4 TP1 TP2 — R12 N12 L22 K22
TP5 TP6 TP7 TP8 — 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

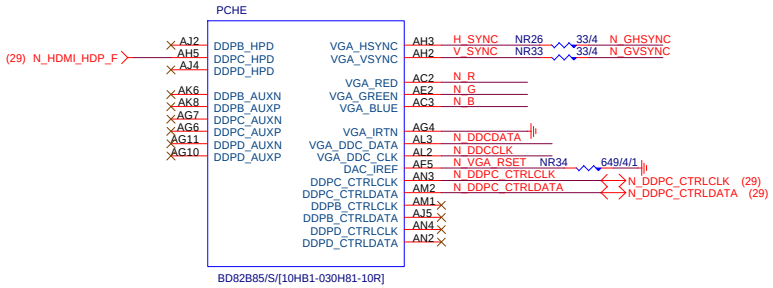
Gigabyte Technology

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

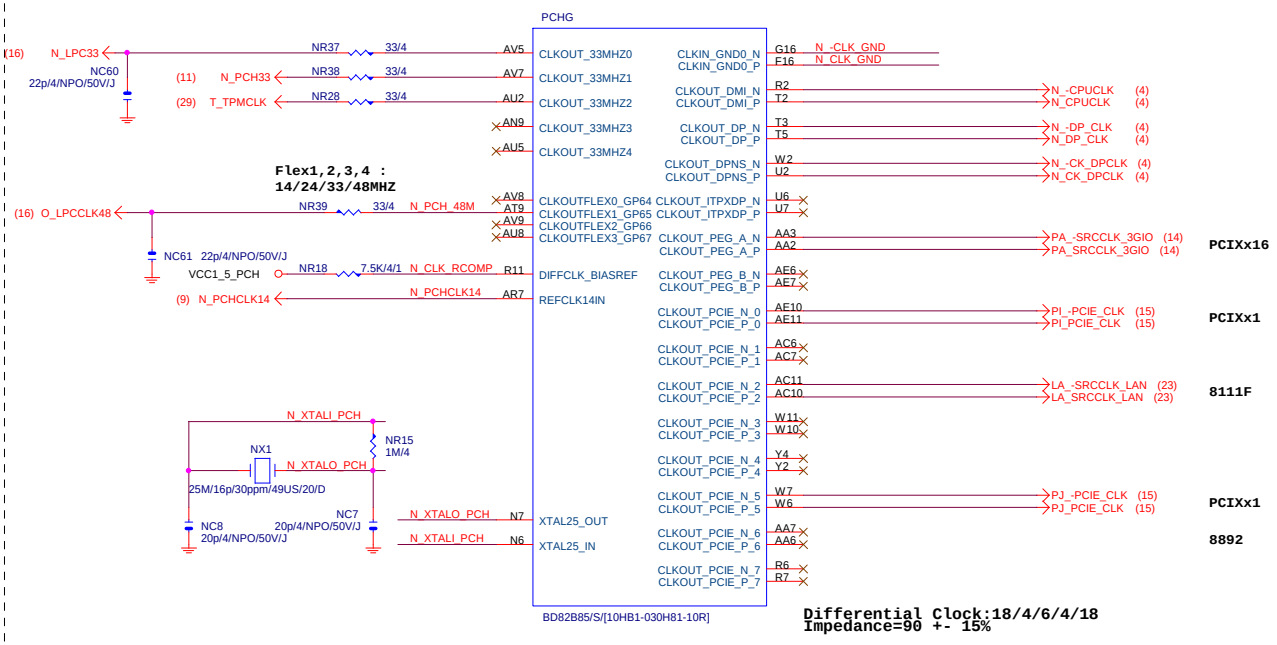
Size: Custom | Document Number: GA-H81M-H | Rev: 2.01

Date: Friday, July 04, 2014 | Sheet 9 of 29

PCH (E)

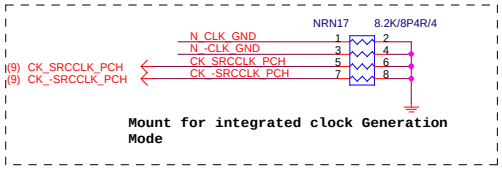


PCH (G)



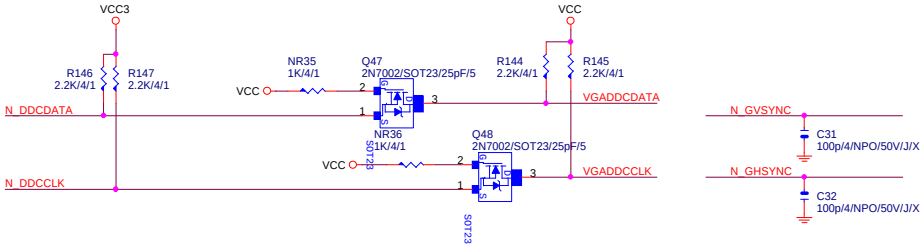
Differential Clock:18/4/6/4/18
Impedance=90 +- 15%

PCH CLK PD

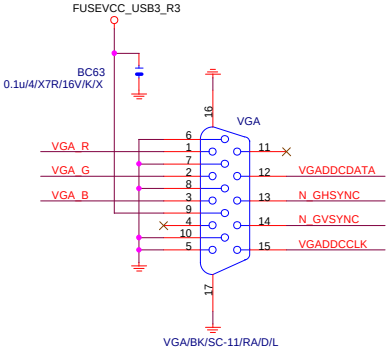


Mount for integrated clock Generation Mode

VGA DDC

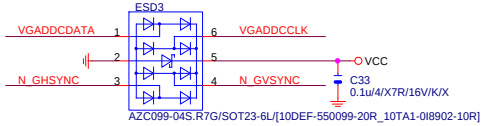


VGA CONNECTOR

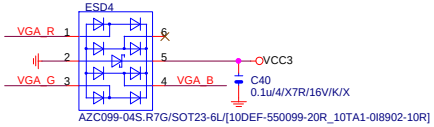


VGA/BK/SC-11/RA/D/L
BLACK CONNECTER

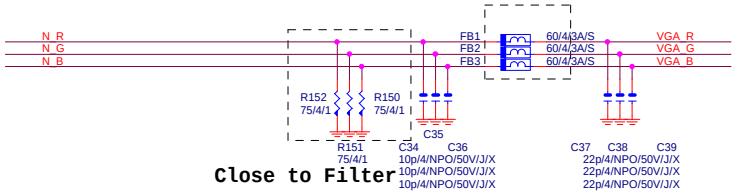
VGA ESD



SSOP6_ESD



VGA DDC



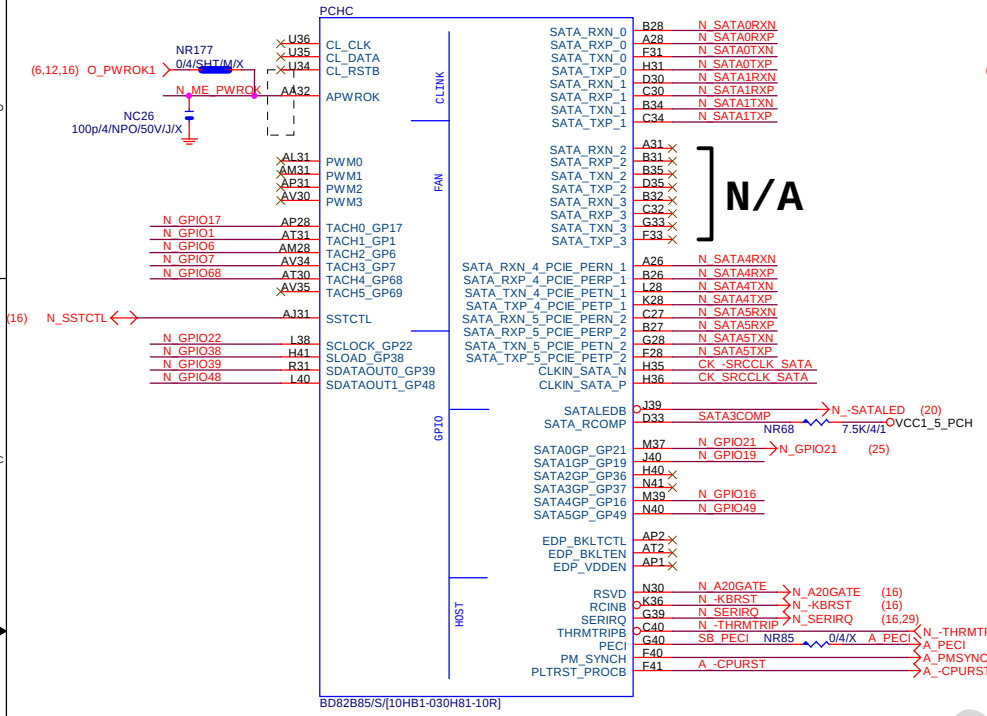
Close to Filter

Gigabyte Technology

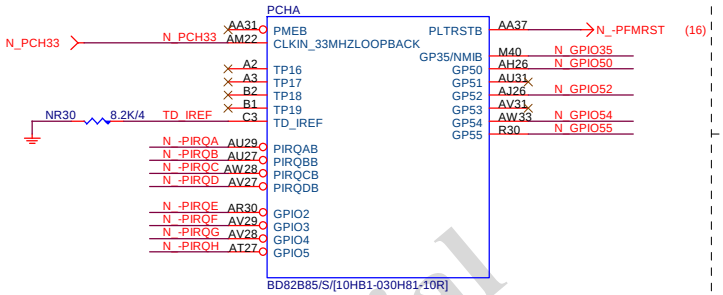
Title	PCH DISPLAY ,CLK BUFFER		
Size: Custom	Document Number: GA-H81M-H		Rev: 2.01
Date: Friday, July 04, 2014	Sheet 10 of 29		

PCH (C)

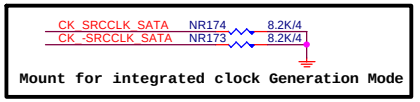
SATA3 : 20/7.5/4.5/7.5/20 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%
SATA2 : 15/7.5/4.5/7.5/15 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%



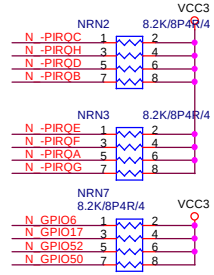
PCH (A)

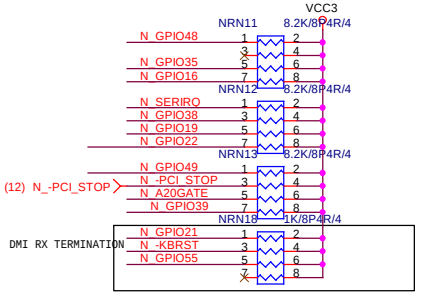


PCH CLK PD

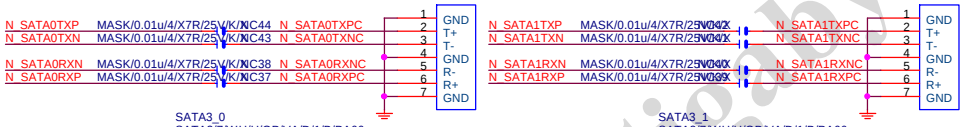


PCH PU/PD





SATA CONNECTOR

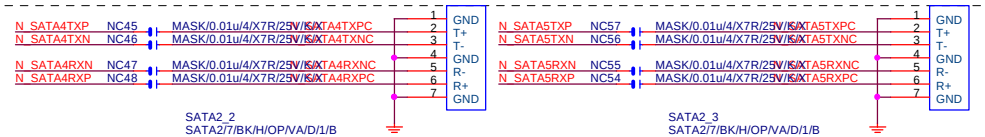


SATA3_0
SATA2/7/WH/H/OP/VA/D/1/B/PA66
WHITE CONNECTOR

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

H81 Port 2/3 N/A

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

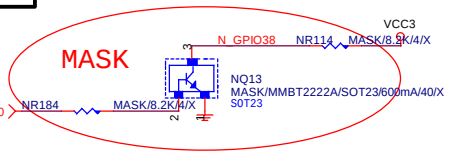


SATA2_2
SATA2/7/BK/H/OP/VA/D/1/B
BLACK CONNECTOR

SATA2_3
SATA2/7/BK/H/OP/VA/D/1/B
BLACK CONNECTOR

ME PWROK

GPIO38 Ctrl



Gigabyte Technology		
Title: PCH HOST , SATA, PCI		
Size: Custom	Document Number: GA-H81M-H	Rev: 2.01
Date: Friday, July 04, 2014	Sheet 11 of 29	

PCH (D)

(16,29) N_LAD[0..3] ← N_LAD[0..3]

PCHD

VCC3 NR54 8.2K/4/X N_GPIO23 AK26

(16,29)	N_LAD0	N_LAD0	AN24	LDRQ1B_GP23 / LAD_0	
(16,29)	N_LAD1	N_LAD1	AP26	LAD_1	
(16,29)	N_LAD2	N_LAD2	AJ24	LAD_2	
(16,29)	N_LAD3	N_LAD3	AN26	LAD_3	
(16)	N_-LDRQ0	N_-LDRQ0	AK22	LDRQ0B	
(16,29)	N_-LFRAME	N_-LFRAME	AP24	LFRAMEB	
(21)	C_ACZ_SDOUT	A_SO	AV23	HDA_BCLK	
(21)	C_ACZ_BITCLK	A_SYC	AU24	HDA_RSTB	
(21)	C_ACZ_SYNC		AT26	HDA_SDI0	
(21)	C_-ACZ_RST		AV22	HDA_SDI1	
	NRN29 33/8P4R/4	(21) C_ACZ_SDIN2	AT22	HDA_SDI2	
		A_SO	AW23	HDA_SDI3	
		A_SYC	AU22	HDA_SDO	
			AV24	HDA_SYNC	

(19)	N_ICH_SPI_MOSI	P40	SPI_MOSI_IO0	
(19)	N_ICH_SPI_MISO	R36	SPI_MISO_IO1	
(19)	N_-ICH_SPI_CS	R38	SPI_CS0B	
(19)	N_ICH_SPI_CLK	U39	SPI_CLK	
		R35	SPI_CS1B	
		R40	SPI_CS2B	
(19)	SPI_DQ2	U40	SPI_IO2	
(19)	SPI_DQ3	U37	SPI_IO3	

N_Y1	AN40	RTCX1	
N_Y2	AN39	RTCX2	
N_-RTCRST	AR38	RTESTB	
N_-SRTCRST	AR39	SRTCRSTB	
N_-INTRUDER	AR41	INTRUDERB	
(6,11,16) O_PWROK1	AT40	PCH_PWROK	
(16,24) O_-RSMRST	AM40	RSMRSTB	
N_INTVRMEN	AV36	INTVRMEN	
N_PCH_DPWROK	AV38	DPWROK	
N_DSWVRMEN	AM41	DSWODVREN	

(16)	N_-LPCPME	N_-LPCPME	AG31	SMBALERTB_GP11
(7,8,14,15,20)	N_SMBCLK	N_SMBCLK	AG36	SMBCLK
(7,8,14,15,20)	N_SMBDATA	N_SMBDATA	AG32	SMBDATA
(11)	N_GPIO60	N_GPIO60	AG35	SML0ALERTB_GP60
		N_SML0CLK	AE32	SML0CLK
		N_SML0DAT	AE35	SML0DATA
		N_-PCH_HOT	AJ39	SML1ALERTB_PCHHOTB_GP74
		N_SML1CLK	AK36	SML1CLK_GP58_MGPIO11
		N_SML1DAT	AK33	SML1DATA_GP75_MGPIO12

		BMBUSYB_GP0	G38	N_GPIO0
		CLKRUNB_GP32	N32	
		DOCKENB_GP33	AV26	N_GPIO33
		STPPCIB_GP34	N34	N_-PCI_STOP (11)
		GP8	AC40	N_-IGC_EN
		LAN_PHY_PWR_CTRL_GP12	AL40	
		HDA_DOCK_RSTB_GP13	AN22	-D_GPIO_HRST
		GP15	AC32	N_TEMP_ALART- (16)
		GP24	AE34	A_-SKTOCC (4)
		GP28	V41	N_GPIO28
		SLP_WLANB_GP29	AL39	N_GPIO29
		PCIECLKRQ0B_GP73	W34	N_GPIO73
		PCIECLKRQ1B_GP18	P39	N_GPIO18
		PCIECLKRQ2B_GP20_SMIB	P37	N_GPIO20
		PCIECLKRQ3B_GP25	AA39	N_GPIO25
		PCIECLKRQ4B_GP26	W35	N_GPIO26
		PCIECLKRQ5B_GP44	AA36	N_GPIO44
		PCIECLKRQ6B_GP45	W32	N_GPIO45
		PCIECLKRQ7B_GP46	AA40	N_GPIO46
		GP57	AC36	N_GPIO57
		SYS_PWROK	W31	N_PCH_VRMPWRGD (16)
		RIB	AE36	N_-RI
		WAKEB	AK34	N_-PCIE_WAKE (14,15,23)
		SLP_AB	AN37	
		SLP_LANB	AU36	
		SLP_S0B	AC35	
		SLP_S3B	AK40	N_-SLP_S3 (16)
		SLP_S4B	AT35	N_-S4_S5 (16)
		SLP_S5B_GP63	AA35	
		SUS_STATB_GP61	AD37	
		SUSCLK_GP62	W36	N_SUSCLK N_SUSCLK (29)
		GP72	AJ40	N_GPIO72
		SUSACKB	AJ37	
		SUSWARNB_SUSPWRDNACK_GP30	AG41	N_-S_WARN
		DRAMPWRGD	AE38	N_DRAM_PWROK
		GP27	AU34	N_GPIO27
		ACPRESENT_GP31_MGPIO2	AM36	N_GPIO31
		SLP_SUSB	AK38	N_-DEPSLP (24)
		PWRBTNB	AK41	O_PWRBTSW (16)
		SYS_RESETB	N36	N_-SYS_RST (20)
		SPKR	R32	N_SPKR (20)
		PROCPWRGD	D40	N_CPUPWROK (4,16)
		TP13	W37	N_PCH_RST
		JTAG_TCK	Y40	N_PCH_TCK
		JTAG_TDI	W39	N_PCH_TDI
		JTAG_TDO	Y38	N_PCH_TDO
		JTAG_TMS	W40	N_PCH_TMS

BD82B85/S/[10HB1-030H81-10R]

DDR_15V
NR131 680/4/1
N_DRAM_PWROK → N_DRAM_PWROK (4)
NR132 1.47K/4/1

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

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

At least 10ms delay after 3VDUAL_PCH stabel

ACZ_SDOUT

PCH_DPWROK

3VDUAL_PCH
NR69 8.2K/4
N_PCH_DPWROK → N_PCH_DPWROK (16)
NC17 1n/4/X7R/50V/K
for IT8620 Ctrl

VCC3
NR345 1K/4/1
N_PCH_VRMPWRGD → N_PCH_VRMPWRGD (16)
NR346 100K/4/1
DC17 0.1u/4/X7R/16V/K

PCH_PU/PD

GP8:Low to enable PCH clock chip
NR106 1K/4/1 N_-IGC_EN

3VDUAL
NRN9 8.2K/8P4R/4: N_GPIO45, N_GPIO46, N_GPIO44, N_GPIO57
NRN10 8.2K/8P4R/4: A_-SKTOCC, N_TEMP_ALART-, N_-RI

SUSCLK:Low to OD PLL VR
GP28:Lo disable VRM ,Hi enable VRM
-D_GPIO_HRST NR51 1K/4/1
N_GPIO28 NR144 1K/4/1
N_GPIO29 NR96 1K/4/1

3VDUAL_PCH
NRN20 8.2K/8P4R/4: N_GPIO27, N_GPIO31, N_-S_WARN, N_GPIO72
N_-PCIE_WAKE NR76 1K/4/1

VCC3
N_GPIO33 NR49 8.2K/4
NRN21 8.2K/8P4R/4: N_GPIO0, N_-SYS_RST, N_GPIO20

3VDUAL
NRN22 200/8P4R/4: N_PCH_RST, N_PCH_TDI, N_PCH_TMS, N_PCH_TDO
NRN23 100/8P4R/4: N_PCH_TDI, N_PCH_TMS, N_PCH_TDO
N_PCH_TCK NR108 51/4/1
NRN24 8.2K/8P4R/4: N_GPIO18, N_GPIO26, N_GPIO73, N_GPIO25
N_-SYS_RST NC58 1n/4/X7R/50V/K
N_DRAM_PWROK NC59 1n/4/X7R/50V/K

3VDUAL
NRN6 8.2K/8P4R/4: N_-LPCPME, N_GPIO60, N_-PCH_HOT
NRN25 1K/8P4R/4: N_SML1DAT, N_SML1CLK, N_SMBCLK, N_SMBDATA
NR122 499/4/1 N_SML0CLK
NR123 499/4/1 N_SML0DAT

HSW_STRAP13

32.768KHZ

NX2-SHT SHW/D0.64*5.08*6.74

N_Y1 — N_Y2 — NR75 10M/4 — NX2
32.768K/12.5p/20ppm/TF38/35K/D
NC16 18P/4/NPO/50V/J
NC18 18P/4/NPO/50V/J

CLR_CMOS

BATTERY CR2032
NR340 0/6/SHT/M/X
BAT BAT-SK/BK/P/S/D/SN
3VDUAL_PCH — N_VBATT — NRB 1K/4/1
ND1 BAS40-05/0.2A/SOT23
NR90 390K/4 N_DSWVRMEN
N_RTCVDD (13,18)
NR67 390K/4 N_INTVRMEN
NR78 20K/4/1 N_-RTCRST
NC15 1u/4/X5R/6.3V/K
NC20 1u/4/X5R/6.3V/K
RB_TP — N_VBAT → N_VBAT (16)

CLR_CMOS
N_-RTCRST
PH/1*2/BK/2.54/VA/D

BATTERY-DUAL-4

RB 必须放在BAT外

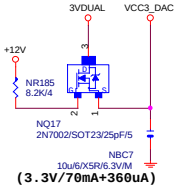
N_-INTRUDER NR74 1M/4 → N_RTCVDD (13,18)
N_-SRTCRST NR77 20K/4/1 → N_RTCVDD (13,18)
NC19 1u/4/X5R/6.3V/K

Gigabyte Technology			
Title: PCH GPIO , CTRL , AUDIO			
Size: Custom	Document Number: GA-H81M-H		Rev: 2.01
Date: Friday, July 04, 2014	Sheet 12 of 29		

PCH (H)

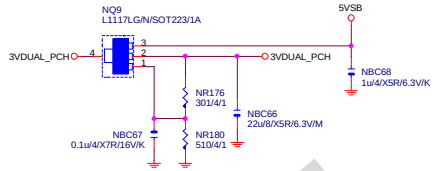
VCC3_DAC

CLOSE北橋(注意震盪水波紋)



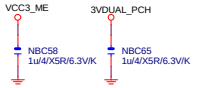
(3.3V/70mA+360uA)

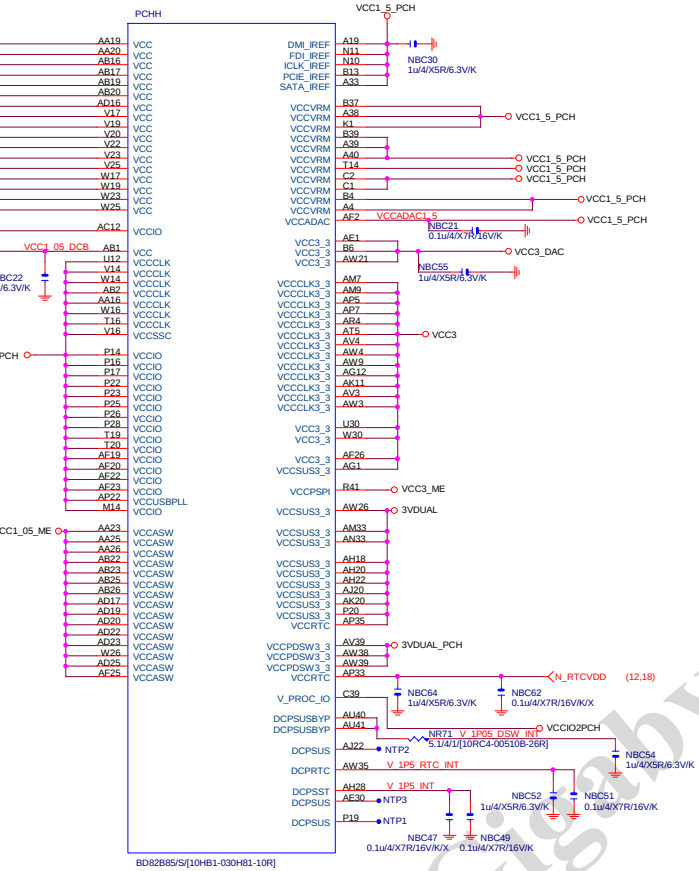
3VDUAL_PCH



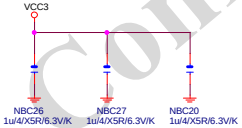
SHT PWR

CAP





(3.3V)(X6)

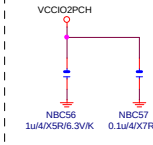


Remove

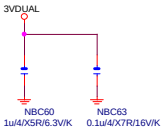
(1.05V)(X5)

(1.05V)(X6)

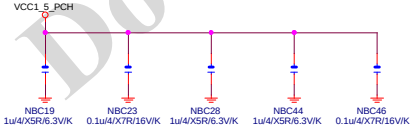
(1.05V)(X2)



(3.3V)(X2)

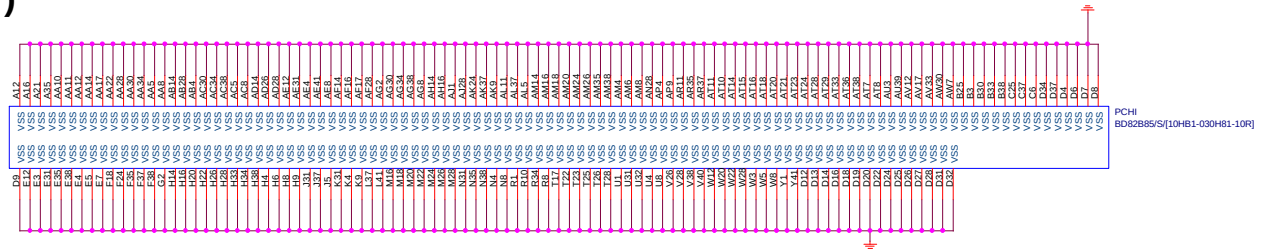


(1.05V)(X10)



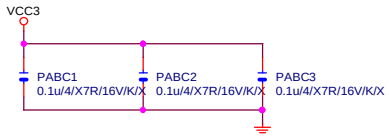
Remove

PCH (I)

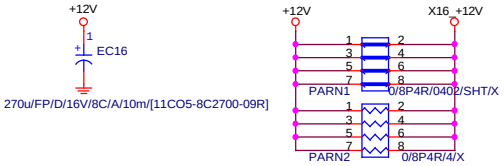


Gigabyte Technology		
Title: PCH PWR ,GND		
Size: Custom	Document Number: GA-H81M-H	Rev: 2.01
Date: Friday, July 04, 2014	Sheet 13 of 29	

PCIEX16 CAP



PCIEX16 PROTECT SHT



PCIEX16 AC CAP

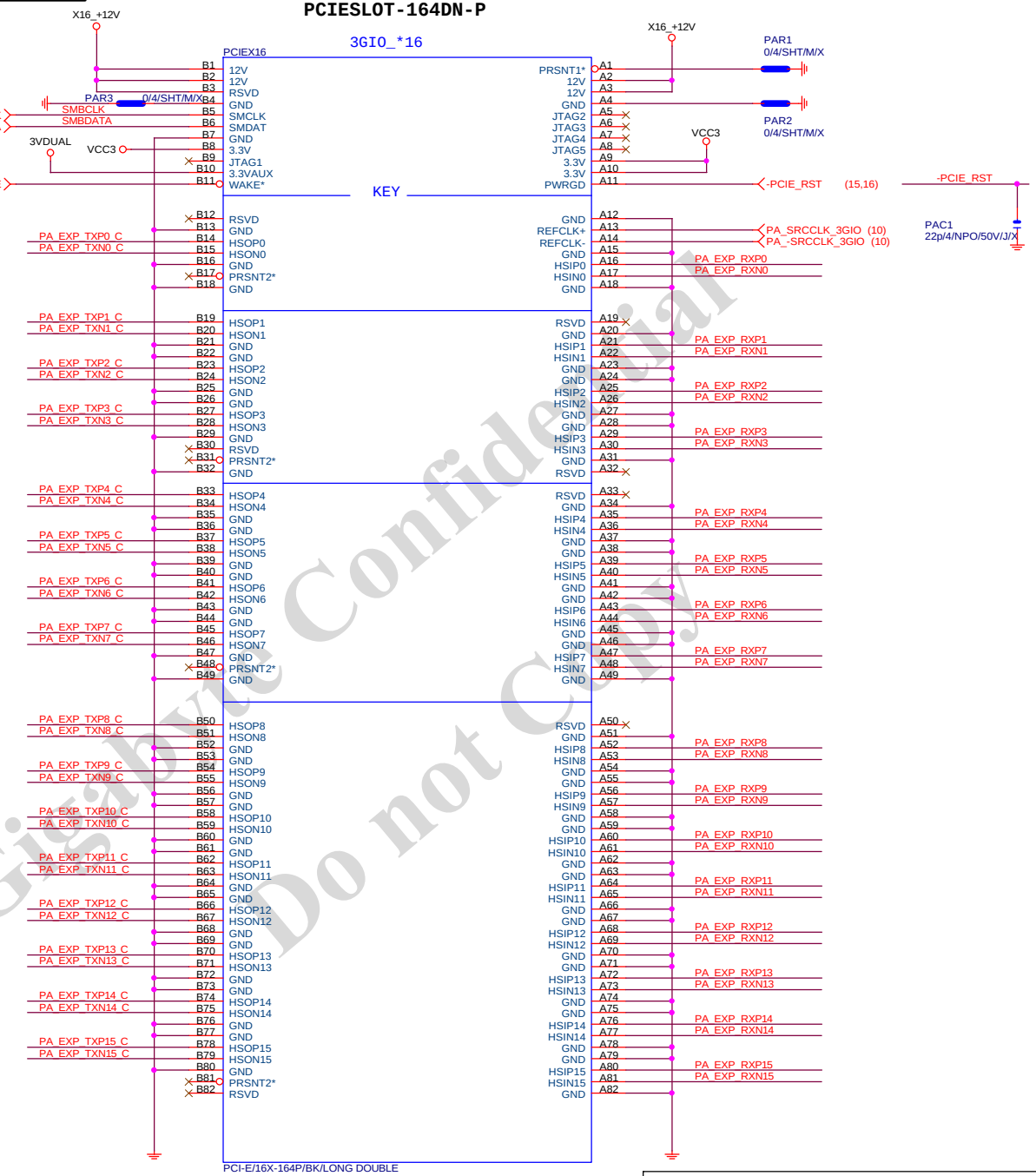
PA_EXP_TXP0	PAC5	0.22u/4/X5R/6.3V/K	PA_EXP_TXP0_C
PA_EXP_TXN0	PAC4	0.22u/4/X5R/6.3V/K	PA_EXP_TXN0_C
PA_EXP_TXP1	PAC6	0.22u/4/X5R/6.3V/K	PA_EXP_TXP1_C
PA_EXP_TXN1	PAC7	0.22u/4/X5R/6.3V/K	PA_EXP_TXN1_C
PA_EXP_TXP2	PAC8	0.22u/4/X5R/6.3V/K	PA_EXP_TXP2_C
PA_EXP_TXN2	PAC9	0.22u/4/X5R/6.3V/K	PA_EXP_TXN2_C
PA_EXP_TXP3	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

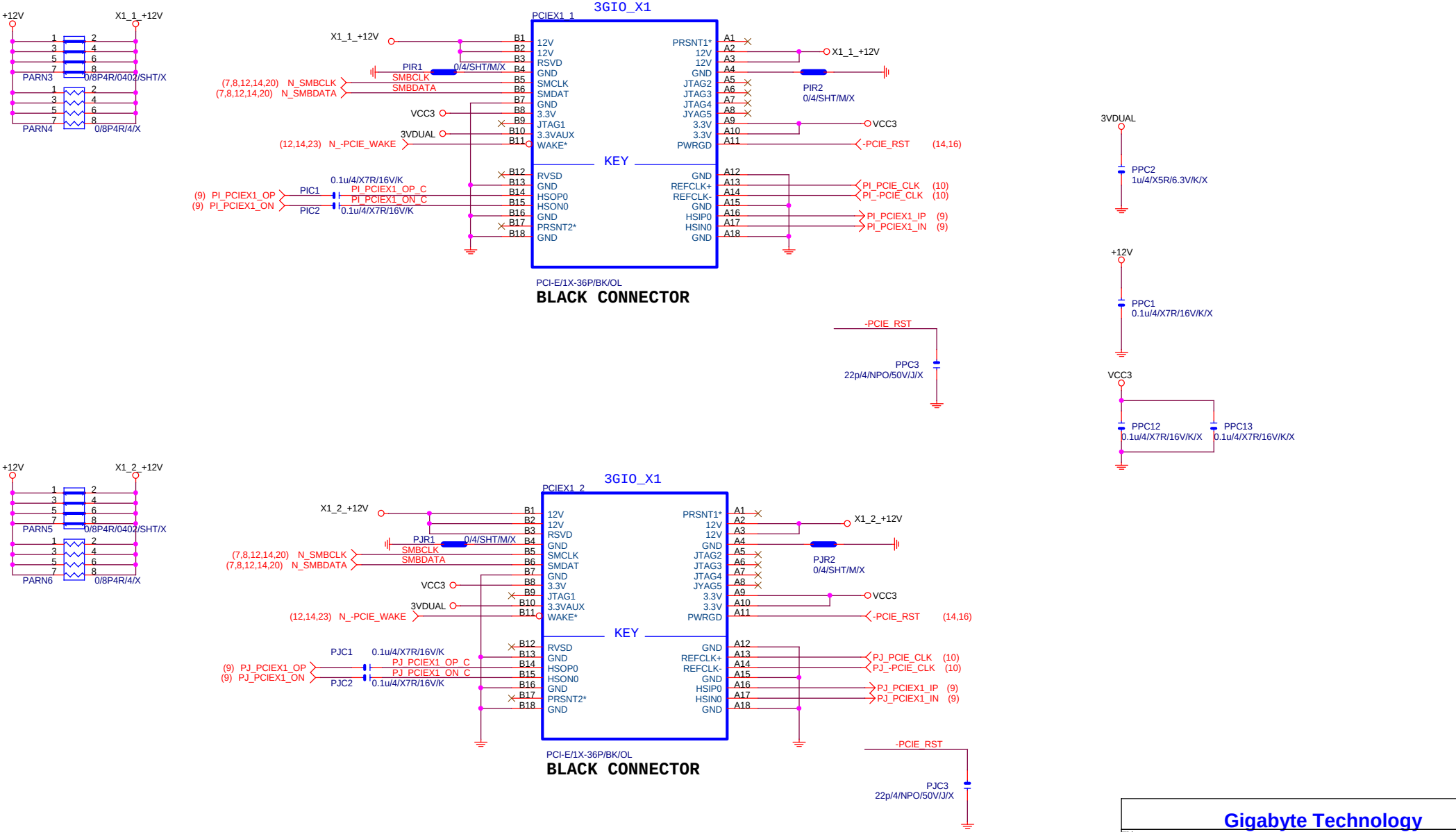


BLACK CONNECTOR

Gigabyte Technology		
Title: PCI EXPRESS * 16		
Size: Custom	Document Number: GA-H81M-H	Rev: 2.01
Date: Friday, July 04, 2014	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: 2.01

Date: Friday, July 04, 2014 | Sheet 15 of 29

SIO IT8620

IT8620E_BX

IT8620E/BX/S

PWR SHT

For 8728 EUP function

SIO PU

新增

SIO STRAP

H61M-S2 1.1 JP6 stuff pull down

EUP control by PCH

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

Power leakage

Fix Power issue

For IT8721 Power leakage

DUAL BIOS OPT STRAP

H81M-DS1 Single BIOS

SIO_18V

internal power pin, max 22nF cap

MB ID

SIO CAP

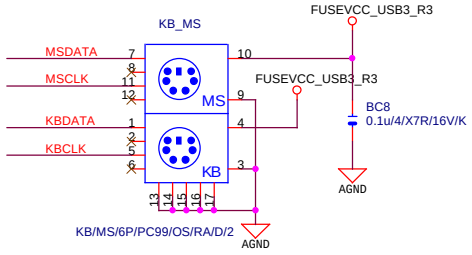
Gigabyte Technology	
Title	PCH GPIO , CTRL , AUDIO
Size C	Document Number GA-H81M-H Rev 2.01
Date: Friday, July 04, 2014	Sheet 16 of 29

COM

COM RI

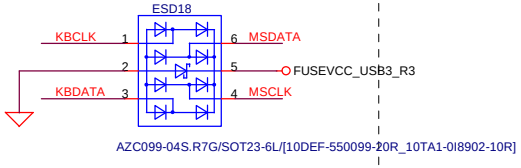
KB/MS

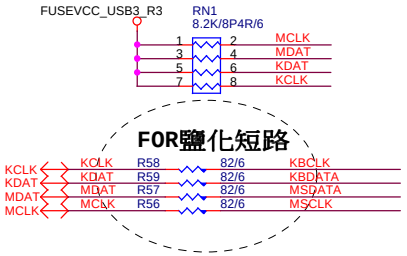
KB_MS

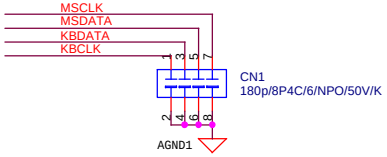


KB_MS ESD

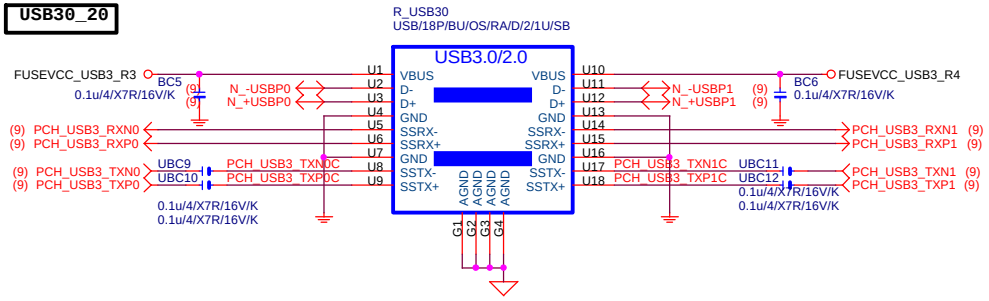
H61M-DS2 R0.2





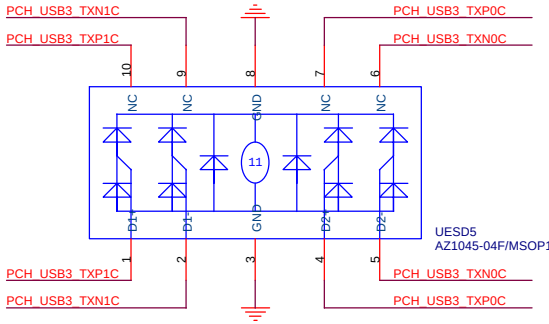


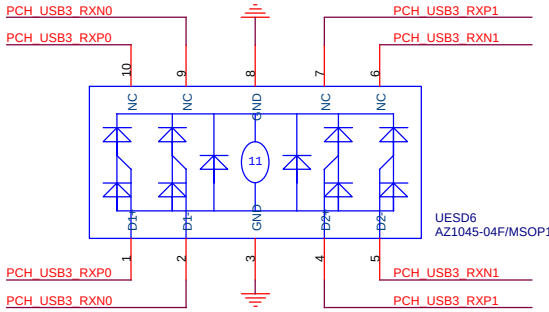
USB30_20



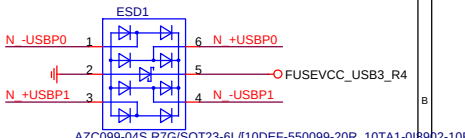
USB30_20 ESD PROCTECT

USB3.0 ESD

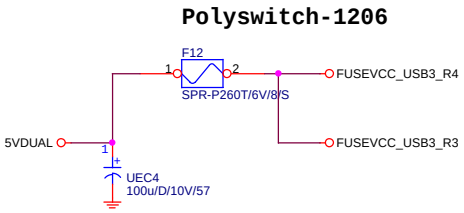




USB POWER PROTECT

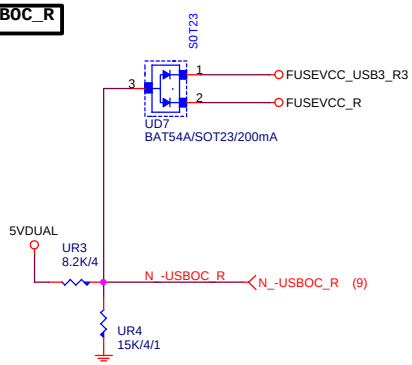


USB30_20 PWR



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

-USBOC_R



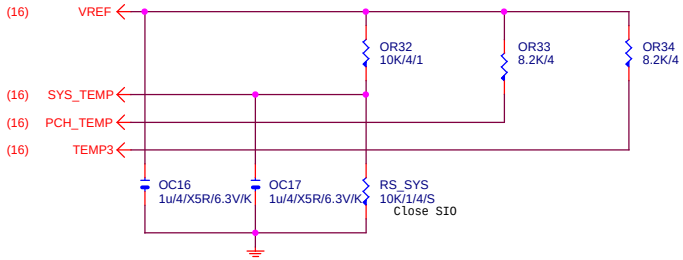
Gigabyte Technology

Title: COM,-RI,KB_USB,USB_ESATA,-PROCHOT

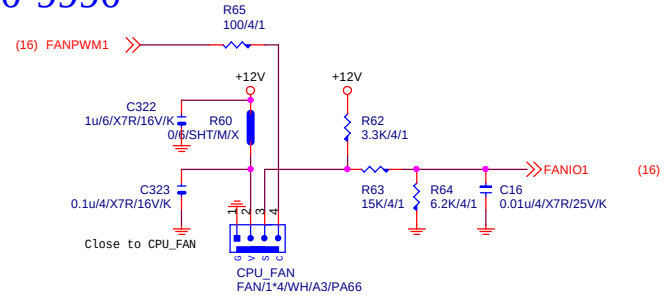
Size: Custom | Document Number: GA-H81M-H | Rev: 2.01

Date: Friday, July 04, 2014 | Sheet 17 of 29

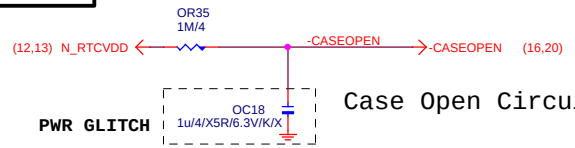
TEMP H/W MONITOR



CPU SMART FAN

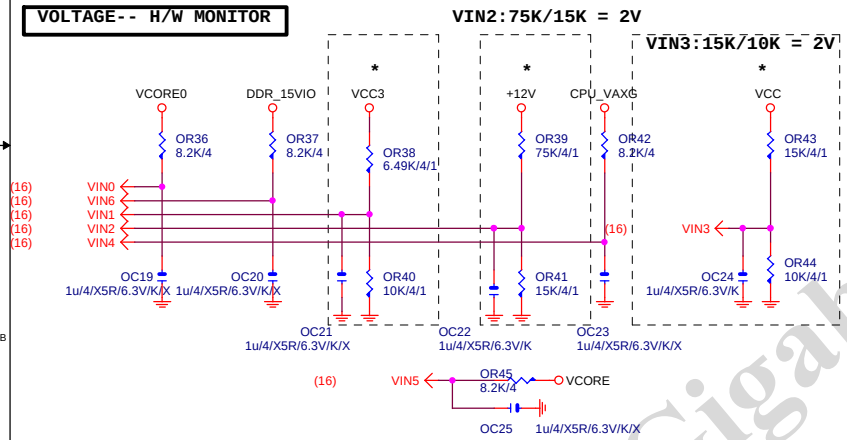


CASE OPEN



Case Open Circuits

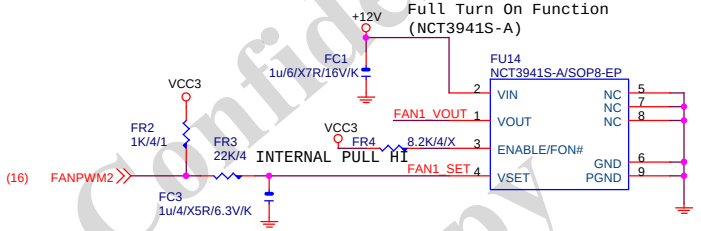
VOLTAGE-- H/W MONITOR

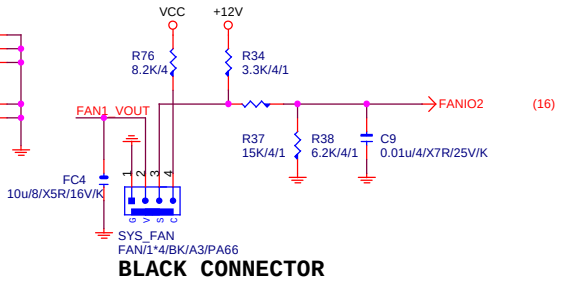


SYS SMART FAN

Linear SYS_FAN

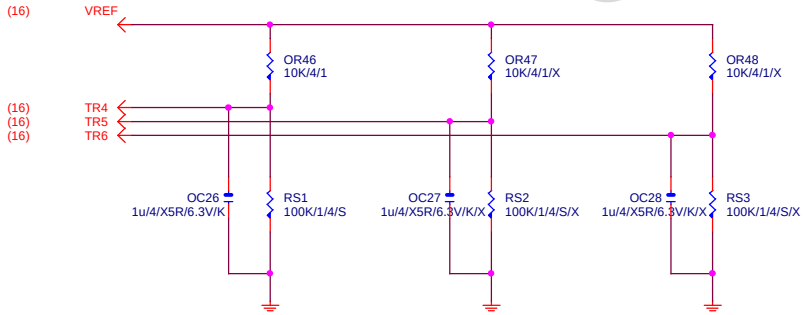
Enable Function (NCT3941S)
Full Turn On Function
(NCT3941S-A)





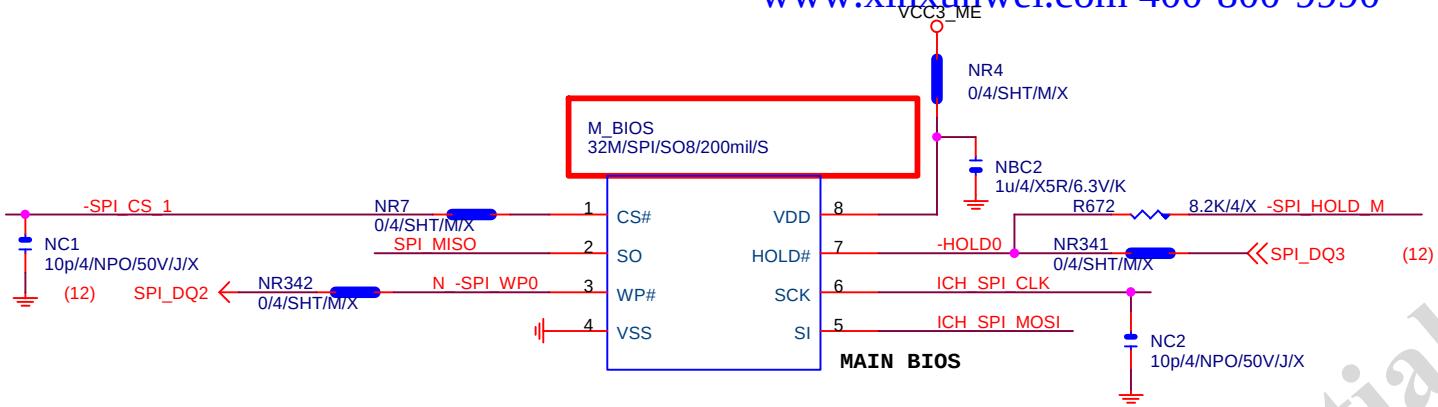
BLACK CONNECTOR

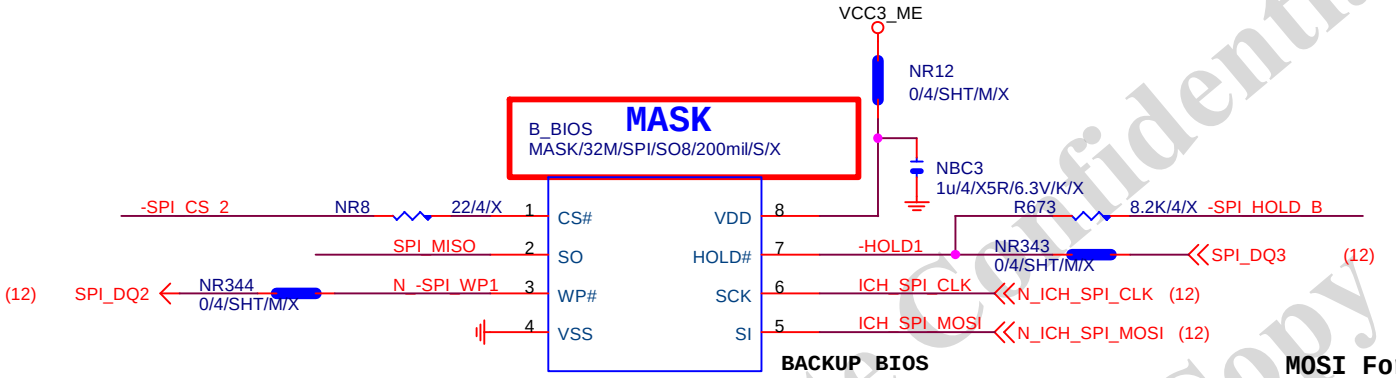
-PROHOT



RS1、RS2、RS3 CLOSE CPU
VR MOSFET

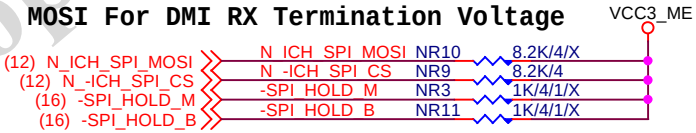
Gigabyte Technology		
Title: HWM,FAN CTRL,OV		
Size: Custom	Document Number: GA-H81M-H	Rev: 2.01
Date: Friday, July 04, 2014	Sheet 18 of 29	

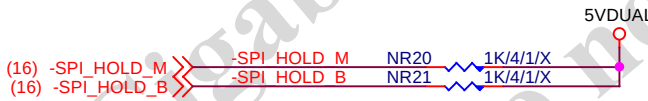


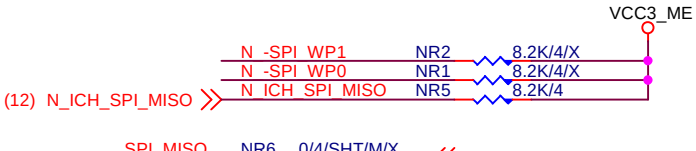


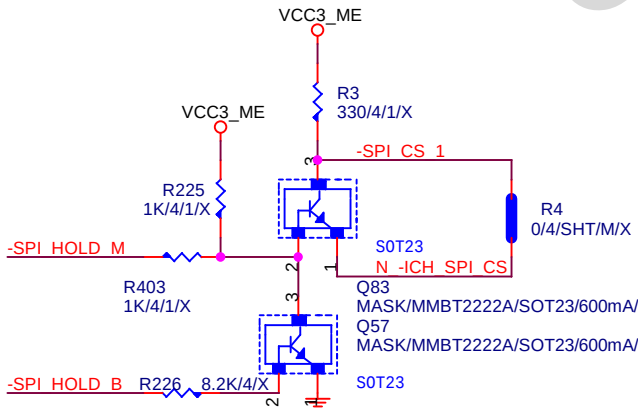
BOOT DEVICE	GNT0	GNT1
LPC	0	0
PCI	0	1
NAND	1	0
SPI	1	1

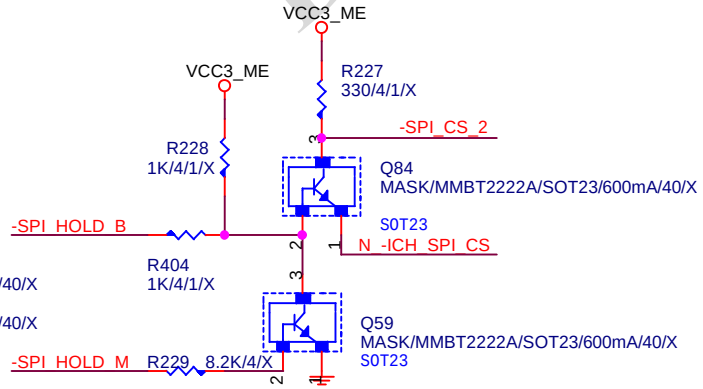
1 means floating
0 means PD 1K



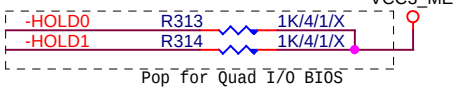








CHECK



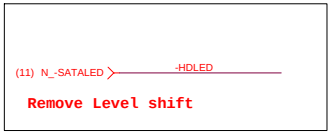
Gigabyte Technology

Title: **DUAL BIOS**

Size: Custom | Document Number: **GA-H81M-H** | Rev: **2.01**

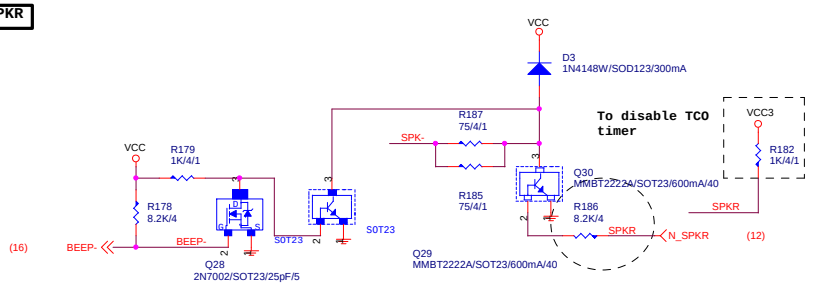
Date: Friday, July 04, 2014 | Sheet 19 of 29

SATA LED

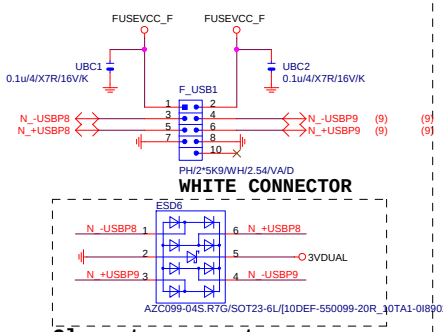


-USBOC_F

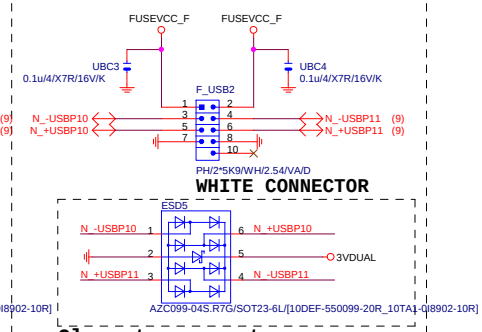
SPKR



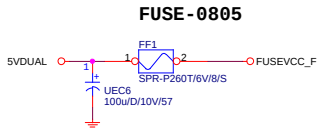
FRONT USB1

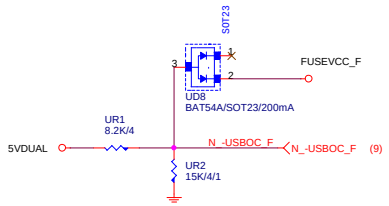


FRONT USB2



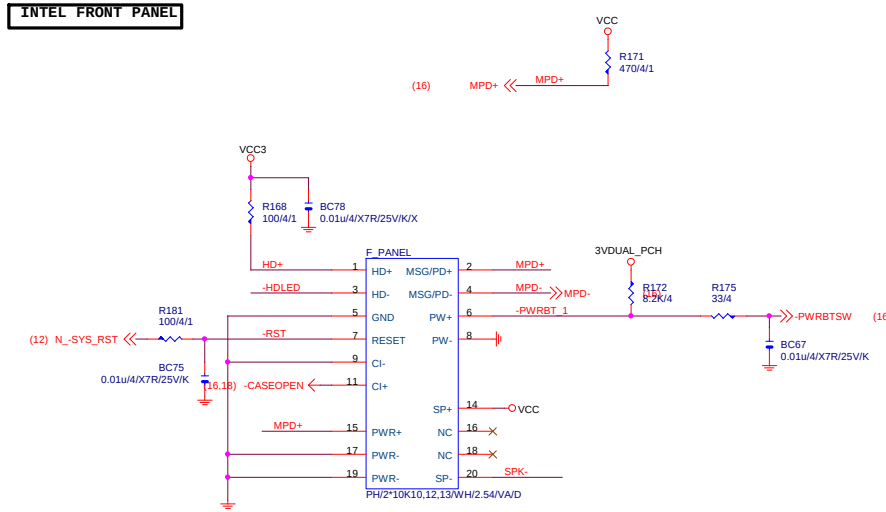
FUSE-0805

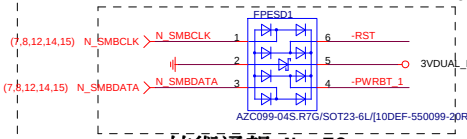




F_USB1, F_USB2 4-Port 2.6A

INTEL FRONT PANEL





技術通報 No.79

Gigabyte Technology

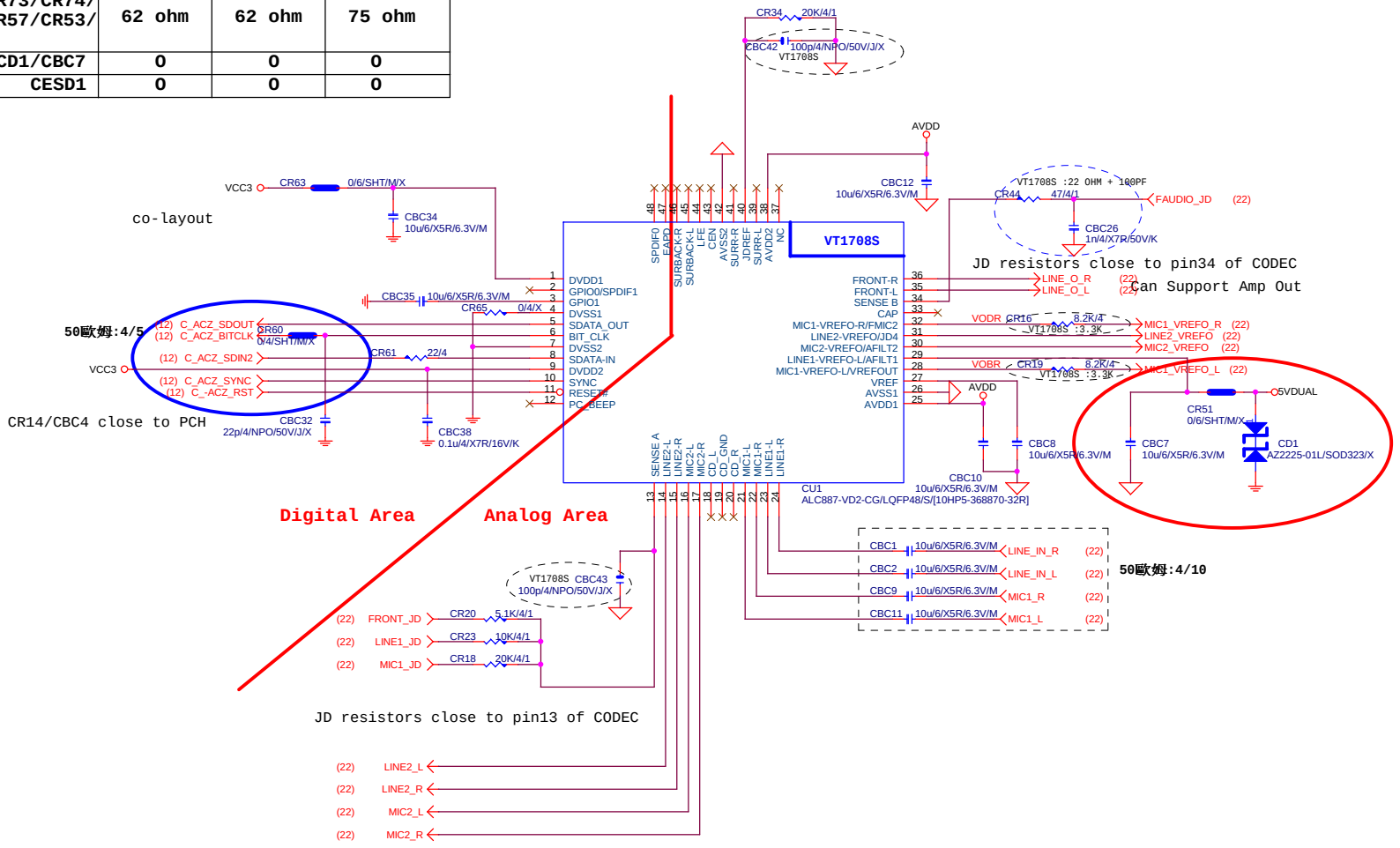
Title: FP,F_USB,USB PWR,SPKR,SATA LED

Size: Custom | Document Number: GA-H81M-H | Rev: 2.01

Date: Friday, July 04, 2014 | Sheet 20 of 29

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

	ALC892	ALC887-VD2	VT1708S-CE
CR44/CBC26	47ohm+1nF	47ohm+1nF	22ohm+100P
CBC42/CBC43	X	X	100P/4
CR6/CR7/CR58/CR54/ CR67/CR68/CR69/CR70	22K/4	22K/4	10K/4/1
CR5/CR8/CR1/CR14/ CR17/CR22/CR73/CR74/ CR13/CR11/CR57/CR53/ CR75/CR76	62 ohm	62 ohm	75 ohm
CR51/CD1/CBC7	0	0	0
CESD1	0	0	0



Title	HD AUDIO ALC887B-VD2/VT1708S/VT2021
Size	Custom
Document Number	GA-H81M-H
Rev	2.01
Date:	Friday, July 04, 2014
Sheet	21 of 29

Gigabyte Technology

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

LINE-OUT

(21) LINE_O_R — CEC1 100u/D/10V/57 — CR5 62/4 — CR7 22K/4 — CR6 22K/4 — AJ_B5
(21) LINE_O_L — CEC2 100u/D/10V/57 — CR8 62/4 — AJ_B2
CBC19 180p/4/NPO/50V/J/X
CBC24 180p/4/NPO/50V/J/X

Only reserved for ALC888

LINE-IN

(21) LINE_IN_R — CR1 62/4 — AJ_A5
(21) LINE_IN_L — CR14 62/4 — AJ_A2
CBC20 180p/4/NPO/50V/J/X
CBC23 180p/4/NPO/50V/J/X

Verify MIC function in LINE-in

For 889A/888

MIC-IN

(21) MIC1_R — CR17 62/4 — AJ_C5
(21) MIC1_L — CR22 62/4 — AJ_C2
(21) MIC1_VREFO_L
(21) MIC1_VREFO_R
CBC3 180p/4/NPO/50V/J/X
CBC4 180p/4/NPO/50V/J/X

SPDIF_OUT

AZALIA FRONT PANEL

CQ4 BAT54A/SOT23/200mA — (21) LINE2_VREFO
CQ2 BAT54A/SOT23/200mA — (21) MIC2_VREFO
VT1708S :3.3K 改排阻
CRN1 8.2K/8P4R/4

(21) MIC2_L — CBC6 10u/6/X5R/6.3V/M — CR13 62/4 — M2_L
(21) MIC2_R — CBC5 10u/6/X5R/6.3V/M — CR11 62/4 — M2_R
L2_R — CR57 62/4 — L2-R
(21) FAUDIO_JD
L2_L — CR53 62/4 — L2-L
CR12 0/4/X

(21) LINE2_R — CEC9 100u/D/10V/57 — L2_R
(21) LINE2_L — CEC6 100u/D/10V/57 — L2_L

CR58 22K/4
CR54 22K/4
F_AUDIO
CR55 20K/4/1
CR59 39.2K/4/1
VCC3
CR78 8.2K/4/X
PH/2*5K8/BK/2.54/VA/D
BLACK CONNECTOR

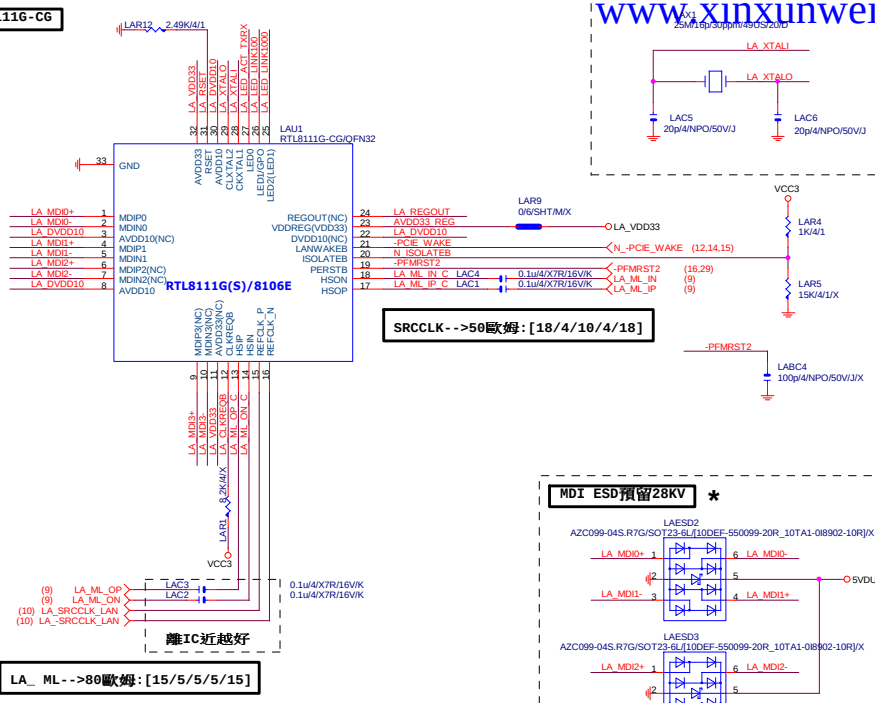
CBC30 180p/4/NPO/50V/J/X
CBC29 180p/4/NPO/50V/J/X
CBC37 180p/4/NPO/50V/J/X
CBC36 180p/4/NPO/50V/J/X

AUDIO
(21) LINE1_JD — LINE1_JD — AJ_A5 — AJ_A2 — C4 C3 C5 C2 — **BLUE LINE-IN**
(21) FRONT_JD — FRONT_JD — AJ_B5 — AJ_B2 — B4 B3 B5 B2 — **GREEN LINE-OUT**
(21) MIC1_JD — MIC1_JD — AJ_C5 — AJ_C2 — A4 A3 A5 A2 A1 — **PINK MIC-IN**
GND
MH1 MH2 MH3 MH4 MH5
A3RP/13P/BL,LI,PK/RA/D/1/B

Gigabyte Technology

Title	AUDIO JACK	
Size: Custom	Document Number: GA-H81M-H	Rev: 2.01
Date: Friday, July 04, 2014	Sheet 22 of 29	

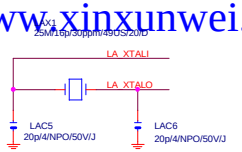
LAN RTL8111G-CG

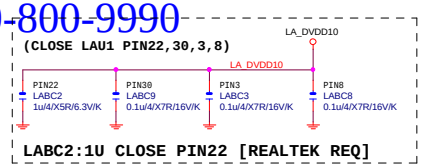


SRCCLK-->50歐姆:[18/4/10/4/18]

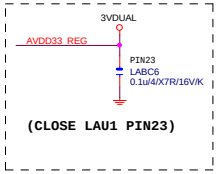
LA_ ML-->80歐姆:[15/5/5/5/15]

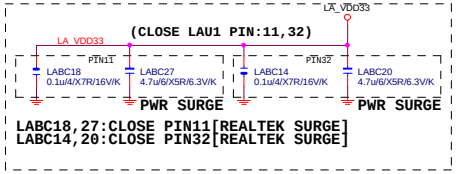
LAN POWER



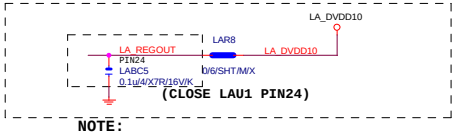


LABC2:1U CLOSE PIN22 [REALTEK REQ]



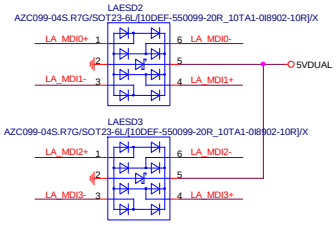


LABC18,27:CLOSE PIN11[REALTEK SURGE]
LABC14,20:CLOSE PIN32[REALTEK SURGE]



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

MDI ESD預留28KV *



BOM NOTICE *

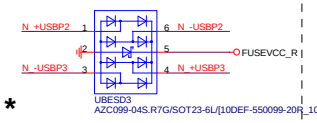
料號	規格	廠商
11NR6-702009-96R	1G LAN (12core)	UDE(RU9 ESD+)

[LED獨立走線,可省略外加AZC099料件LAESD1]

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

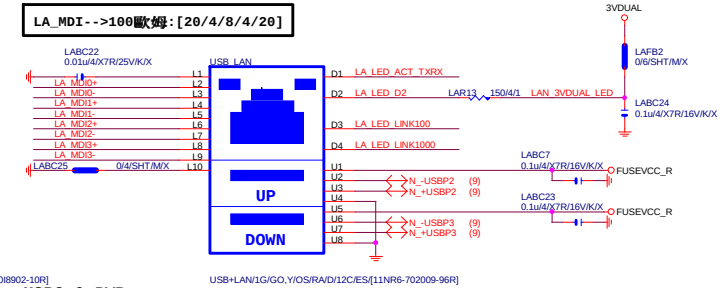
USB_LAN CONNECTOR

RMA ESD PROTECT



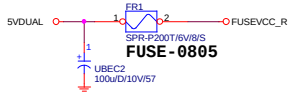
* 使用RU9 USB_LAN可省略LAESD1保護LED

LA_MDI-->100歐姆:[20/4/8/4/20]



USB2.0 PWR

FR1 CLOSE TO USB_LAN



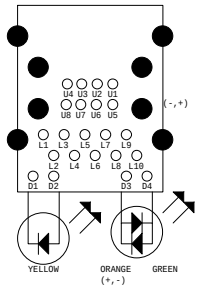
Close to connector

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

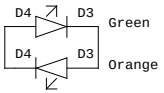
USB X3 POWER

EMI SHORT PAD

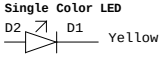
PS:視EMI需求



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

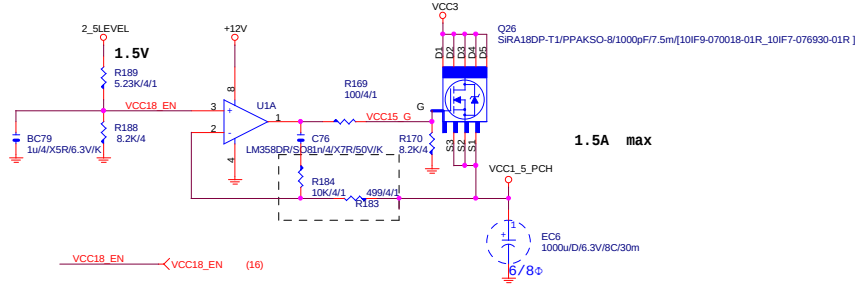
Gigabyte Technology

Title: Realtek RTL8111G

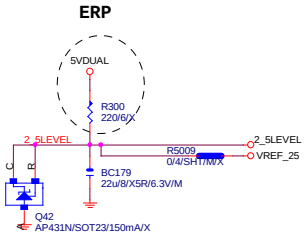
Size: Custom | Document Number: GA-H81M-H | Rev: 2.01

Date: Friday, July 04, 2014 | Sheet 23 of 29

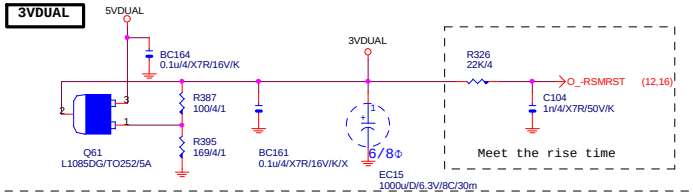
VCC1_8_PCH



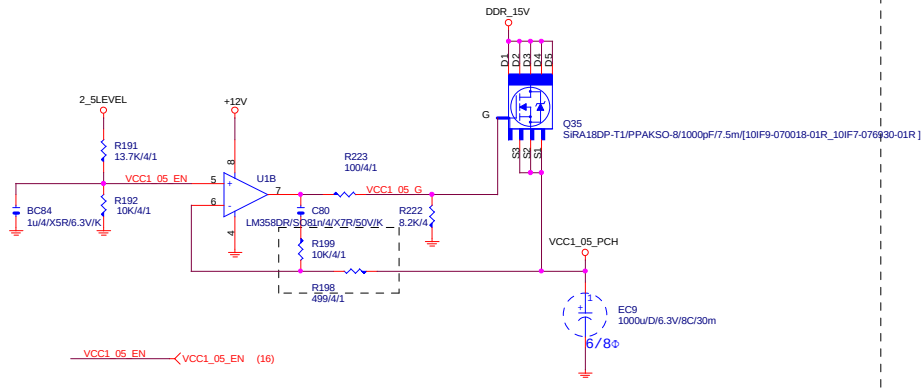
2_5LEVEL

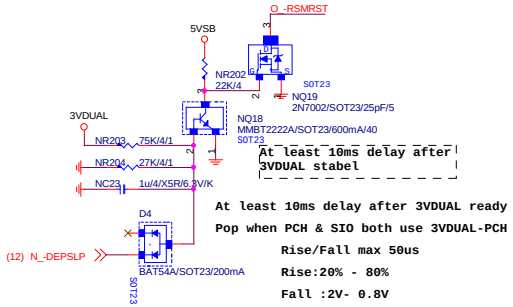


3VDUAL

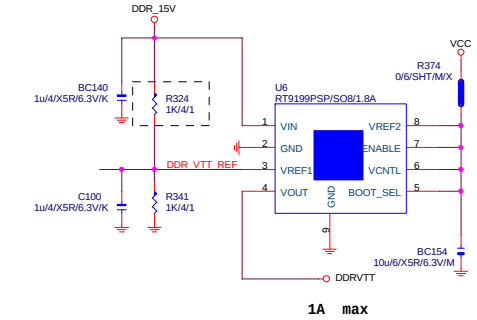


VCC1_05_PCH

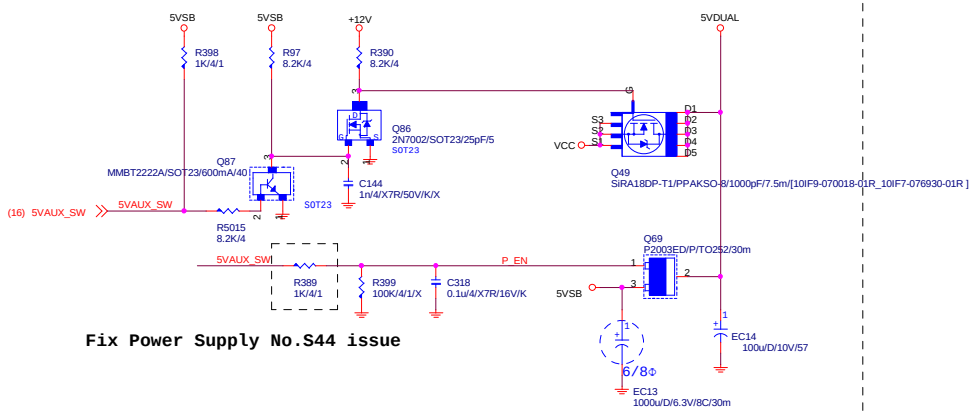




DDRVTT



5VDUAL

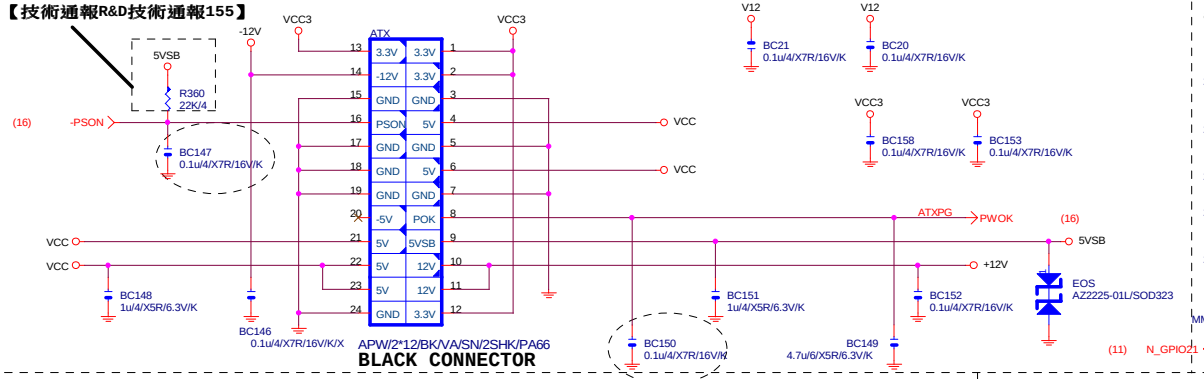


5VDUAL SHORT PROTECT

Gigabyte Technology		
Title: DISCRETE POWER		
Size: Custom	Document Number: GA-H81M-H	Rev: 2.01
Date: Friday, July 04, 2014	Sheet 24 of 29	

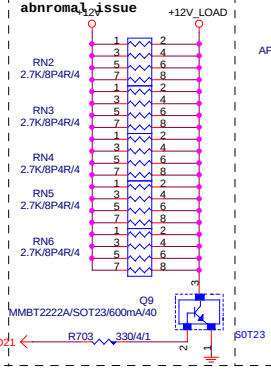
ATXX24 POWER CONNECTOR

【技術通報R&D技術通報155】

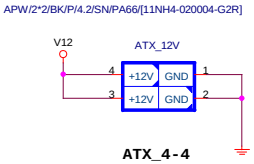


【技術通報R&D技術通報158】

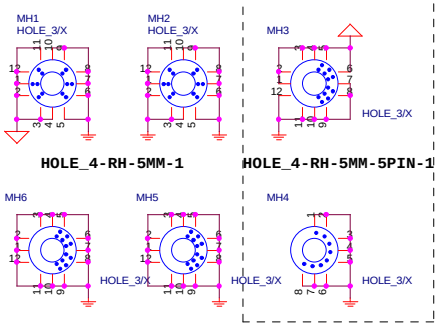
To fix 12V light load abnroma l issue

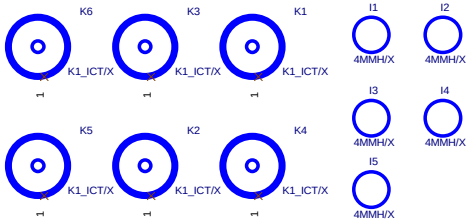


ATXX4 POWER CONNECTOR



TPM

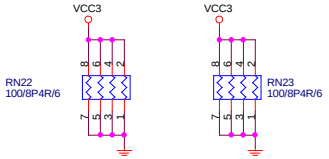




To prevent the 5VSB under loading when boot

PWOK PATCH

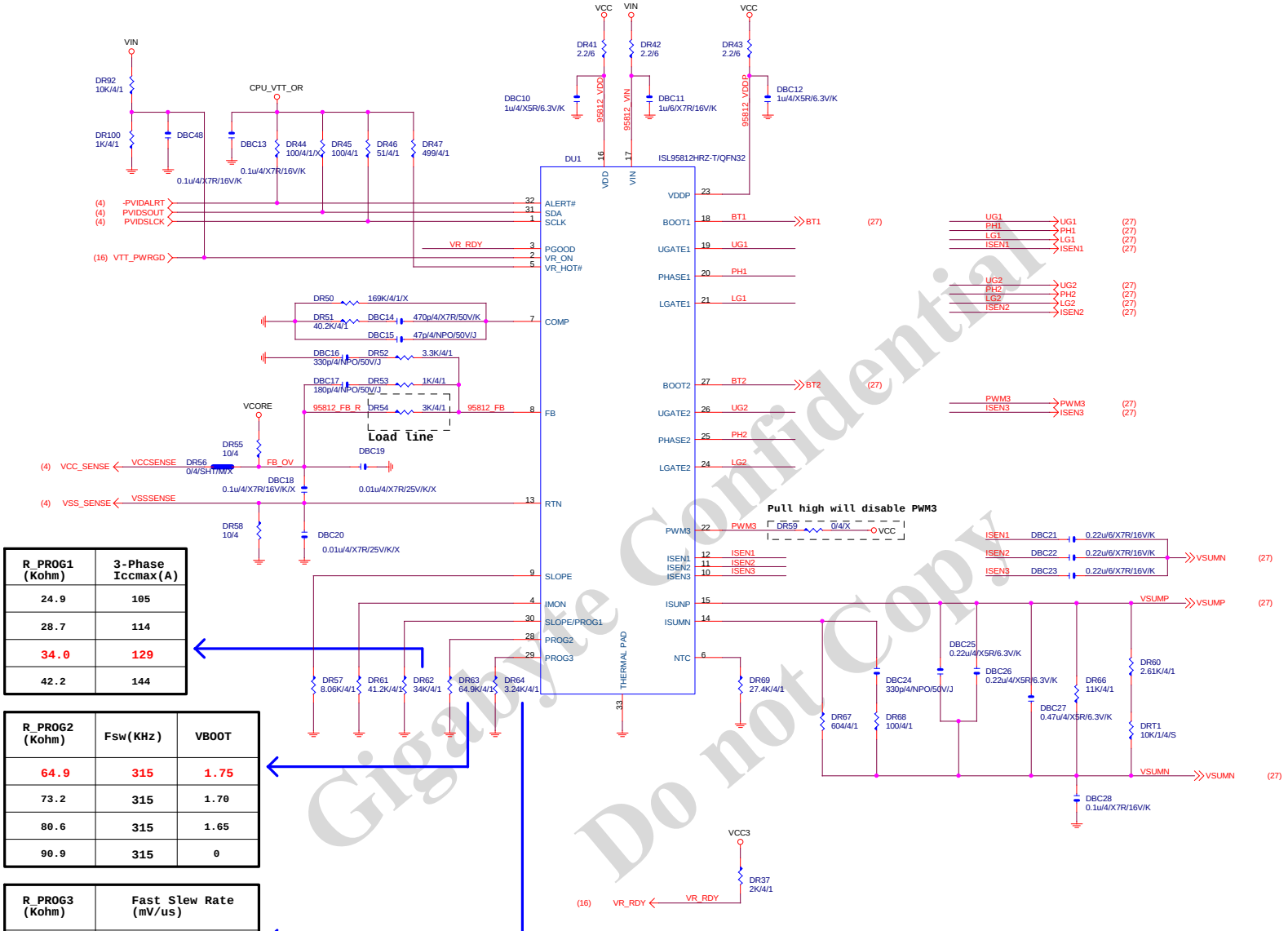
【技術通報R&D技術通報154】



FIX PWR MINMUN LOAD

Gigabyte Technology

Title	ATX CONNECTOR	
Size: Custom	Document Number: GA-H81M-H	Rev: 2.01
Date: Friday, July 04, 2014	Sheet 25 of 29	



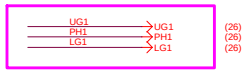
R_PROG1 (Kohm)	3-Phase Iccmax(A)
24.9	105
28.7	114
34.0	129
42.2	144

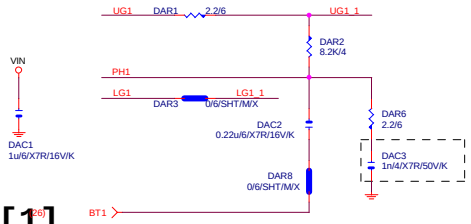
R_PROG2 (Kohm)	Fsw(KHz)	VBOOT
64.9	315	1.75
73.2	315	1.70
80.6	315	1.65
90.9	315	0

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

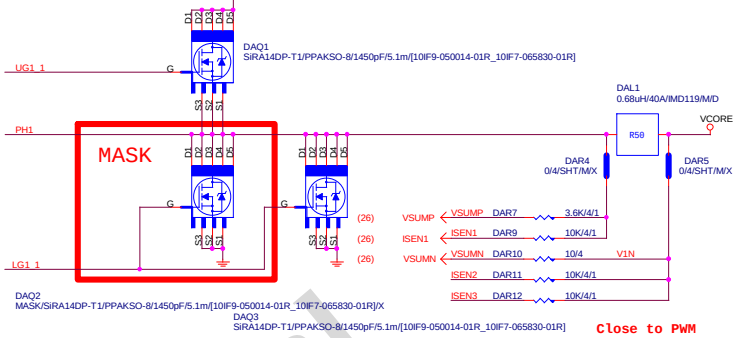
Gigabyte Technology			
Title: CPU CORE VR-1			
Size: Custom	Document Number: GA-H81M-H		Rev: 2.01
Date: Friday, July 04, 2014	Sheet 26 of 29		

PHASE 1



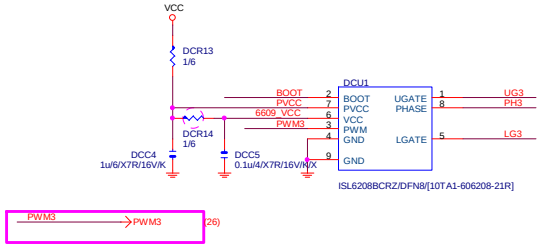


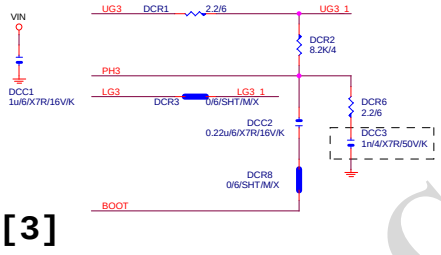
[1]



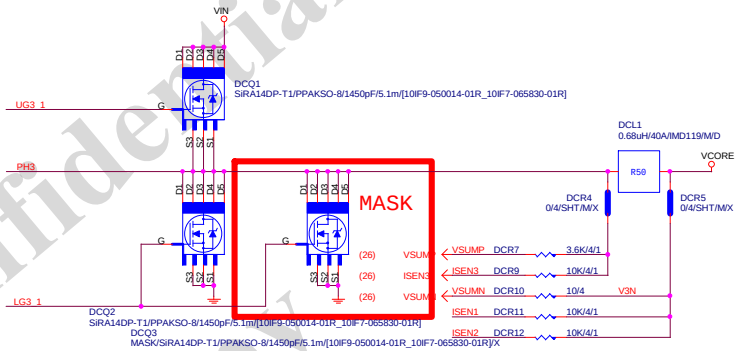
Close to PWM

PHASE 3



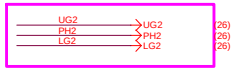


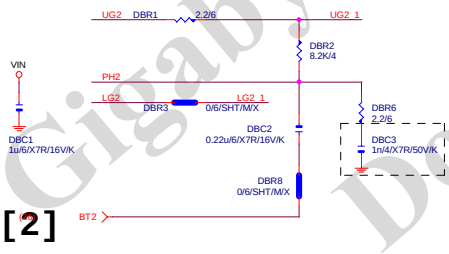
[3]



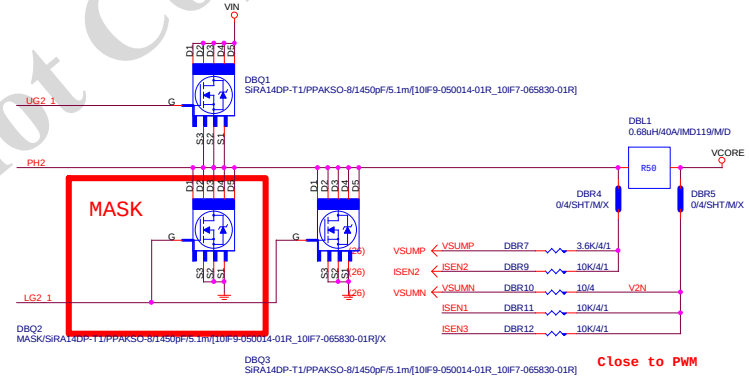
Close to PWM

PHASE 2

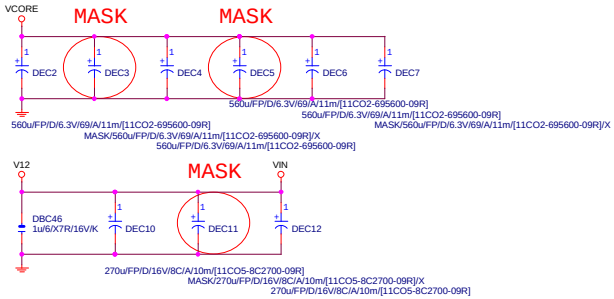




[2]

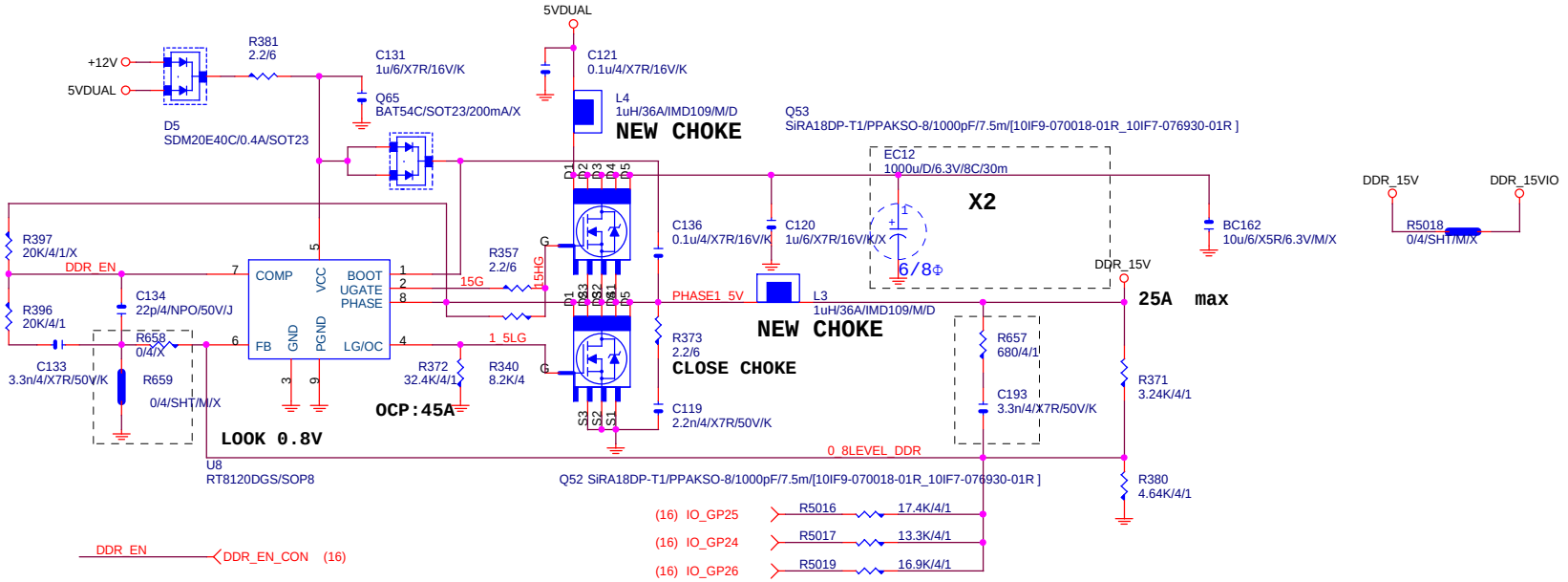


Close to PWM



Gigabyte Technology		
Title: CPU CORE VR-2		
Size: Custom	Document Number: GA-H81M-H	Rev: 2.01
Date: Friday, July 04, 2014	Sheet 27 of 29	

DDR15V



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

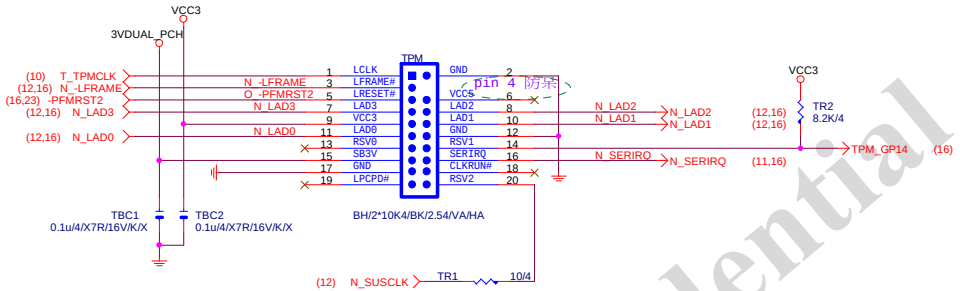
560u/FP/D/6.3V/68/8m RIPPLE CURRENT=4.7A
Coefficient=1.7(85℃),1(105℃)

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

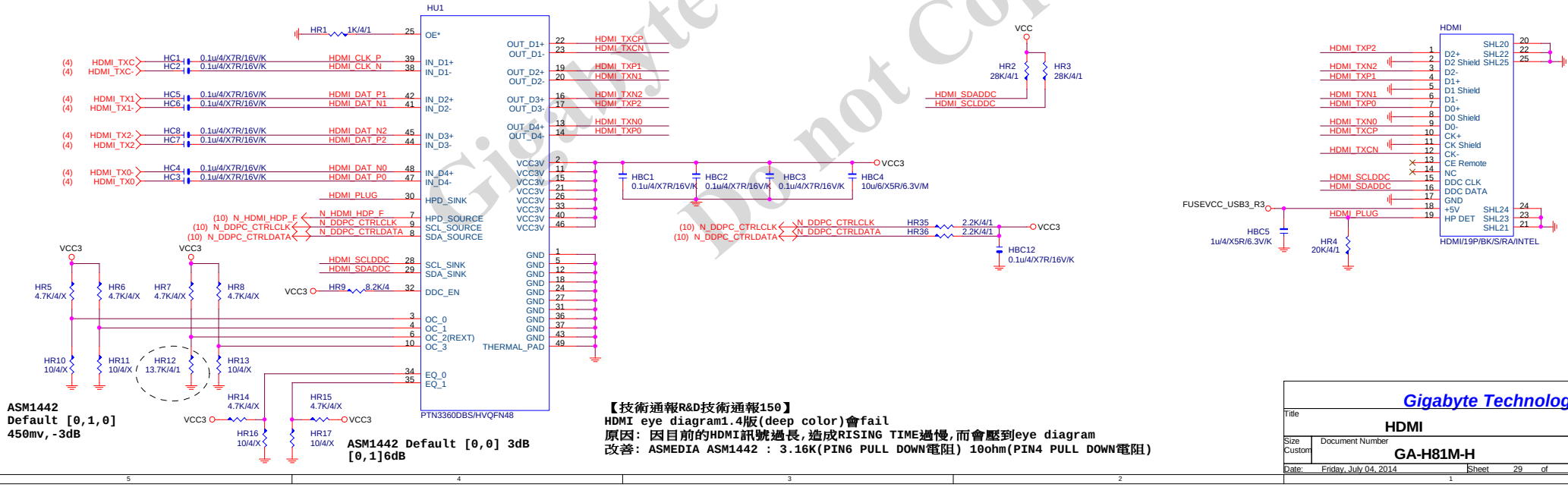
Gigabyte Technology			
Title: DDR POWER			
Size: Custom	Document Number: GA-H81M-H		Rev: 2.01
Date: Friday, July 04, 2014	Sheet 28 of 29		

TPM CONNECT



HDMI LEVEL SHIFT

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



ASM1442
Default [0,1,0]
450mv,-3dB

ASM1442 Default [0,0] 3dB
[0,1]6dB

【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: 2.01

Date: Friday, July 04, 2014 | Sheet 29 of 29