Model Name: GA-B85M-D3H

Revision 2.1

SHEET	TITLE
01	COVER SHEET
02	BOM & PCB MODIFY HISTORY
03	BLOCK DIAGRAM
04	CPU_LGA1150-A
05	CPU_LGA1150-B
06	CPU_LGA1150-C
07	DDR III CHANNEL A 1,2
08	DDR III CHANNEL B 1,2
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*4 SLOT
16	PCI SLOT1,2
17	ITE 8620 LPC IO
18	COM,KB_MS_USB,USB30_20
19	HWM,FAN CTRL,OV,-PROCHOT
20	DUAL BIOS
21	FP,FUSB,SPK,SATALED
22	Realtek ALC892-GR
23	REAR AUDIO JACK
24	REALTEK RTL8111F
25	DISCRETE POWER
26	ATX ,TPM
27	VCORE ISL95812_1

SHEET	TITLE
28	VCORE ISL95812_2
29	RT8120_DDR POWER
30	LPT, M3 POWER
31	DVI, HDMI
32	IT8892E

Gigabyte Technology		
Title: Cover Sheet		
Size: Custom	Document Number: GA-B85M-D3H	Rev: 2.1
Date: Thursday, January 08, 2015	Sheet 1 of 32	

Model Name: GA-B85M-D3H

Revision 2.1

Component value change history

2014/2/20

Data	Change Item	Reason
2014.02.12	20A E-BOM release. PCB:2.0	Modify from H97M-D3H , 修改PWM(95812+6208B) , 並改為1上1下(3項)
2014.02.14	20A E-BOM release. PCB:2.0	E-BOM 變更 1.F_AUDIO CR58/CR54 22K/4 上件 2.OC18 / OC22 1u/4/x5r/6.3v/k 上件 3.HDMI Level shift NXP change to ASMEDIA
2014.03.24	20B E-BOM release. PCB:2.01	WBC20 上件 / 20A時的E-BOM變更 / PWM DR61 105K change to 41.2K(廠商建議) / FR1,FR2,FR3,R672,R673,R4,R403,R404,NR20,NR21,R313,R314,NR1,NR2,FR9,NR246 remove
2014.04.02	20C P-BOM release. PCB:2.01	OR49/OC27/RS3 不上件 (TR6)
2014.06.18	20D P-BOM release. PCB:2.02	a.SATA remove MLCC,修改方式為short pad + Mask b. EMI : add PEMC2 [3VDUAL] (0.01uF) ，BC164 [5VDUAL] (0.1u-->0.01uF) for FRONT_USB ESD
2014.10.14	20E P-BOM release. PCB:2.02	CEC1/CEC2/CEC10/CEC11/CEC12/CEC13/CEC14/CEC15/CEC9/CEC6 change to "100uF/D/10V/6*5/[11CE2-651000-05R] "(金色電容)
2014.11.11	20F P-BOM release. PCB:2.02	a. All of INTEL 8/9 series 請發BOM 修改, 預防 SPEAKER 嗶嗶叫 Issue DR100 1K-->3.3K/4/1 (for SIO 8620) b.0.1u/Y5V/16V change to 0.1u/X7R/16V (16pcs, total 0.1u/X7R/16V 102pcs)
2015.01.08	21A P-BOM release. PCB:2.1	Modify from Rev2.02 to Rev2.1

Circuit or PCB layout change

DATE	Change Item	Reason
2014.02.20	20 release. PCB:2.0	1. modify from H97M-D3H to B85M-D3H 2. PWM change to ISL95812+ISL6208 3. FUSE change 2.6A , not support 1 port 1fuse & 3X power 4. SATA3*4 , SATA2*2 5.USB3.0*4
2014.03.24	20 release. PCB:2.01	PCB 243.84*215
2014.06.19	20 release. PCB:2.02	1.SATA / SATA Express remove MLCC,修改方式為short pad + Mask
2015.01.08	21 release. PCB:2.1	修改文字面Rev2.02 to Rev2.1

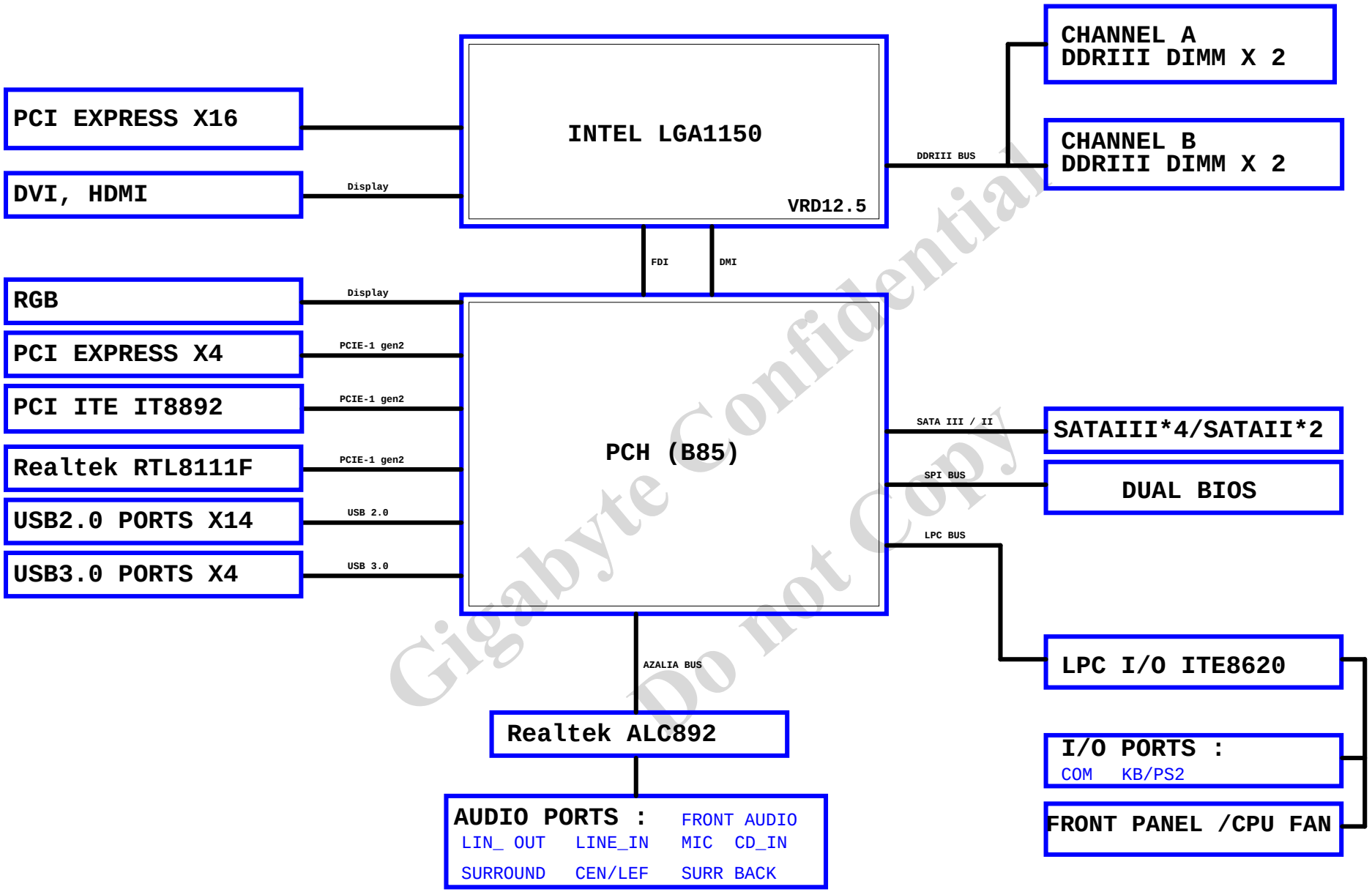
Gigabyte Technology

Title: BOM & PCB MODIFY HISTORY

Size: Custom | Document Number: GA-B85M-D3H | Rev: 2.1

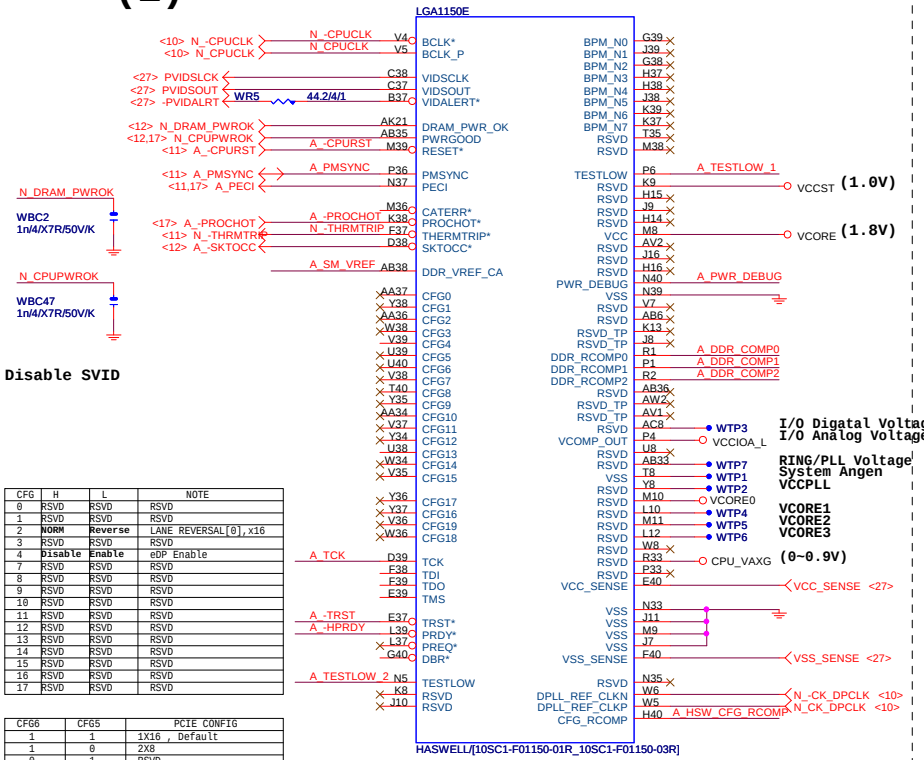
Date: Thursday, January 08, 2015 | Sheet 2 of 32

BLOCK DIAGRAM



Gigabyte Technology		
Title: BLOCK DIAGRAM		
Size: C	Document Number: GA-B85M-D3H	Rev: 2.1
Date: Thursday, January 08, 2015	Sheet 3 of 32	

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

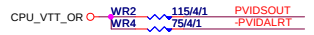
LGA1155 (C)

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

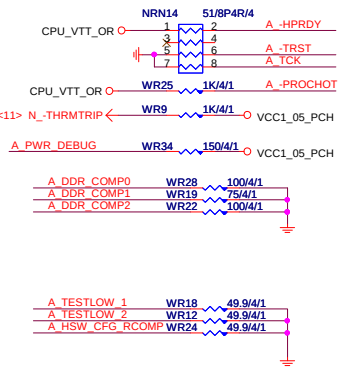
DMI:12/4/4/4/12(breakout min 8/4/4/4/8)
Impedance=85 +- 17.5%

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

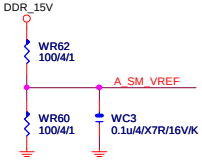
CPU SVID



CPU PU/PD

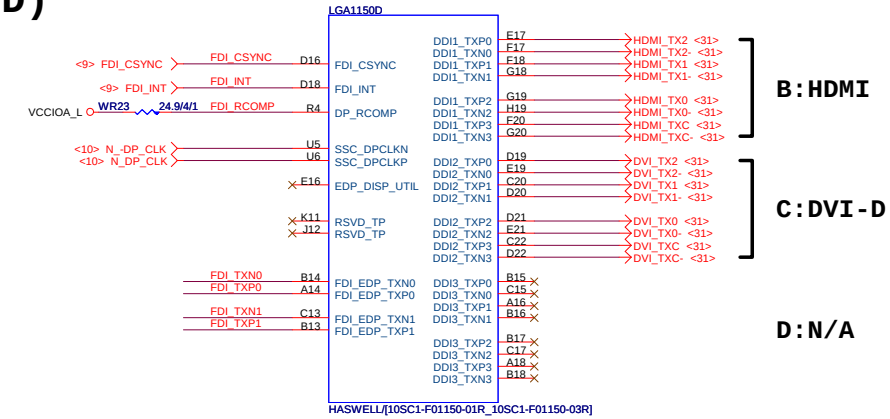


SM REF



LGA1150 (D)

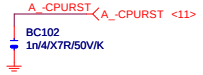
DVI-I + HDMI組態就是: DVI-I port B, HDMI port C
DVI-D + HDMI組態就是: DVI-D port C, HDMI port B



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

FDI_TXP[0..1] FDI_TXP[0..1] <9>
FDI_TXN[0..1] FDI_TXN[0..1] <9>

-CPURST

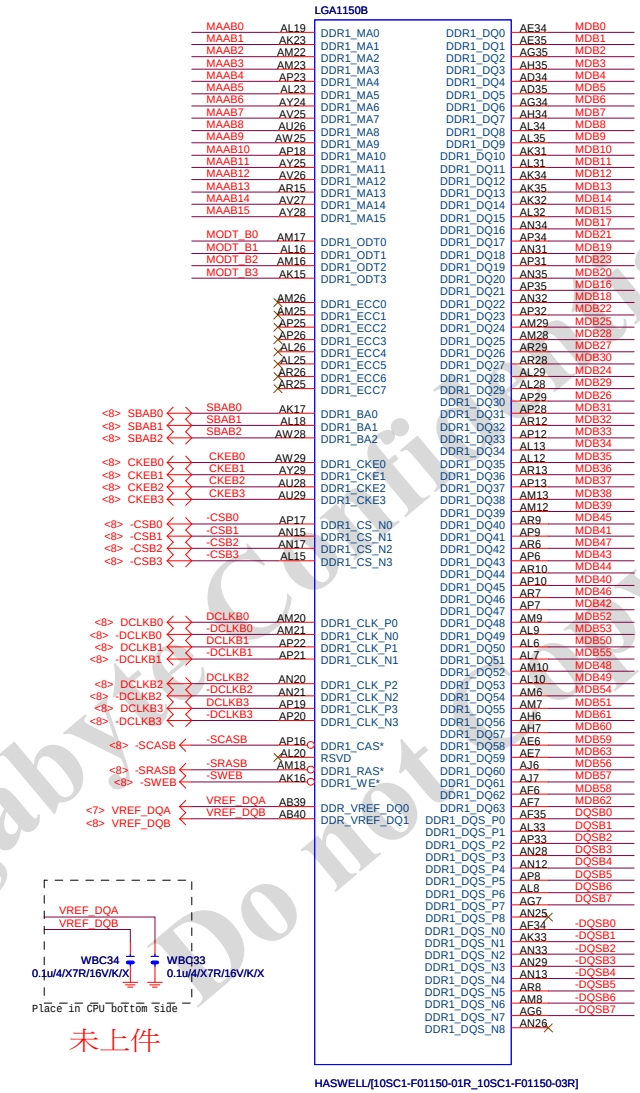


THRMTRIP DISABLE

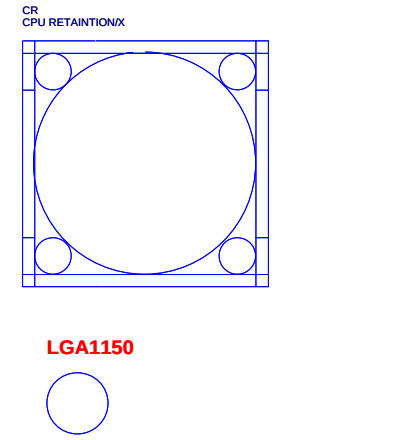
Gigabyte Technology			
Title: CPU LGA1150-A			
Size: Custom	Document Number: GA-B85M-D3H		Rev: 2.1
Date: Thursday, January 08, 2015	Sheet 4 of 32		

LGA1150 (A)

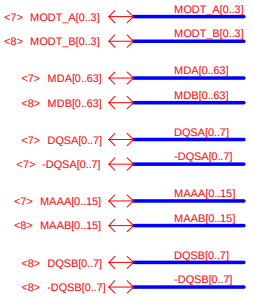
LGA1150 (B)



LGA1150 (CR)

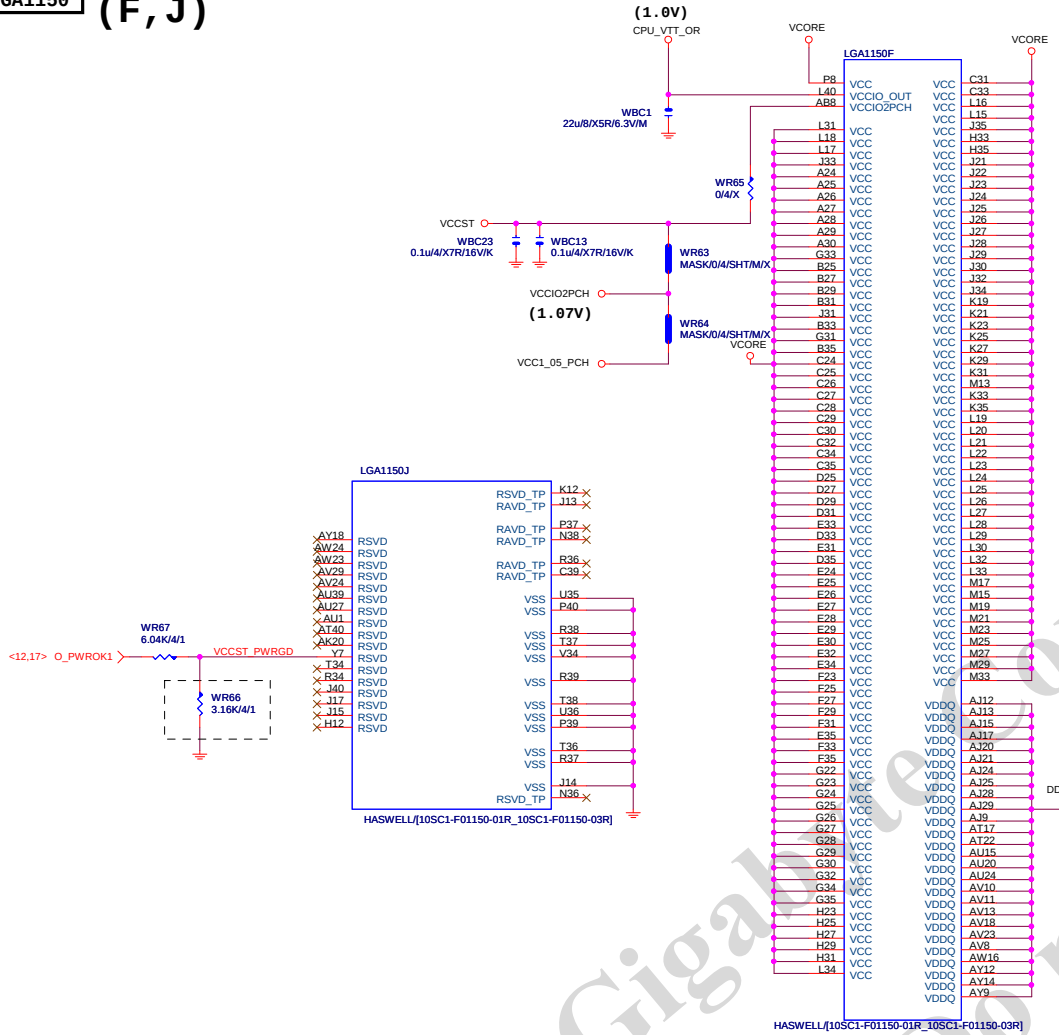


DDR BUS

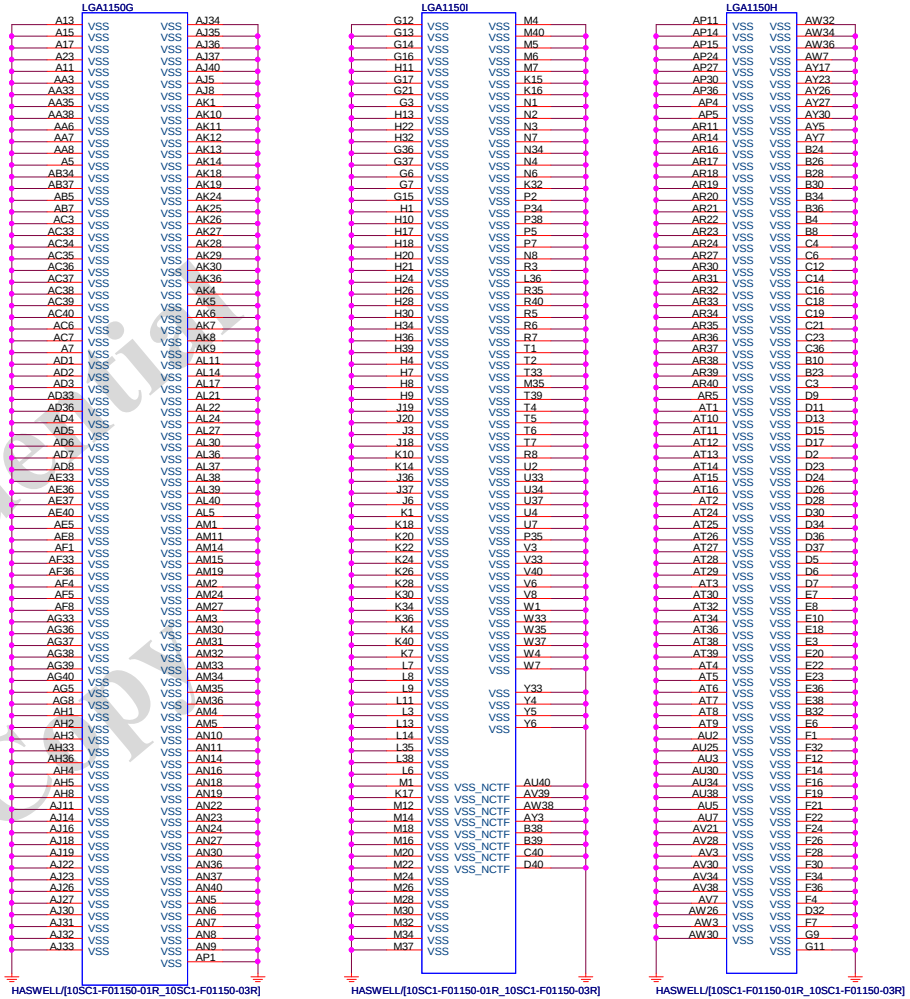


Gigabyte Technology			
Title: CPU LGA1150-B			
Size: Custom	Document Number: GA-B85M-D3H		Rev: 2.1
Date: Thursday, January 08, 2015	Sheet 5 of 32		

LGA1150 (F,J)

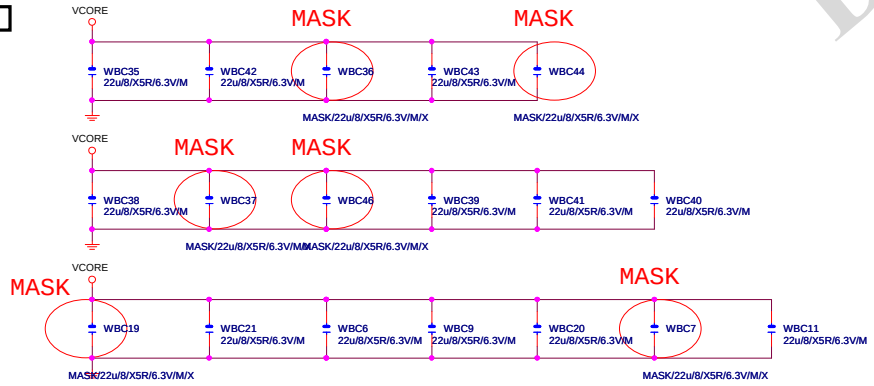


LGA1155 (G,H,I)



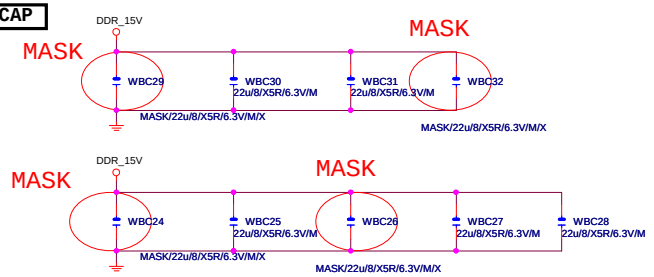
VCore CAP

(X18)



DDR CAP

(X9)



Gigabyte Technology			
Title: CPU LGA1150-C			
Size: Custom	Document Number: GA-B85M-D3H		Rev: 2.1
Date: Thursday, January 08, 2015	Sheet 6 of 32		

DDR3 (A)

DDR3_4

DDRVTT
VTT
VDD
VSS
RSVD
ODT1
ODT0
NC/PAR_IN
NC/ERR_OUT
NC/TEST4
CB0
CB1
CB2
CB3
CB4
CB5
CB6
CB7
DQS0
DQS0*
DQS1
DQS1*
DQS2
DQS2*
DQS3
DQS3*
DQS4
DQS4*
DQS5
DQS5*
DQS6
DQS6*
DQS7
DQS7*
DQS8
DQS8*
DM0/DQS9
NC/DQS9*
DM1/DQS10
NC/DQS10*
DM2/DQS11
NC/DQS11*
DM3/DQS12
NC/DQS12*
DM4/DQS13
NC/DQS13*
DM5/DQS14
NC/DQS14*
DM6/DQS15
NC/DQS15*
DM7/DQS16
NC/DQS16*
DM8/DQS17
NC/DQS17*
DQ0
DQ1
DQ2
DQ3
DQ4
DQ5
DQ6
DQ7
DQ8
DQ9
DQ10
DQ11
DQ12
DQ13
DQ14
DQ15
DQ16
DQ17
DQ18
DQ19
DQ20
DQ21
DQ22
DQ23
DQ24
DQ25
DQ26
DQ27
DQ28
DQ29
DQ30
DQ31
DQ32
DQ33
DQ34
DQ35
DQ36
DQ37
DQ38
DQ39
DQ40
DQ41
DQ42
DQ43
DQ44
DQ45
DQ46
DQ47
DQ48
DQ49
DQ50
DQ51
DQ52
DQ53
DQ54
DQ55
DQ56
DQ57
DQ58
DQ59
DQ60
DQ61
DQ62
DQ63
FREE

MODT_A[0..3] <5>
-DQSA[0..7] <5>
DQSA[0..7] <5>
MDA[0..63] <5>

-DDR3_RST
MC6 100p/4/NPO/50V/J
DDR_15V
N_SMBDATA
N_SMBCLK
MC10 100p/4/NPO/50V/J/X
MC11 100p/4/NPO/50V/J/X
VCC3
VDDSPD
MF1 SPR-P200T/6V/8/S
MC4 0.1u/4/X7R/16V/K/X
MC5 0.1u/4/X7R/16V/K/X
MC1 0.1u/4/X7R/16V/K/X
未上件
VREF_DDRA
VREF_DQDDRA
VREFCA
VREFDQ
<8,12,14,15,16,19> N_SMBCLK
<8,12,14,15,16,19> N_SMBDATA
SCL
SDA
SA0
SA1
<5> SBAA2
<5> SBAA1
<5> SBAA0
BA2
BA1
BA0
<5> CKEA1
<5> CKEA0
CKE1
CKE0
<5> -CSA1
<5> -CSA0
S1*
S0*
<5> -DCLKA1
<5> DCLKA1
CK1/NU*
CK1/NU
<5> -DCLKA0
<5> 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*

DDR3/240/BK/VA/D
BLACK CONNECTOR

DDR3_2

DDR3/240/GR/VA/D
GRAY CONNECTOR

DDR3_VREF

DDR_15V
MR15 1K/4/1
MR14 1K/4/1
MR4 1K/4/1
MR5 1K/4/1
VREF_DDRA
VREF_DQDDRA
VREF_DQA <5>

DDR15V Decouple
MEC1 560u/FPD/6.3V/69/A/11m[11CO2-695600-09R]
MEC2 560u/FPD/6.3V/69/A/11m[11CO2-695600-09R]
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-B85M-D3H
Rev: 2.1
Date:
Sheet 7 of 32

DDR3 (B)

DDR3_3

DDRVTT

VTT VTT

VSS

FREE FREE FREE 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

DQS1 DQS1* → DQSB1 -DQSB1

DQS2 DQS2* → DQSB2 -DQSB2

DQS3 DQS3* → DQSB3 -DQSB3

DQS4 DQS4* → DQSB4 -DQSB4

DQS5 DQS5* → DQSB5 -DQSB5

DQS6 DQS6* → DQSB6 -DQSB6

DQS7 DQS7* → DQSB7 -DQSB7

DQS8 DQS8*

DM0/DQS9 NC/DQS9*

DM1/DQS10 NC/DQS10*

DM2/DQS11 NC/DQS11*

DM3/DQS12 NC/DQS12*

DM4/DQS13 NC/DQS13*

DM5/DQS14 NC/DQS14*

DM6/DQS15 NC/DQS15*

DM7/DQS16 NC/DQS16*

DM8/DQS17 NC/DQS17*

-DQSB[0..7] <5>

DQSB[0..7] <5>

MODT_B[0..3] <5>

DDR_15V

VDD

DQ0 DQ1 DQ2 DQ3 DQ4 DQ5 DQ6 DQ7 DQ8 DQ9 DQ10 DQ11 DQ12 DQ13 DQ14 DQ15 DQ16 DQ17 DQ18 DQ19 DQ20 DQ21 DQ22 DQ23 DQ24 DQ25 DQ26 DQ27 DQ28 DQ29 DQ30 DQ31 DQ32 DQ33 DQ34 DQ35 DQ36 DQ37 DQ38 DQ39 DQ40 DQ41 DQ42 DQ43 DQ44 DQ45 DQ46 DQ47 DQ48 DQ49 DQ50 DQ51 DQ52 DQ53 DQ54 DQ55 DQ56 DQ57 DQ58 DQ59 DQ60 DQ61 DQ62 DQ63 → MDB0 MDB1 MDB2 MDB3 MDB4 MDB5 MDB6 MDB7 MDB8 MDB9 MDB10 MDB11 MDB12 MDB13 MDB14 MDB15 MDB16 MDB17 MDB18 MDB19 MDB20 MDB21 MDB22 MDB23 MDB24 MDB25 MDB26 MDB27 MDB28 MDB29 MDB30 MDB31 MDB32 MDB33 MDB34 MDB35 MDB36 MDB37 MDB38 MDB39 MDB40 MDB41 MDB42 MDB43 MDB44 MDB45 MDB46 MDB47 MDB48 MDB49 MDB50 MDB51 MDB52 MDB53 MDB54 MDB55 MDB56 MDB57 MDB58 MDB59 MDB60 MDB61 MDB62 MDB63

MDB[0..63] <5>

未上件

MC2 0.1u/4/X7R/16V/K/X

VDDSPD

MC14 0.1u/4/X7R/16V/K/X VREF_DDRB

MC9 0.1u/4/X7R/16V/K/X VREF_DQDDRB

VREFCA VREFDQ

<7,12,14,15,16,19> N_SMBCLK

<7,12,14,15,16,19> N_SMBDATA

SCL SDA SA1 SA0

<5> SBAB2 <5> SBAB1 <5> SBAB0 → BA2 BA1 BA0

<5> CKEB1 <5> CKEB0 → CKE1 CKE0

<5> -CSB1 <5> -CSB0 → S1* S0*

<5> -DCLKB1 <5> DCLKB1 → CK1/NU* CK1/NU

<5> -DCLKB0 <5> DCLKB0 → CK0* CK0

<5> MAAB[0..15] → A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 A10/AP A11 A12 A13 A14 A15

<5,7> -DDR3_RST

<5> -SCASB <5> -SRASB <5> -SWEB → RESET* CAS* RAS* WE*

DDR3/240/BK/VA/D

BLACK CONNECTOR

DDR3_1

DDRVTT

VTT VTT

VSS

FREE FREE FREE FREE

RSVD

ODT1 ODT0 → MODT_B3 MODT_B2

NC/PAR_IN NC/ERR_OUT NC/TEST4

CB0 CB1 CB2 CB3 CB4 CB5 CB6 CB7

DQS0 DQS0* → DQSB0 -DQSB0

DQS1 DQS1* → DQSB1 -DQSB1

DQS2 DQS2* → DQSB2 -DQSB2

DQS3 DQS3* → DQSB3 -DQSB3

DQS4 DQS4* → DQSB4 -DQSB4

DQS5 DQS5* → DQSB5 -DQSB5

DQS6 DQS6* → DQSB6 -DQSB6

DQS7 DQS7* → DQSB7 -DQSB7

DQS8 DQS8*

DM0/DQS9 NC/DQS9*

DM1/DQS10 NC/DQS10*

DM2/DQS11 NC/DQS11*

DM3/DQS12 NC/DQS12*

DM4/DQS13 NC/DQS13*

DM5/DQS14 NC/DQS14*

DM6/DQS15 NC/DQS15*

DM7/DQS16 NC/DQS16*

DM8/DQS17 NC/DQS17*

DDR_15V

VDD

DQ0 DQ1 DQ2 DQ3 DQ4 DQ5 DQ6 DQ7 DQ8 DQ9 DQ10 DQ11 DQ12 DQ13 DQ14 DQ15 DQ16 DQ17 DQ18 DQ19 DQ20 DQ21 DQ22 DQ23 DQ24 DQ25 DQ26 DQ27 DQ28 DQ29 DQ30 DQ31 DQ32 DQ33 DQ34 DQ35 DQ36 DQ37 DQ38 DQ39 DQ40 DQ41 DQ42 DQ43 DQ44 DQ45 DQ46 DQ47 DQ48 DQ49 DQ50 DQ51 DQ52 DQ53 DQ54 DQ55 DQ56 DQ57 DQ58 DQ59 DQ60 DQ61 DQ62 DQ63 → MDB0 MDB1 MDB2 MDB3 MDB4 MDB5 MDB6 MDB7 MDB8 MDB9 MDB10 MDB11 MDB12 MDB13 MDB14 MDB15 MDB16 MDB17 MDB18 MDB19 MDB20 MDB21 MDB22 MDB23 MDB24 MDB25 MDB26 MDB27 MDB28 MDB29 MDB30 MDB31 MDB32 MDB33 MDB34 MDB35 MDB36 MDB37 MDB38 MDB39 MDB40 MDB41 MDB42 MDB43 MDB44 MDB45 MDB46 MDB47 MDB48 MDB49 MDB50 MDB51 MDB52 MDB53 MDB54 MDB55 MDB56 MDB57 MDB58 MDB59 MDB60 MDB61 MDB62 MDB63

MDB[0..63] <5>

未上件

MC12 0.1u/4/X7R/16V/K/X

VDDSPD

MC15 0.1u/4/X7R/16V/K/X VREF_DDRB

MC13 0.1u/4/X7R/16V/K/X VREF_DQDDRB

VREFCA VREFDQ

<7,12,14,15,16,19> N_SMBCLK

<7,12,14,15,16,19> N_SMBDATA

SCL SDA SA1 SA0

<5> SBAB2 <5> SBAB1 <5> SBAB0 → BA2 BA1 BA0

<5> CKEB3 <5> CKEB2 → CKE1 CKE0

<5> -CSB3 <5> -CSB2 → S1* S0*

<5> -DCLKB3 <5> DCLKB3 → CK1/NU* CK1/NU

<5> -DCLKB2 <5> DCLKB2 → CK0* CK0

<5> MAAB[0..15] → A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 A10/AP A11 A12 A13 A14 A15

<5,7> -DDR3_RST

<5> -SCASB <5> -SRASB <5> -SWEB → RESET* CAS* RAS* WE*

DDR3/240/GR/VA/D

GRAY CONNECTOR

DDR3_VREF

DDR_15V DDR_15V

MR10 1K/4/1 MR8 1K/4/1

VREF_DDRB VREF_DQDDRB → VREF_DQB <5>

MR11 1K/4/1 MR9 1K/4/1

COUPON

COUPON1 COUPON1 1 2 COUPON/X

COUPON2 COUPON2 1 2 COUPON/X

CPU

DIMM4 (黑)

DIMM2 (灰)

CHA

DIMM3 (黑)

DIMM1 (灰)

CHB

Gigabyte Technology

Title: DDRIII CHANNEL B

Size: Custom | Document Number: GA-B85M-D3H | Rev: 2.1

Date: | Sheet 8 of 32

PORT1,PORT9[DEBUG PORT]FOR WHQL 一定要拉出PORT

PCH (B)

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

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

PCHB

A_DMI_0TXN L24
A_DMI_0TXP K24
A_DMI_0RXN C20
A_DMI_0RXP B20
A_DMI_1TXN G24
A_DMI_1TXP H24
A_DMI_1RXN D21
A_DMI_1RXP B21
A_DMI_2TXN F26
A_DMI_2TXP G26
A_DMI_2RXN B22
A_DMI_2RXP C22
A_DMI_3TXN K26
A_DMI_3TXP L26
A_DMI_3RXN A24
A_DMI_3RXP B24

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

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

DMI_RCOMP
PCIE_RCOMP

<10> CK_-SRCCLK_PCH → CK_SRCCLK_PCH G22
<10> CK_SRCCLK_PCH → CK_SRCCLK_PCH F22

CLKIN_DMI_N
CLKIN_DMI_P

USB:
USBN_0 AV10 N_-USBP0 → N_-USBP0 <21>
USBP_0 AU10 N_+USBP0 → N_+USBP0 <21>
USBN_1 AV11 N_-USBP1 → N_-USBP1 <21>
USBP_1 AW11 N_+USBP1 → N_+USBP1 <21>
USBN_2 AN14 N_-USBP2 → N_-USBP2 <24>
USBP_2 AP14 N_+USBP2 → N_+USBP2 <24>
USBN_3 AJ16 N_-USBP3 → N_-USBP3 <24>
USBP_3 AK16 N_+USBP3 → N_+USBP3 <24>
USBN_4 AU15 N_-USBP4 → N_-USBP4 <18>
USBP_4 AV15 N_+USBP4 → N_+USBP4 <18>
USBN_5 AU12 N_-USBP5 → N_-USBP5 <18>
USBP_5 AT12 N_+USBP5 → N_+USBP5 <18>
USBN_6 AV14
USBP_6 AW14
USBN_7 AU17
USBP_7 AT17
USBN_8 AW16 N_-USBP8 → N_-USBP8 <21>
USBP_8 AV16 N_+USBP8 → N_+USBP8 <21>
USBN_9 AN16 N_-USBP9 → N_-USBP9 <21>
USBP_9 AP16 N_+USBP9 → N_+USBP9 <21>
USBN_10 AJ18 N_-USBP10 → N_-USBP10 <18>
USBP_10 AK18 N_+USBP10 → N_+USBP10 <18>
USBN_11 AP18 N_-USBP11 → N_-USBP11 <18>
USBP_11 AN18 N_+USBP11 → N_+USBP11 <18>
USBN_12 AW18 N_-USBP12 → N_-USBP12 <21>
USBP_12 AV18 N_+USBP12 → N_+USBP12 <21>
USBN_13 AP20 N_-USBP13 → N_-USBP13 <21>
USBP_13 AN20 N_+USBP13 → N_+USBP13 <21>

USB2.0/3.0 PORT要對應

PCIE:
PCIE_PERN_1_USB3_RXN_2 L14
PCIE_PERP_1_USB3_RXP_2 K14
PCIE_PETN_1_USB3_TXN_2 B12
PCIE_PETP_1_USB3_TXP_2 B11
PCIE_PERN_2_USB3_RXN_3 F14
PCIE_PERP_2_USB3_RXP_3 G14
PCIE_PETN_2_USB3_TXN_3 D11
PCIE_PETP_2_USB3_TXP_3 C11
PCIE_PERN_3 F11
PCIE_PERP_3 H11
PCIE_PETN_3 B9
PCIE_PETP_3 A9
PCIE_PERN_4 J11
PCIE_PERP_4 L11
PCIE_PETN_4 B8
PCIE_PETP_4 C8
PCIE_PERN_5 G9
PCIE_PERP_5 F9
PCIE_PETN_5 B7
PCIE_PETP_5 A7
PCIE_PERN_6 F7
PCIE_PERP_6 H7
PCIE_PETN_6 E1
PCIE_PETP_6 D2
PCIE_PERN_7 K6
PCIE_PERP_7 K8
PCIE_PETN_7 G3
PCIE_PETP_7 G5
PCIE_PERN_8 J2
PCIE_PERP_8 J3
PCIE_PETN_8 H2
PCIE_PETP_8 H1

OC0B_GP59 AE40 → N_-USBOC_F <18,21>
OC1B_GP40 AF37
OC2B_GP41 AD39
OC3B_GP42 AD40
OC4B_GP43 AF39
OC5B_GP9 AC41 → N_-USBOC_R <18>
OC6B_GP10 AF40
OC7B_GP14 AG40 N_GPIO14

USBRBIASB AV20 N_USBRBIAS NR47 22.6/4/1
USBRBIAS AU20
W=4 mil out of PCH
S=15 mil out of PCH

CLKIN_DOT96N AP11 CK_-DOTCLK
CLKIN_DOT96P AM11 CK_DOTCLK

NR130 8.2K/4
N_GPIO14 — 3VDUAL

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

8111F
<24> LA_ML_IN H11
<24> LA_ML_IP B9
<24> LA_ML_ON A9
<24> LA_ML_OP J11

8892
<32> G_PCIEBIN L11
<32> G_PCIEBIP B8
<32> G_PCIEBON C8
<32> G_PCIEBOP G9

PCIEx4
<15> PP_EXP_RXN0 F9
<15> PP_EXP_RXP0 B7
<15> PP_EXP_TXN0 A7
<15> PP_EXP_TXP0 F7
<15> PP_EXP_RXN1 H7
<15> PP_EXP_RXP1 E1
<15> PP_EXP_TXN1 D2
<15> PP_EXP_TXP1 K6
<15> PP_EXP_RXN2 K8
<15> PP_EXP_RXP2 G3
<15> PP_EXP_TXN2 G5
<15> PP_EXP_TXP2 J2
<15> PP_EXP_RXN3 J3
<15> PP_EXP_RXP3 H2
<15> PP_EXP_TXN3 H1
<15> PP_EXP_TXP3

電容放靠近 Device & PCI-E Slot

DH82B85/S/[10HB1-030B85-20R]

PCIEX1:15/4/4/4/15 (breakout min 8/4/4/4/8)
Impedance=85 +- 17.5%

PCH (F)

PCHF

USB3 / FDILINK

<21> PCH_USB3_RXN0 F20 → USB3_RXN_0 / FDI_RXN_0
<21> PCH_USB3_RXP0 G20 → USB3_RXP_0 / FDI_RXP_0
<21> PCH_USB3_TXN0 B18 → USB3_TXN_0 / FDI_RXN_1
<21> PCH_USB3_TXP0 C18 → USB3_TXP_0 / FDI_RXP_1
<21> PCH_USB3_RXN1 G18 → USB3_RXN_1
<21> PCH_USB3_RXP1 H18 → USB3_RXP_1 / FDI_CSYNC
<21> PCH_USB3_TXN1 B15 → USB3_TXN_1
<21> PCH_USB3_TXP1 B16 → USB3_TXP_1 / FDI_INT
<18> PCH_USB3_RXN4 K20 → USB3_RXN_4 / FDI_RCOMP
<18> PCH_USB3_RXP4 L20 → USB3_RXP_4
<18> PCH_USB3_TXN4 D15 → USB3_TXN_4
<18> PCH_USB3_TXP4 C15 → USB3_TXP_4
<18> PCH_USB3_RXN5 L18 → USB3_RXN_5
<18> PCH_USB3_RXP5 K18 → USB3_RXP_5
<18> PCH_USB3_TXN5 B14 → USB3_TXN_5
<18> PCH_USB3_TXP5 A14 → USB3_TXP_5

FDI_TXN0 N1
FDI_TXP0 N2
FDI_TXN1 P2
FDI_TXP1 P3
FDI_CSYNC L2 → FDI_CSYNC <4>
FDI_INT L3 → FDI_INT <4>
NR29 7.5K/4/1 K2 → VCC1_5_PCH

VCC3 — NR62 8.2K/4/X AK28
NR63 8.2K/4/X AT34
TACH6_GP70
TACH7_GP71

未上件

DH82B85/S/[10HB1-030B85-20R]

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

<10> N_PCHCLK14 → NRN168.2K/8P4R/4
CK_-DOTCLK
CK_DOTCLK

PCH (J)

PCH PCIE ,DMI 15/4/4/4//15
usb2.0 12/5/7/5//12
usb3.0 20/5/7/5//20

PCHJ

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

TP22 U11
TP23 U10
TP21 AJ14
TP20 AK14
TP14 K34
TP15 K33
TP12 AH24
TP10 L16
TP11 K16
TP9 AM34
TP3 R12
TP4 N12
TP1 L22
TP2 K22
TP5 R4
TP6 K5
TP7 P5
TP8 L5
VSS AC31
VSS AF3
VSS AV21

DH82B85/S/[10HB1-030B85-20R]

PCH H/S

SB_HEATSIN

PCH_HS
PCH_HS[12SP2-S04208-61R_12SP2-S04208-62R_12SP2-S04208-63R]

USB TABLE

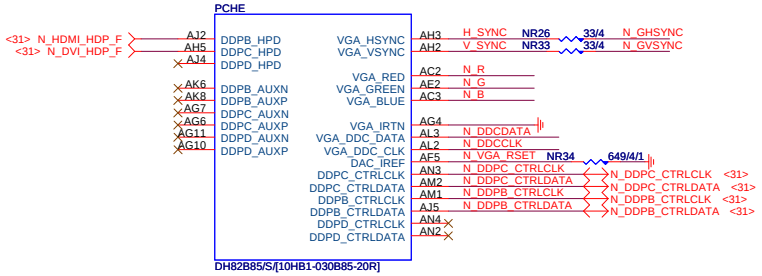
OC[3:0]# for Device 29 (ports 0-7)
OC[7:4]# for Device 26 (ports 8-13)

USB OC#	Configure
OC0#	F_USB30
OC1#	R_USB30
OC2#	USB30_LAN
OC3#	F_USB3
OC4#	F_USB2
OC5#	KB_MS_USB
OC6#	F_USB1
OC7#	Not Use

Gigabyte Technology

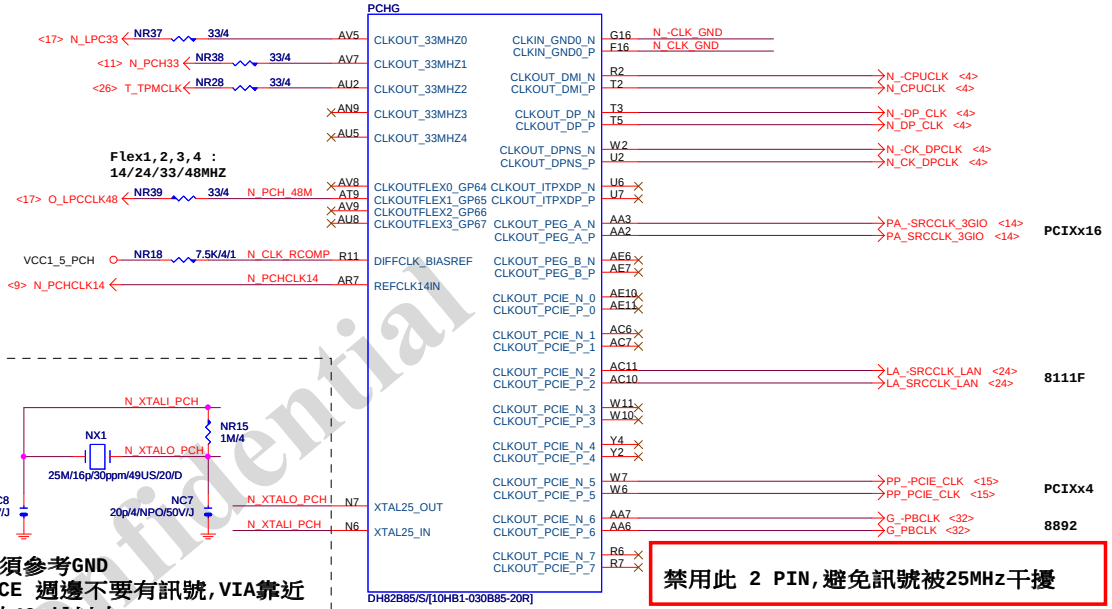
Title: PCH FDI,DMI,USB ,PCIE,NVRAM
Size: Custom | Document Number: GA-B85M-D3H | Rev: 2.1
Date: Thursday, January 08, 2015 | Sheet 9 of 32

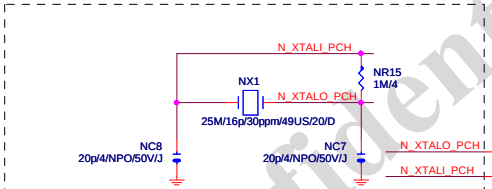
PCH (E)



VGA DISABLE
R,G,B NC OR GND
IRTN / IREF GND
VGA_HSYNC, VGA_VSYNC,DDC_CLK, DDC_DATA NC
POWER VCCADAC(AF2), VCCADACBG(AE1) GND

PCH (G)



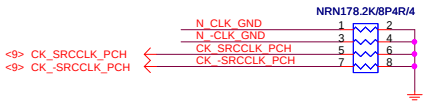


X'TAL 25MHz須參考GND
CRYSTAL/TRACE 週邊不要有訊號,VIA靠近
走線遠離其他40mil以上

禁用此 2 PIN,避免訊號被25MHz干擾

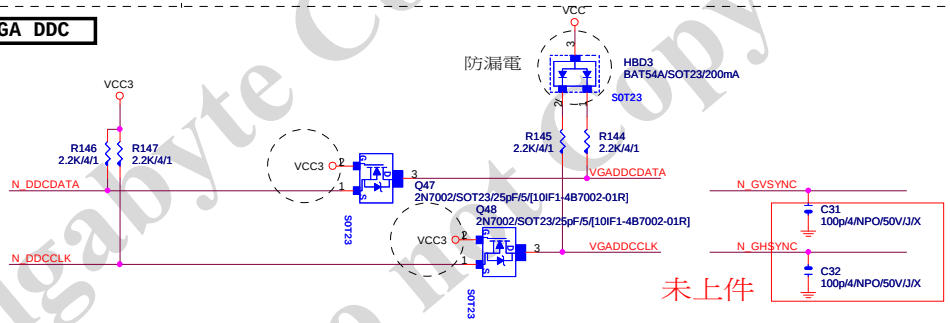
Differential Clock:18/4/6/4/18
Impedance=90 +- 15%

PCH CLK PD

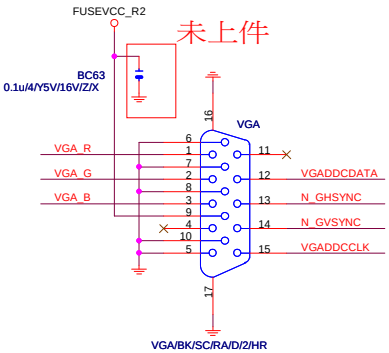


Mount for integrated clock Generation Mode

VGA DDC

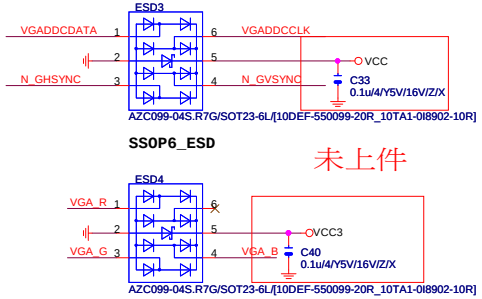


VGA CONNECTOR

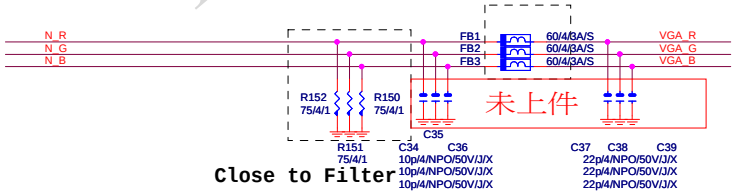


BLACK CONNECTOR

VGA ESD



VGA DDC



Close to Filter

Gigabyte Technology			
Title: PCH DISPLAY ,CLK BUFFER			
Size: Custom	Document Number: GA-B85M-D3H		Rev: 2.1
Date: Thursday, January 08, 2015	Sheet 10 of 32		

PCH (C)

H97 N/A

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%

PCHC

DH82B85/S/[10HB1-030B85-20R]

GPIO37 PU VCC3 ENABLE SBA
For H87&B85

PCH (A)

PCHA

DH82B85/S/[10HB1-030B85-20R]

PCH CLK PD

Mount for integrated clock Generation Mode

PCH PU/PD

SATA CONNECTOR

SATA3_0_1
SATA/14/WH/H/OP/RA/D/2

H81 Port 2/3 N/A

SATA3_2
SATA2/7/WH/H/OP/VA/D/1/B/PA66

SATA3_3
SATA2/7/WH/H/OP/VA/D/1/B/PA66

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

SATA2_0
SATA2/7/BK/H/OP/VA/D/1/B

SATA2_1
SATA2/7/BK/H/OP/VA/D/1/B

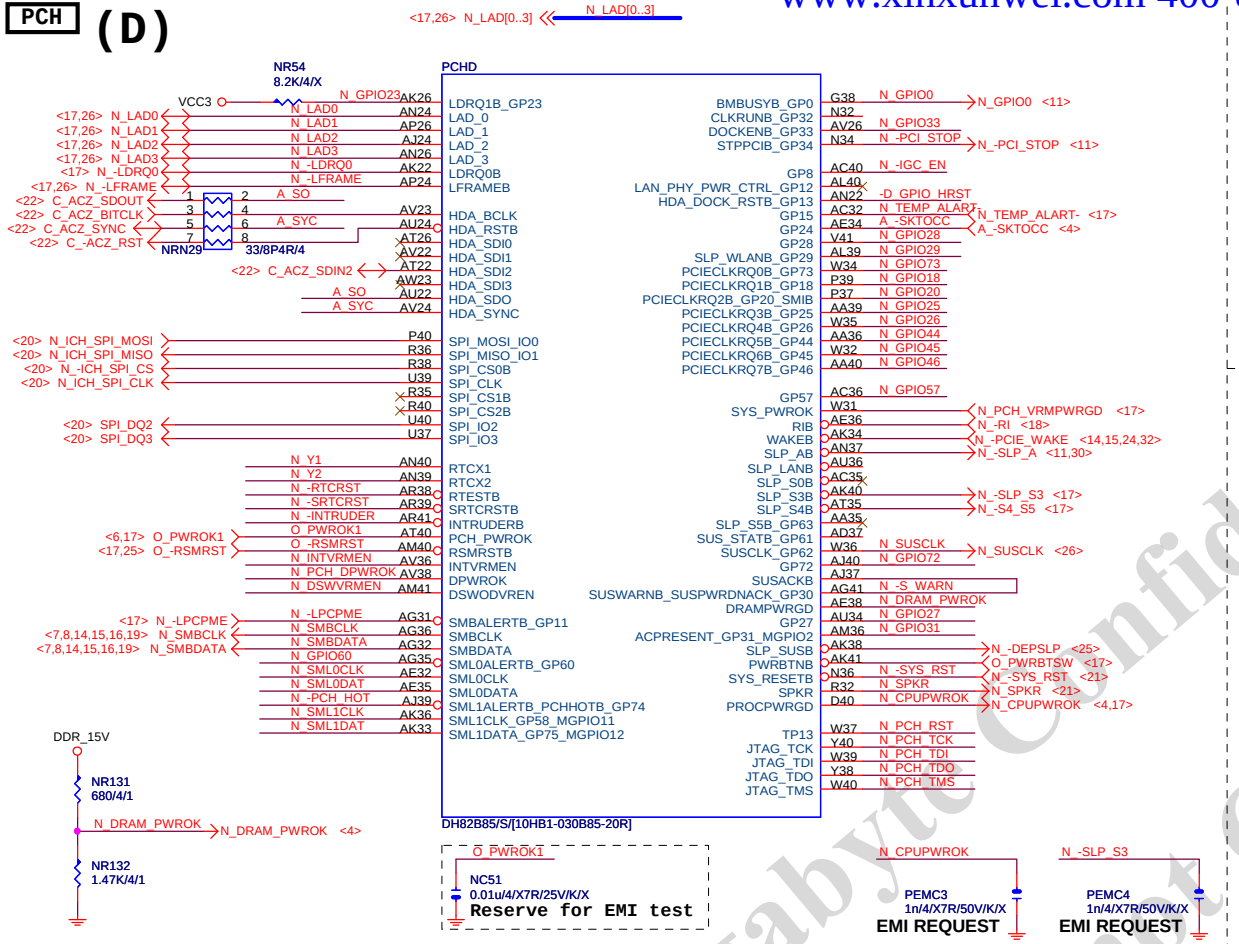
ME PWROK

Z97 N/A

GPIO38 Ctrl

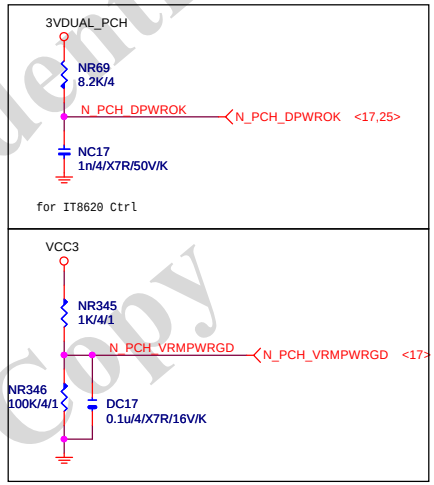
Gigabyte Technology	
Title	PCH HOST , SATA, PCI
Size: Custom	Document Number: GA-B85M-D3H
Rev	2.1
Date: Thursday, January 08, 2015	Sheet 11 of 32

PCH (D)

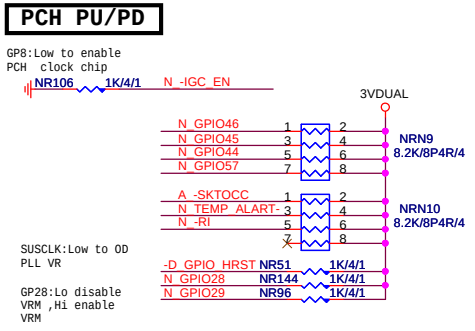


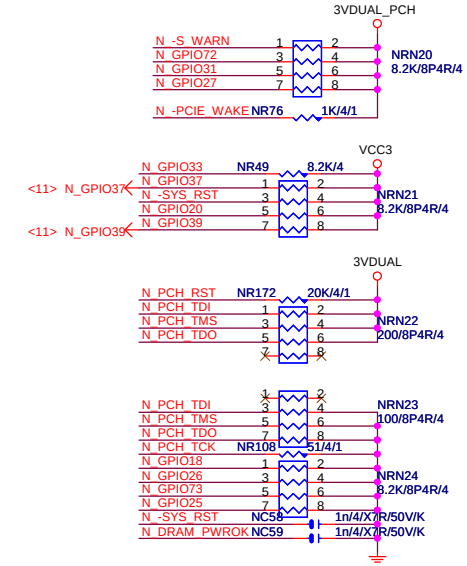
ACZ_SDOUT

PCH_DPWROK



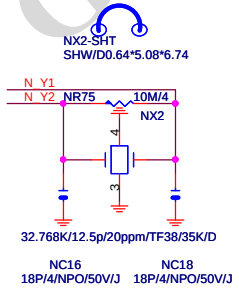
PCH_PU/PD



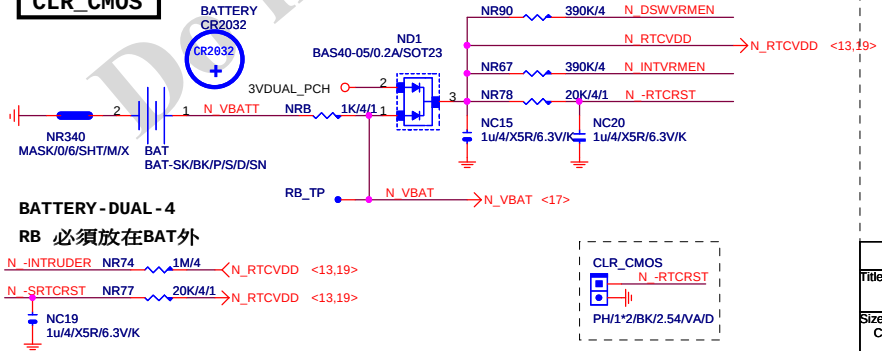


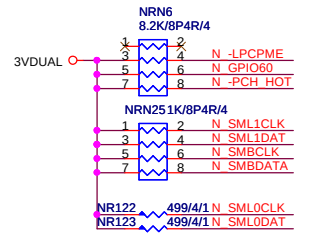
HSW_STRAP13

32.768KHZ



CLR_CMOS





Gigabyte Technology			
Title: PCH GPIO , CTRL , AUDIO			
Size: Custom	Document Number: GA-B85M-D3H		Rev: 2.1
Date: Thursday, January 08, 2015	Sheet 12 of 32		

PCH (H)

PCHH

DH82B85/S[10HB1-030B85-20R]

VCC3_DAC

CLOSE北橋(注意震盪水波紋)

3VDUAL_PCH

SHT PWR

H97 N/A

MASK

R1.0

SHORT WIRE

[Z97]

CAP

(3.3V)(X6)

(1.05V)(X5)

(1.05V)(X6)

(1.05V)(X2)

(3.3V)(X2)

(1.05V)(X10)

PCH (I)

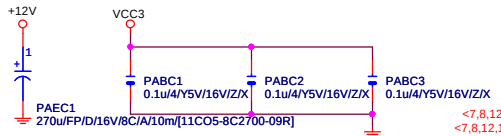
PCHI

DH82B85/S[10HB1-030B85-20R]

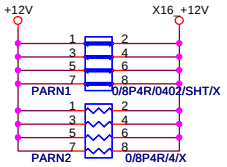
Title	PCH PWR ,GND
Size	Custom
Document Number	GA-B85M-D3H
Rev	2.1
Date:	Thursday, January 08, 2015
Sheet	13 of 32

Gigabyte Technology

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-Q-1

3GIO_*16

PCIEX16

	B1	12V	
	B2	12V	
	B3	RSVD	
PAR3 MASK/0/4/SHT/M/X	B4	GND	
<7,8,12,15,16,19> N_SMBCLK	B5	SMCLK	
<7,8,12,15,16,19> N_SMBDATA	B6	SMDAT	
	B7	GND	
3VDUAL VCC3	B8	3.3V	
	B9	JTAG1	
	B10	3.3VAUX	
<12,15,24,32> N_-PCIE_WAKE	B11	WAKE*	
		KEY	
	B12	RSVD	
	B13	GND	
PA_EXP_TXP0_C	B14	HSOP0	
PA_EXP_TXN0_C	B15	HSON0	
	B16	GND	
	B17	PRSNT2*	
	B18	GND	
PA_EXP_TXP1_C	B19	HSOP1	
PA_EXP_TXN1_C	B20	HSON1	
	B21	GND	
	B22	GND	
PA_EXP_TXP2_C	B23	HSOP2	
PA_EXP_TXN2_C	B24	HSON2	
	B25	GND	
	B26	GND	
PA_EXP_TXP3_C	B27	HSOP3	
PA_EXP_TXN3_C	B28	HSON3	
	B29	GND	
	B30	RSVD	
	B31	PRSNT2*	
	B32	GND	
PA_EXP_TXP4_C	B33	HSOP4	
PA_EXP_TXN4_C	B34	HSON4	
	B35	GND	
	B36	GND	
PA_EXP_TXP5_C	B37	HSOP5	
PA_EXP_TXN5_C	B38	HSON5	
	B39	GND	
	B40	GND	
PA_EXP_TXP6_C	B41	HSOP6	
PA_EXP_TXN6_C	B42	HSON6	
	B43	GND	
	B44	GND	
PA_EXP_TXP7_C	B45	HSOP7	
PA_EXP_TXN7_C	B46	HSON7	
	B47	GND	
	B48	PRSNT2*	
	B49	GND	
PA_EXP_TXP8_C	B50	HSOP8	
PA_EXP_TXN8_C	B51	HSON8	
	B52	GND	
	B53	GND	
PA_EXP_TXP9_C	B54	HSOP9	
PA_EXP_TXN9_C	B55	HSON9	
	B56	GND	
	B57	GND	
PA_EXP_TXP10_C	B58	HSOP10	
PA_EXP_TXN10_C	B59	HSON10	
	B60	GND	
	B61	GND	
PA_EXP_TXP11_C	B62	HSOP11	
PA_EXP_TXN11_C	B63	HSON11	
	B64	GND	
	B65	GND	
PA_EXP_TXP12_C	B66	HSOP12	
PA_EXP_TXN12_C	B67	HSON12	
	B68	GND	
	B69	GND	
PA_EXP_TXP13_C	B70	HSOP13	
PA_EXP_TXN13_C	B71	HSON13	
	B72	GND	
	B73	GND	
PA_EXP_TXP14_C	B74	HSOP14	
PA_EXP_TXN14_C	B75	HSON14	
	B76	GND	
	B77	GND	
PA_EXP_TXP15_C	B78	HSOP15	
PA_EXP_TXN15_C	B79	HSON15	
	B80	GND	
	B81	PRSNT2*	
	B82	RSVD	

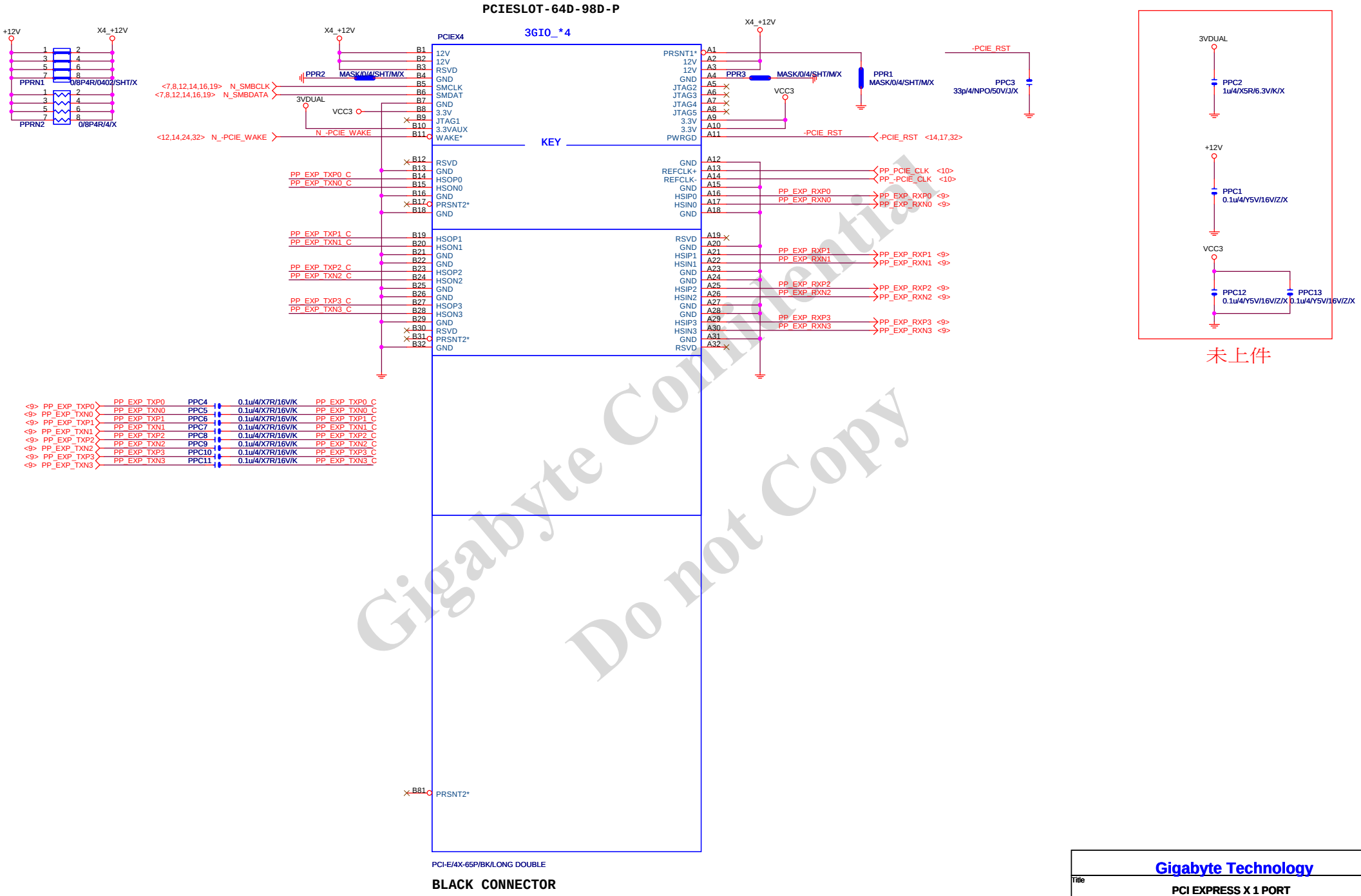
X16_+12V PAR1 MASK/0/4/SHT/M/X	A1	PRSNT1*	
	A2	12V	
	A3	12V	
PAR2 MASK/0/4/SHT/M/X	A4	GND	
	A5	JTAG2	
	A6	JTAG3	
VCC3	A7	JTAG4	
	A8	JTAG5	
	A9	3.3V	
	A10	3.3V	
-PCIE_RST <15,17,32>	A11	PWRGD	
	A12	GND	
PA_SRCCLK_3GIO <10> PA_-SRCCLK_3GIO <10>	A13	REFCLK+	
	A14	REFCLK-	
	A15	GND	
PA_EXP_RXP0	A16	HSIP0	
PA_EXP_RXN0	A17	HSIN0	
	A18	GND	
	A19	RSVD	
PA_EXP_RXP1	A20	GND	
PA_EXP_RXN1	A21	HSIP1	
	A22	HSIN1	
	A23	GND	
	A24	GND	
PA_EXP_RXP2	A25	HSIP2	
PA_EXP_RXN2	A26	HSIN2	
	A27	GND	
	A28	GND	
PA_EXP_RXP3	A29	HSIP3	
PA_EXP_RXN3	A30	HSIN3	
	A31	GND	
	A32	RSVD	
	A33	RSVD	
	A34	GND	
PA_EXP_RXP4	A35	HSIP4	
PA_EXP_RXN4	A36	HSIN4	
	A37	GND	
	A38	GND	
PA_EXP_RXP5	A39	HSIP5	
PA_EXP_RXN5	A40	HSIN5	
	A41	GND	
	A42	GND	
PA_EXP_RXP6	A43	HSIP6	
PA_EXP_RXN6	A44	HSIN6	
	A45	GND	
	A46	GND	
PA_EXP_RXP7	A47	HSIP7	
PA_EXP_RXN7	A48	HSIN7	
	A49	GND	
	A50	RSVD	
	A51	GND	
PA_EXP_RXP8	A52	HSIP8	
PA_EXP_RXN8	A53	HSIN8	
	A54	GND	
	A55	GND	
PA_EXP_RXP9	A56	HSIP9	
PA_EXP_RXN9	A57	HSIN9	
	A58	GND	
	A59	GND	
PA_EXP_RXP10	A60	HSIP10	
PA_EXP_RXN10	A61	HSIN10	
	A62	GND	
	A63	GND	
PA_EXP_RXP11	A64	HSIP11	
PA_EXP_RXN11	A65	HSIN11	
	A66	GND	
	A67	GND	
PA_EXP_RXP12	A68	HSIP12	
PA_EXP_RXN12	A69	HSIN12	
	A70	GND	
	A71	GND	
PA_EXP_RXP13	A72	HSIP13	
PA_EXP_RXN13	A73	HSIN13	
	A74	GND	
	A75	GND	
PA_EXP_RXP14	A76	HSIP14	
PA_EXP_RXN14	A77	HSIN14	
	A78	GND	
	A79	GND	
PA_EXP_RXP15	A80	HSIP15	
PA_EXP_RXN15	A81	HSIN15	
	A82	GND	

-PCIE_RST → PAC1 33p/4/NPO/50V/J/X

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

BLACK CONNECTOR

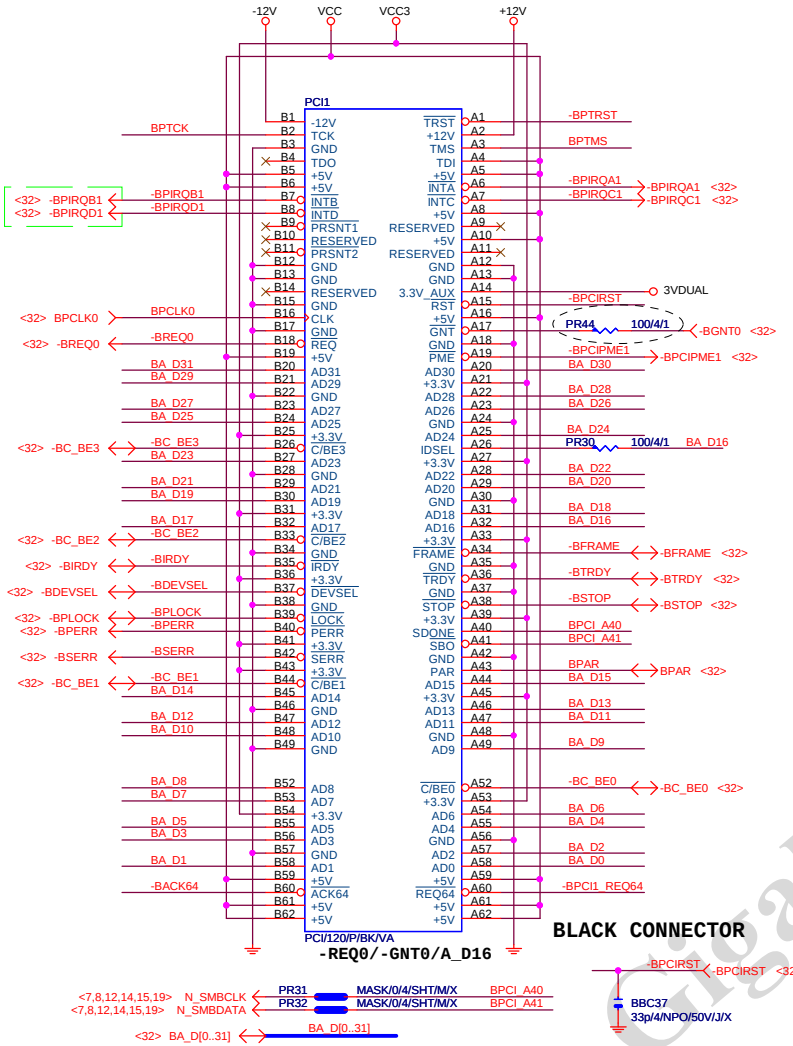
Gigabyte Technology			
Title: PCI EXPRESS * 16			
Size: Custom	Document Number: GA-B85M-D3H		Rev: 2.1
Date: Thursday, January 08, 2015	Sheet 14 of 32		



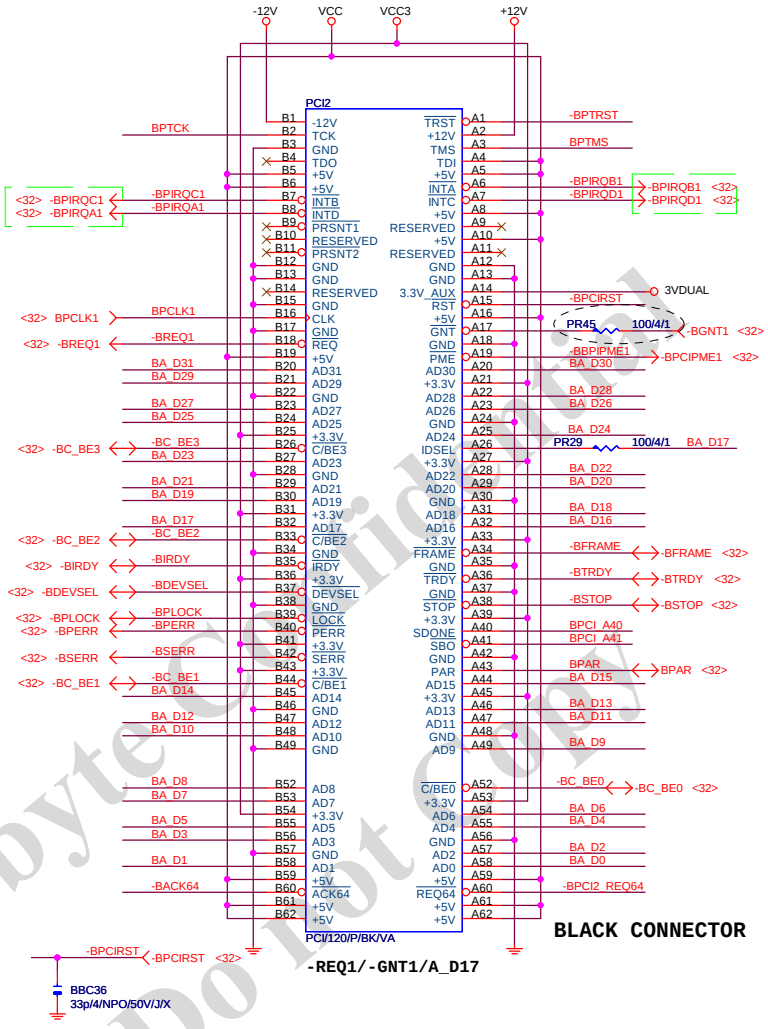
Title	PCI EXPRESS X 1 PORT
Size	Custom
Document Number	GA-B85M-D3H
Rev	2.1
Date:	Thursday, January 08, 2015
Sheet	15 of 32

Gigabyte Technology

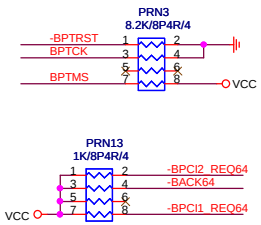
PCI SLOT 1



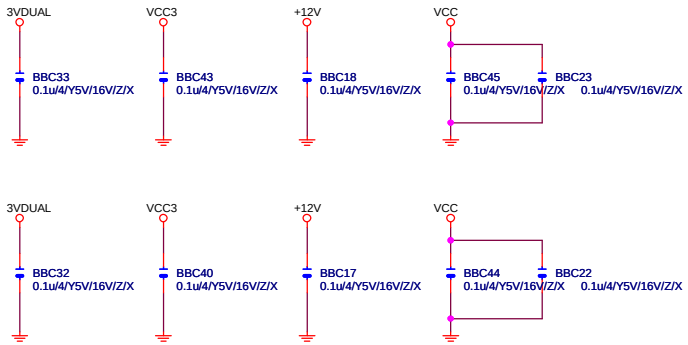
PCI SLOT 2



PCI PU



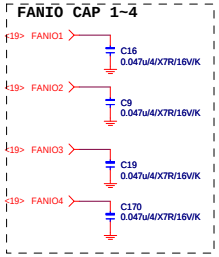
PCI CAP

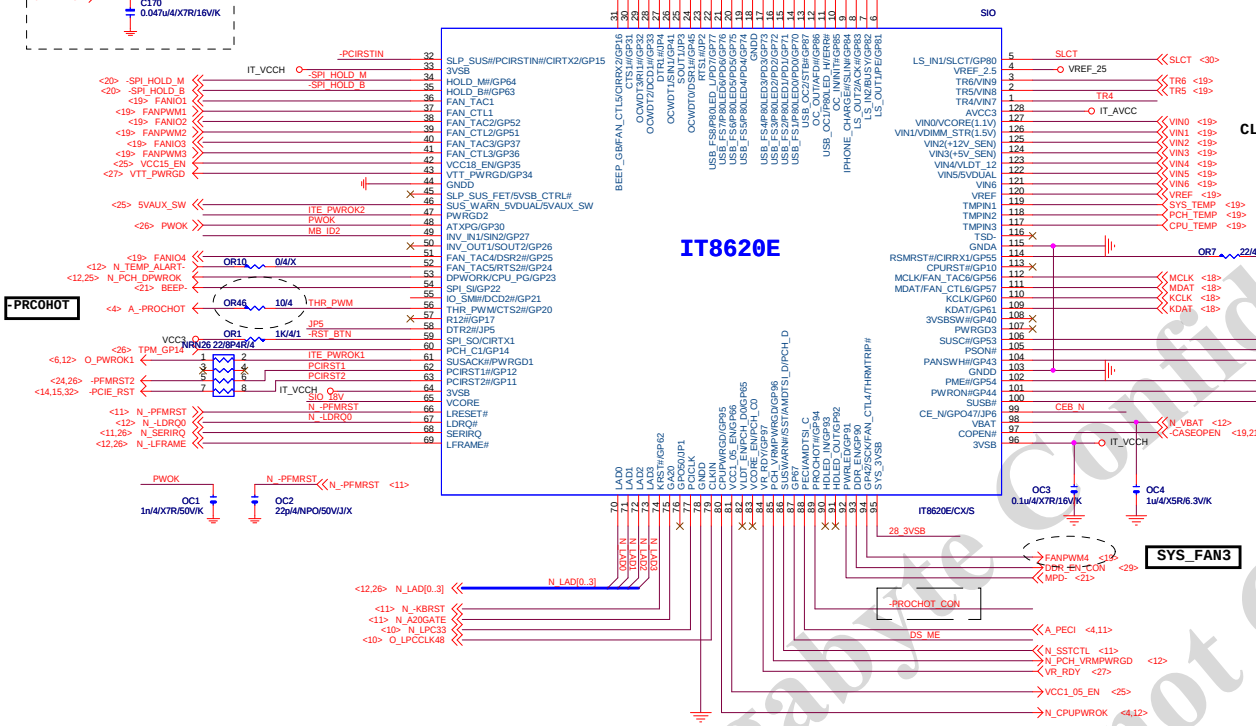


Gigabyte Technology		
Title: PCI SLOT 1&2		
Size: Custom	Document Number: GA-B85M-D3H	Rev: 2.1
Date: Thursday, January 08, 2015	Sheet 16 of 32	

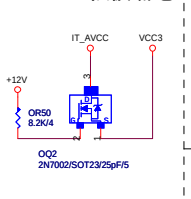
SIO IT8620

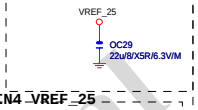
FANIO CAP 1~4



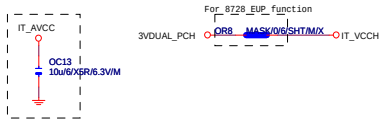


PIX ATX 插拔漏電

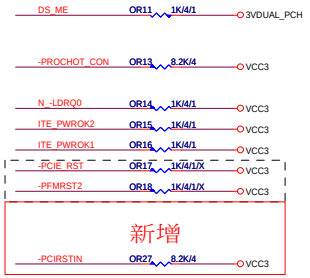




PWR SHT

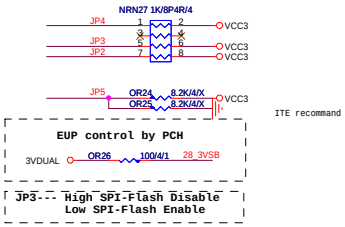


SIO PU



DO8:N/A

SIO STRAP



JP4	1	k8 power sequency function is Disable
	0	k8 power sequency function is Enable
JP3 JP5	1 1	The default value of EC Index 63h/6Bh/73h is 80h.
	1 0	The default value of EC Index 63h/6Bh/73h is FFh.
	0 1	The default value of EC Index 63h/6Bh/73h is 00h.
	0 0	The default value of EC Index 63h/6Bh/73h is 40h.

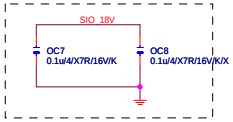
IT8620E GPIO問題匯整	
PIN 50	GP26--- 第一次接上POWER時會拉 LO
PIN 90/91	DEFAULT為HDLED FUNCTION, GP93 BYPASS TO GP92
	高溫時 GP92 會被拉Lo(ITE BUG)
PIN 108	GP40--- POWER ON 時會拉 LO
PIN 111/112	MOUSE 跟FANG FUNCTION 擇一使用,不然會互相干擾

DUAL BIOS OPT STRAP

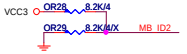
Power leakage N/A

SIO_18V

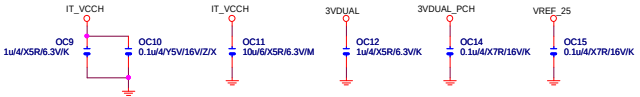
internal power pin, max 22nF cap

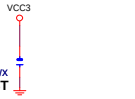


MB ID



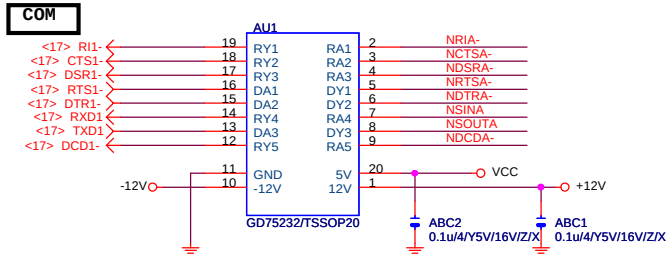
SIO CAP

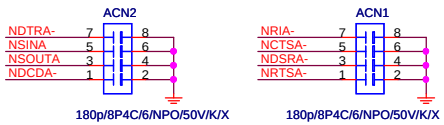


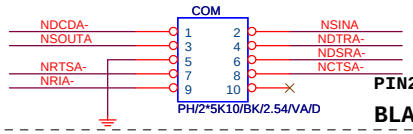


Gigabyte Technology		
Title	ITE 8728 LPC IO	
Size C	Document Number GA-B85M-D3H	Rev 2.1
Date: Thursday, January 08, 2015	Sheet 17 of 32	

COM



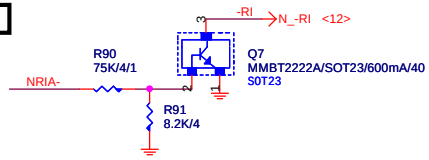




PIN2X5-CUT10-COM

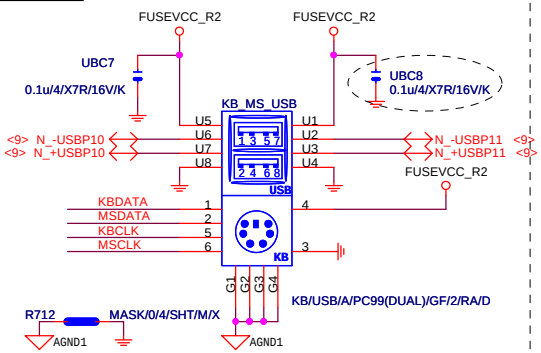
BLACK CONNECTOR

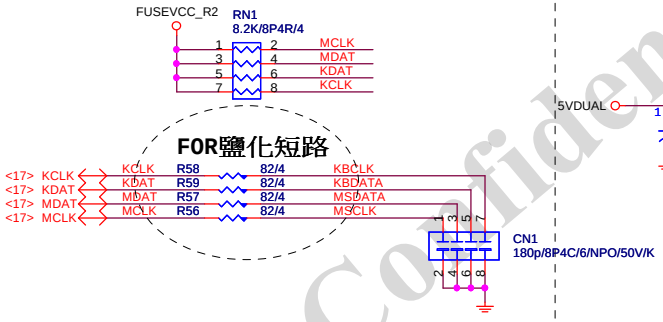
COM RI



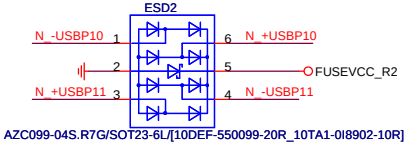
KB/MS

FUSEVCC_R2



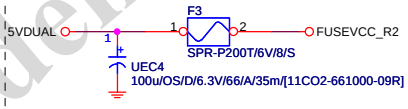


USB2.0 ESD



USB2.0 PWR

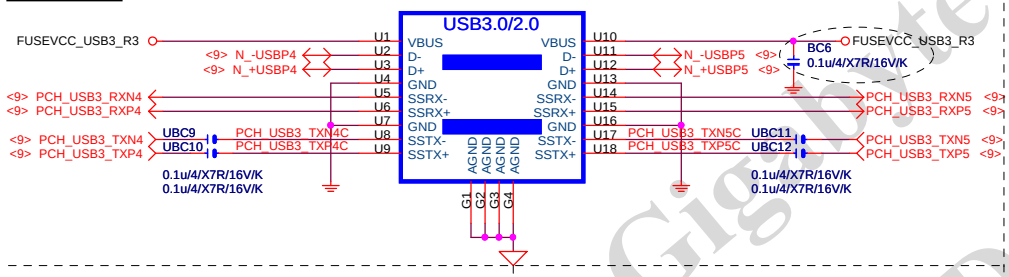
FUSE-0805



Close to connector

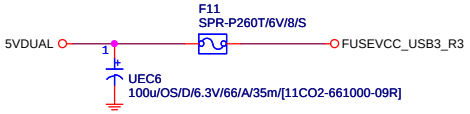
USB30_20

FUSEVCC_USB3_R3



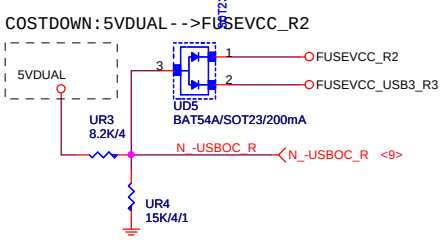
USB30_20 PWR

Polyswitch-1206



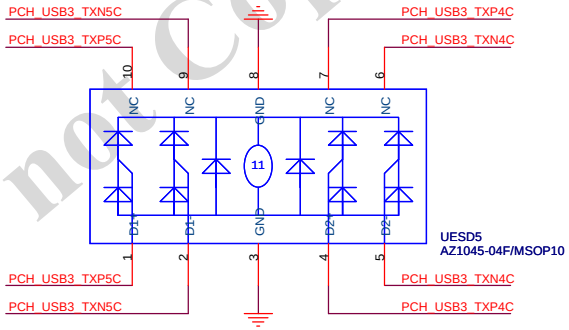
USB3.0 1Port - 1Fuse (3.5A)

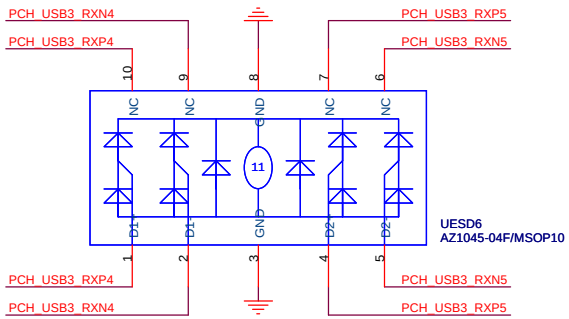
-USBOC_R



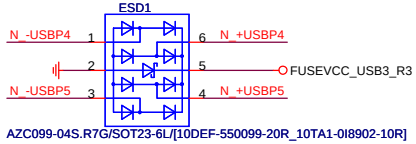
USB30_20 ESD PROCTECT

USB3.0 ESD

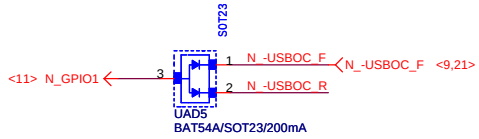




USB2.0 ESD



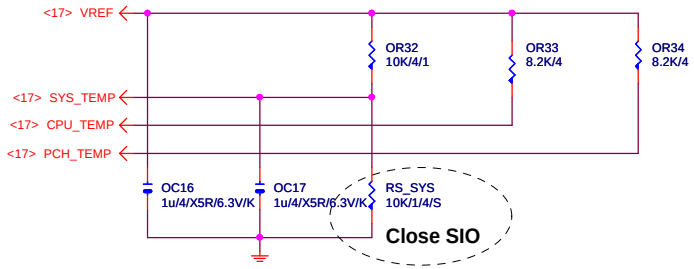
USB POWER PROTECT



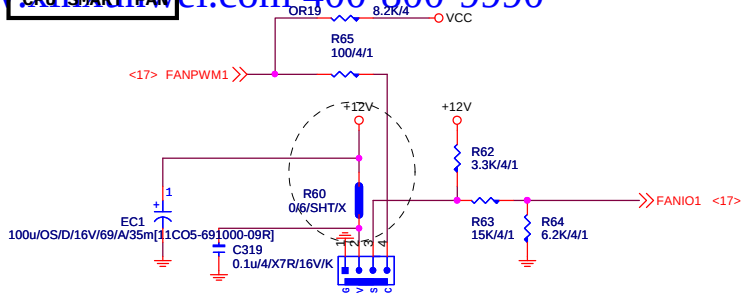
Gigabyte Technology

Title	COM,-RI,KB_USB,USB_ESATA,-PROCHOT	
Size: Custom	Document Number: GA-B85M-D3H	Rev: 2.1
Date: Thursday, January 08, 2015	Sheet 18 of 32	

TEMP H/W MONITOR



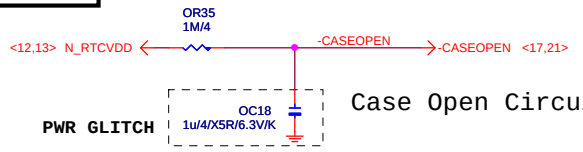
CPU SMART FAN



FOR HOT-PLUG ISSUE

WHITE CONNECTOR

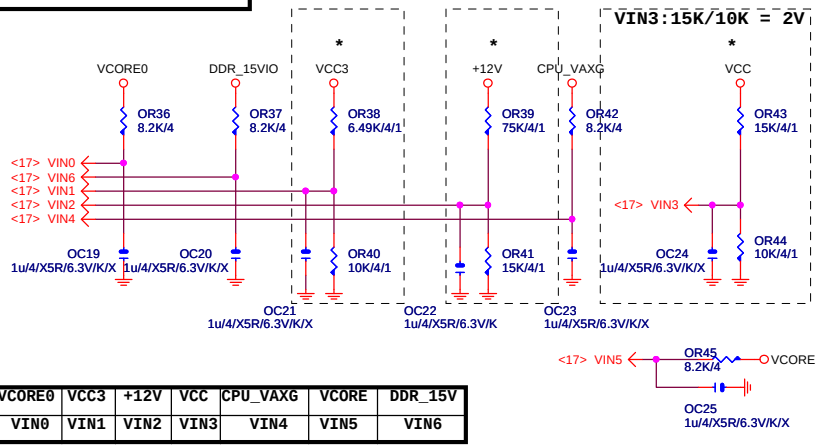
CASE OPEN



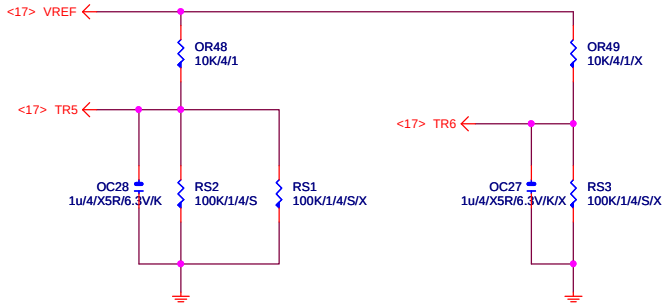
VOLTAGE-- H/W MONITOR

VIN2:75K/15K = 2V

VIN3:15K/10K = 2V

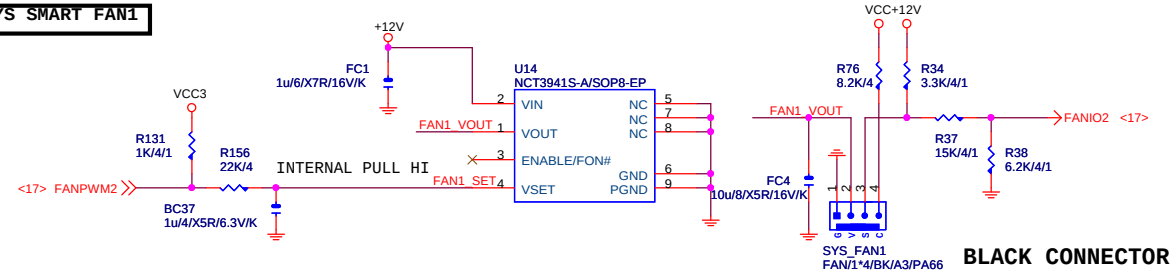


VCORE0	VCC3	+12V	VCC	CPU_VAXG	VCORE	DDR_15V
VIN0	VIN1	VIN2	VIN3	VIN4	VIN5	VIN6



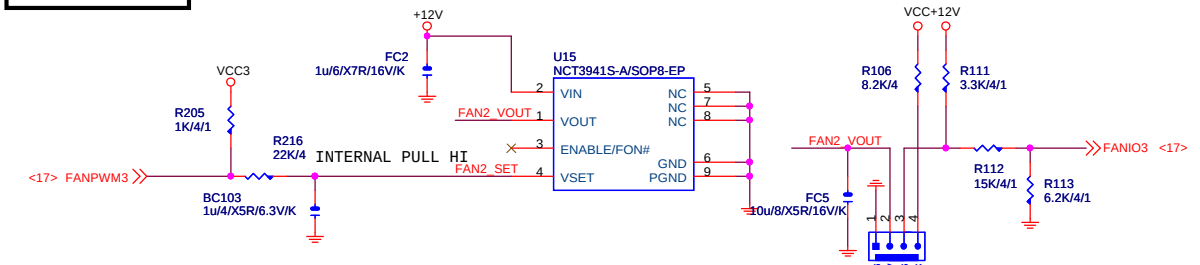
RS1、RS2、RS3 CLOSE CPU VR MOSFET

SYS SMART FAN1



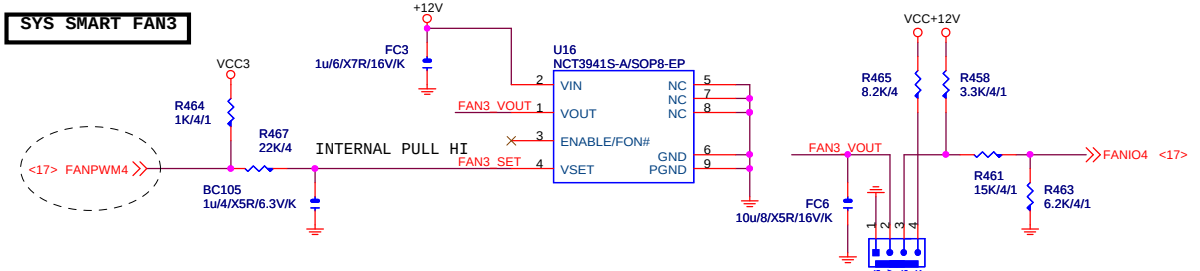
BLACK CONNECTOR

SYS SMART FAN2



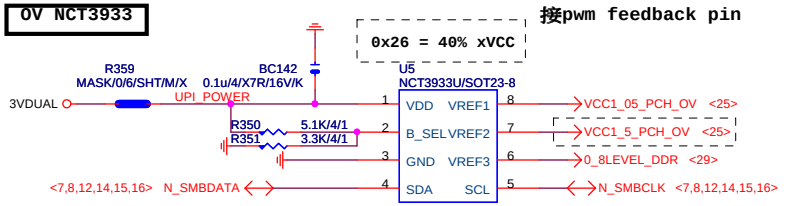
BLACK CONNECTOR

SYS SMART FAN3



BLACK CONNECTOR

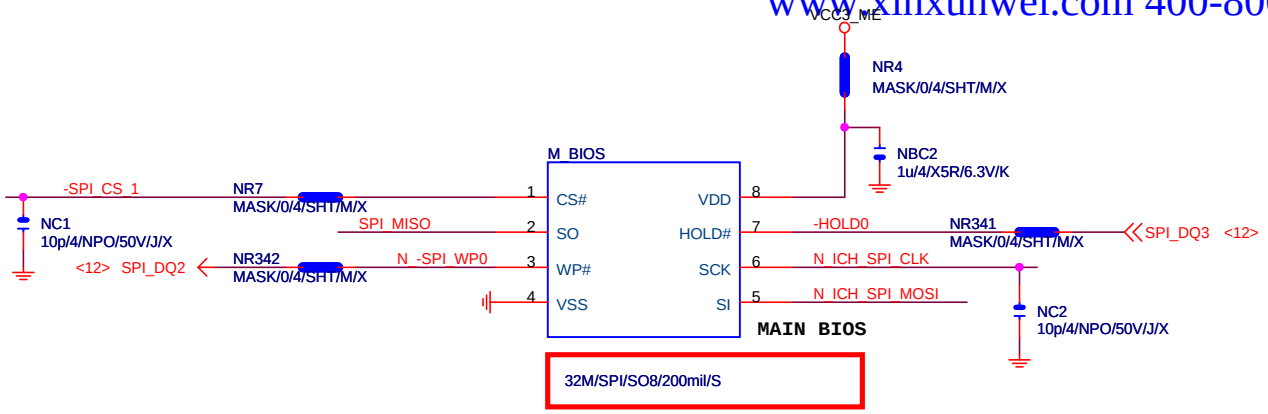
OV NCT3933

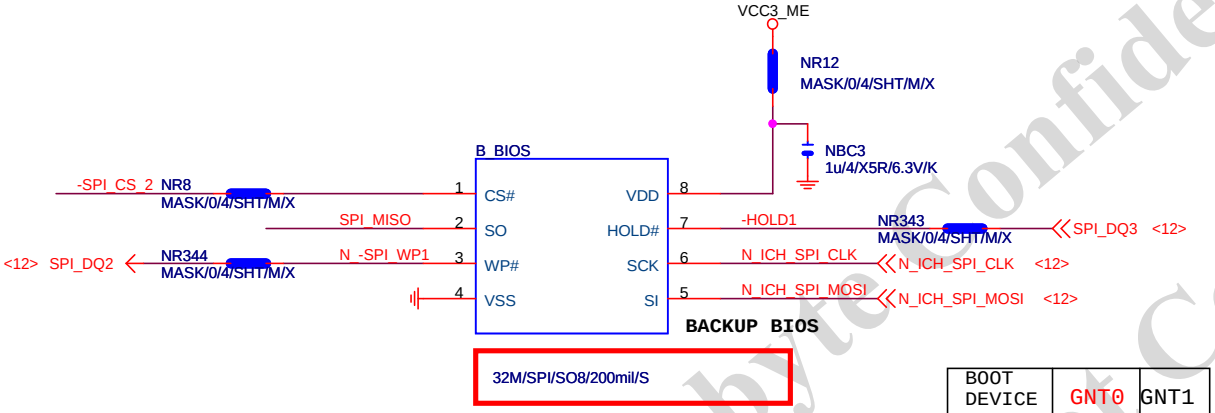


Gigabyte Technology			
Title: HWM,FAN CTRL,OV			
Size: Custom	Document Number: GA-B85M-D3H		Rev: 2.1
Date: Thursday, January 08, 2015	Sheet 19 of 32		

BIOS DEBUG PORT

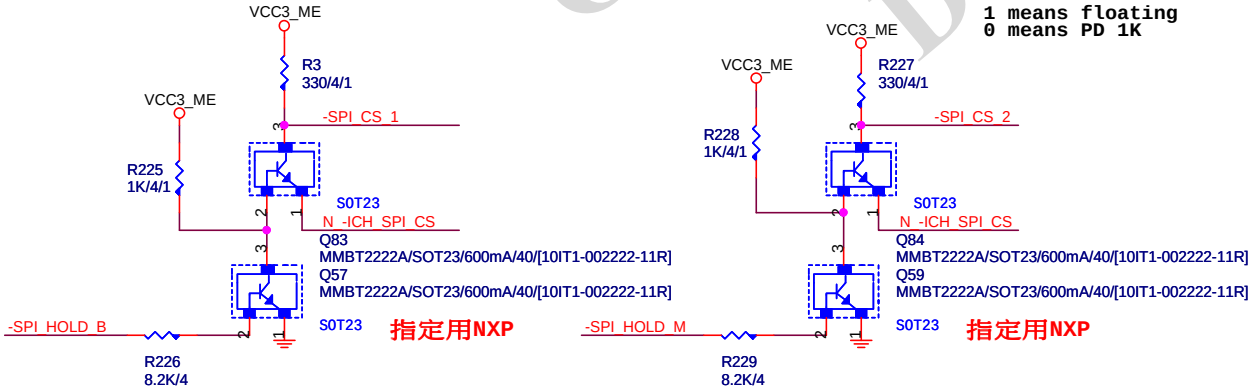
BIOS_PH R1.0 移除



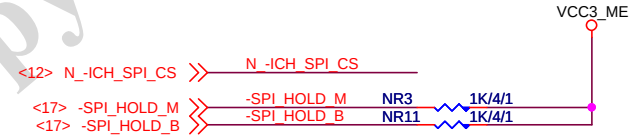


BOOT DEVICE	GNT0	GNT1
LPC	0	0
PCI	0	1
NAND	1	0
SPI	1	1

1 means floating
0 means PD 1K



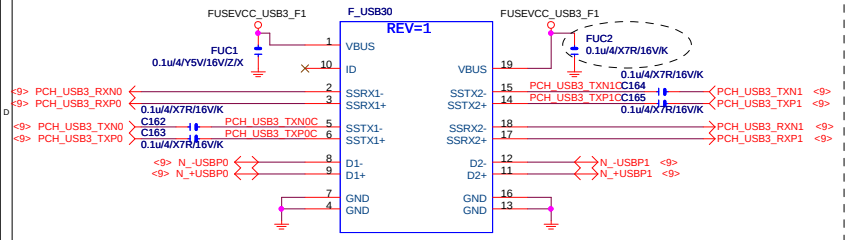
MOSI For DMI RX Termination Voltage



Gigabyte Technology

Title	DUAL BIOS	
Size: Custom	Document Number: GA-B85M-D3H	Rev: 2.1
Date: Thursday, January 08, 2015	Sheet 20 of 32	

F_USB30 FUSEVCC_USB3_F1

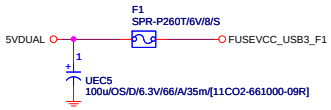


BH/2*10K20/BK/ON/2.0/VA/D/GF

BLACK CONNECTOR

F_USB30 PWR

Polyswitch-1206

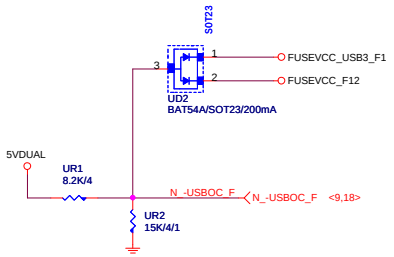


USB3.0 1Port - 1Fuse (3.5A)

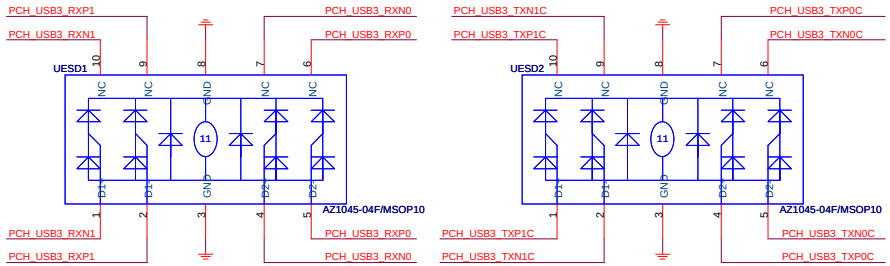
Close to connector

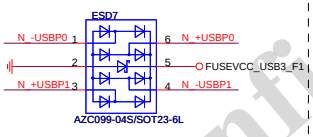
SATA LED

-USBOC_F



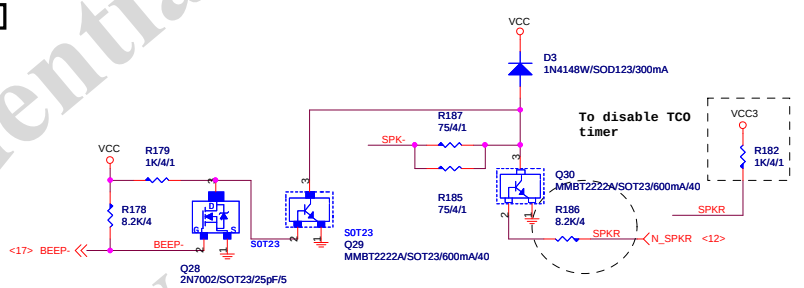
F_USB30 ESD PROTECT



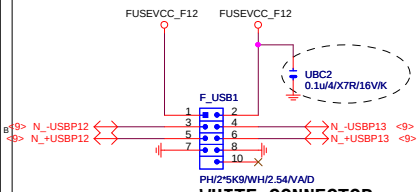


Close to connector

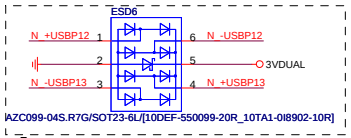
SPKR



FRONT USB1 FUSEVCC_F12



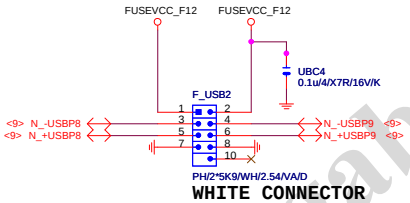
WHITE CONNECTOR



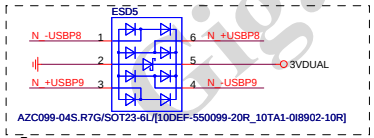
Close to connector

FUSE-0805

FRONT USB2 FUSEVCC_F4



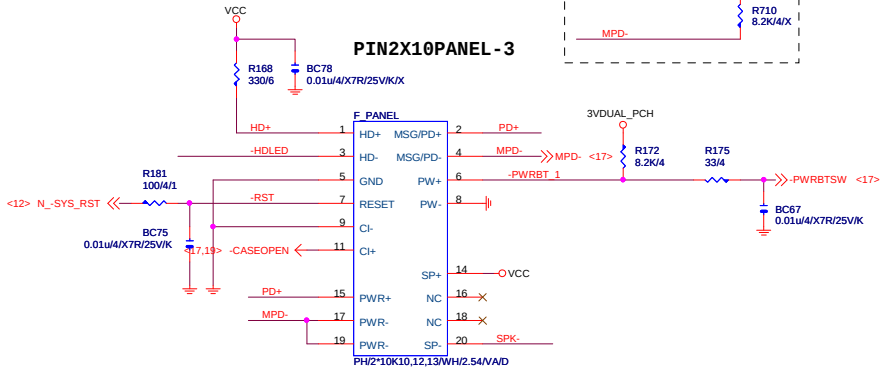
WHITE CONNECTOR

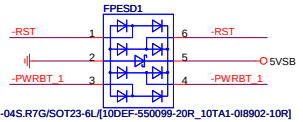


Close to connector

FUSE-0805

INTEL FRONT PANEL

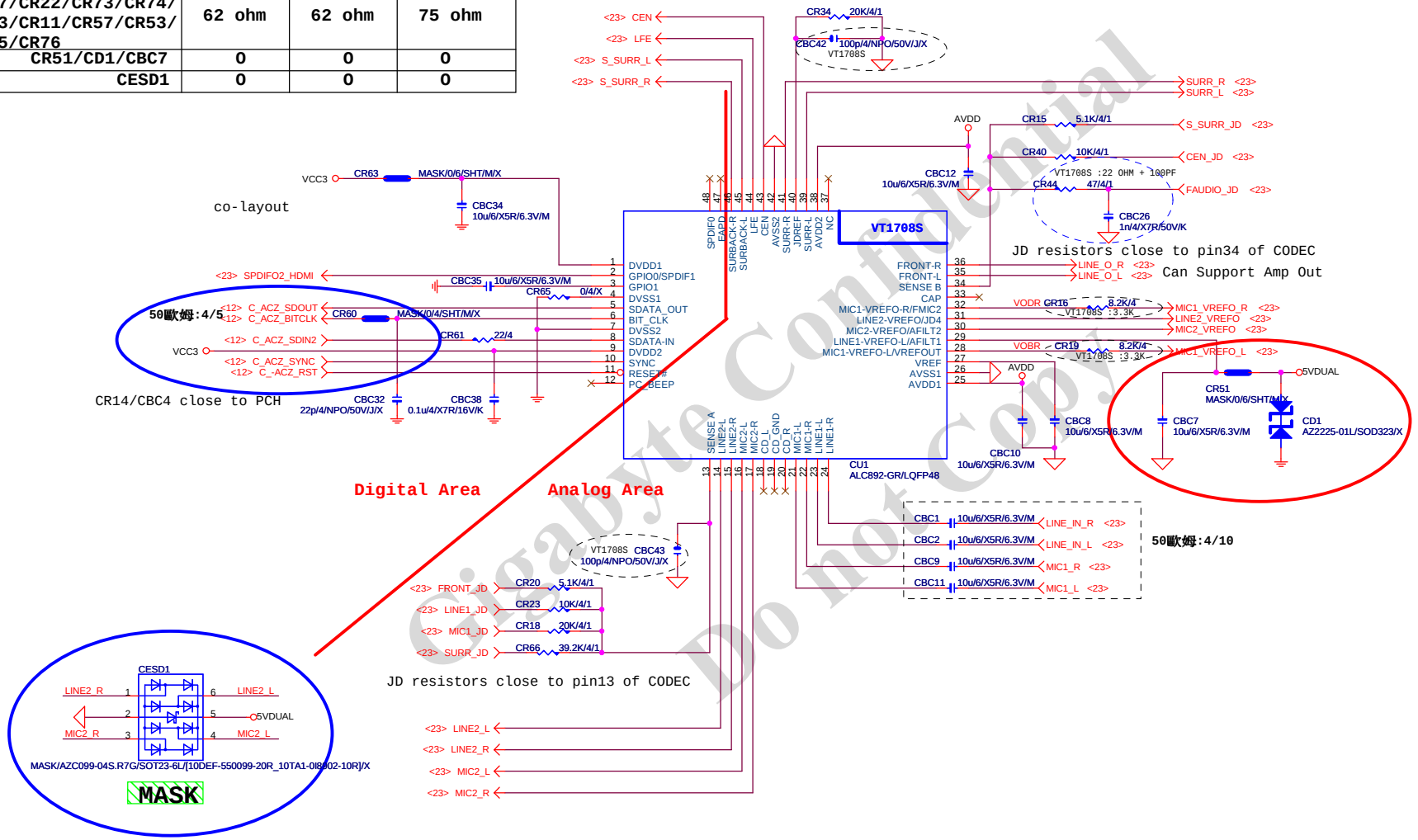




Gigabyte Technology			
Title: FP,F_USB,USB PWR,SPKR,SATA LED			
Size: Custom	Document Number: GA-B85M-D3H		Rev: 2.1
Date: Thursday, January 08, 2015	Sheet 21 of 32		

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



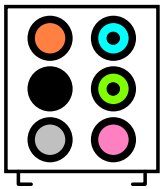
Gigabyte Technology	
Title	HD AUDIO ALC887B-VD2/VT1708S/VT2021
Size: Custom	Document Number: GA-B85M-D3H
Rev: 2.1	
Date: Thursday, January 08, 2015	Sheet 22 of 32

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

SPDIF_OUT

<22> SPDIFO2_HDMI — CR26 MASK/0/4/SHT/M/X — PIN
CBC14 100p/4/NPO/50V/J
SPDIF_O PH/1*2/BK/2.54/VA/D
For HDMI SPDIF

AZALIA JACK



AZALIA JACK

AUDIOB
<22> LINE1_JD — LINE1_JD — AJ_A5 — AJ_A2 — GND LINE-IN
<22> FRONT_JD — FRONT_JD — AJ_B5 — AJ_B2 — GND LINE-OUT
<22> MIC1_JD — MIC1_JD — AJ_C5 — AJ_C2 — GND MIC-IN
2X3RP/26P/OR,BK,GY,BU,GE,PK/RA

BLUE LINE-IN
GREEN LINE-OUT
PINK MIC-IN

AUDIOA
<22> CEN_JD — CEN_JD — BJ_B5 — BJ_B2 — GND REAR
<22> SURR_JD — SURR_JD — BJ_C5 — BJ_C2 — GND CEN
<22> S_SURR_JD — S_SURR_JD — BJ_A5 — BJ_A2 — GND SIDE
2X3RP/26P/OR,BK,GY,BU,GE,PK/RA

Orange CEN/LFE
Black SURROUND
Gray SURROUND SIDE

LINE-OUT

CEC1 100uF/D/10V/6*5/[11CE2-651000-05R]
<22> LINE_O_R — CR5 62/4 — CR7 22K/4 — AJ_B5
CEC2 100uF/D/10V/6*5/[11CE2-651000-05R]
<22> LINE_O_L — CR8 62/4 — CR6 22K/4 — AJ_B2
CBC19 180p/4/NPO/50V/J/X
CBC24 180p/4/NPO/50V/J/X

Only reserved for ALC888

LINE-IN

<22> LINE_IN_R — CR1 62/4 — AJ_A5
<22> 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

<22> MIC1_R — CR17 62/4 — AJ_C5
<22> MIC1_L — CR22 62/4 — AJ_C2
<22> MIC1_VREFO_L
<22> MIC1_VREFO_R
CBC3 180p/4/NPO/50V/J/X
CBC4 180p/4/NPO/50V/J/X

SURROUND

CEC10 100uF/D/10V/6*5/[11CE2-651000-05R]
<22> SURR_R — CR73 62/4 — CR67 22K/4 — BJ_C5
CEC11 100uF/D/10V/6*5/[11CE2-651000-05R]
<22> SURR_L — CR74 62/4 — CR68 22K/4 — BJ_C2
CBC44 180p/4/NPO/50V/J/X
CBC45 180p/4/NPO/50V/J/X

CEN/LFE

CEC12 100uF/D/10V/6*5/[11CE2-651000-05R]
<22> LFE — CR75 62/4 — CR69 22K/4 — BJ_B5
CEC13 100uF/D/10V/6*5/[11CE2-651000-05R]
<22> CEN — CR76 62/4 — CR70 22K/4 — BJ_B2
CBC46 180p/4/NPO/50V/J/X
CBC47 180p/4/NPO/50V/J/X

SURR BACK

EMI
CEC14 100uF/D/10V/6*5/[11CE2-651000-05R]
<22> S_SURR_R — CR79 62/4 — CR71 22K/4 — BJ_A5
CEC15 100uF/D/10V/6*5/[11CE2-651000-05R]
<22> S_SURR_L — CR80 62/4 — CR72 22K/4 — BJ_A2
CBC48 180p/4/NPO/50V/J/X
CBC49 180p/4/NPO/50V/J/X

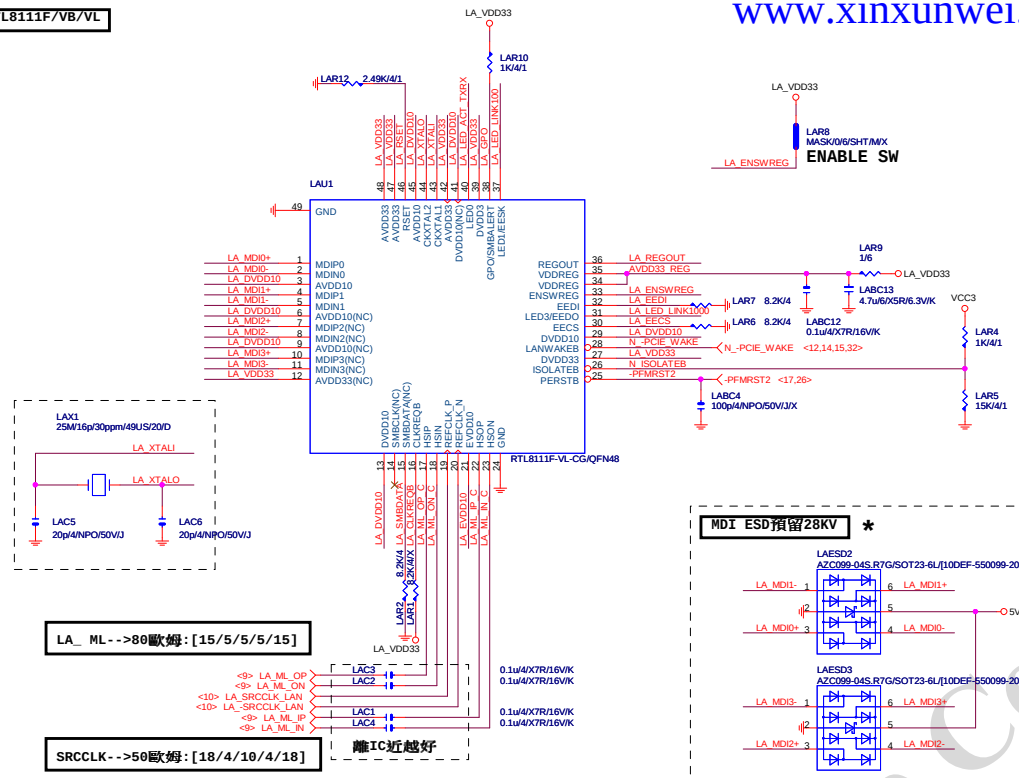
AZALIA FRONT PANEL

VT1708S :3.3K
CQ2 BAT54A/SOT23/200mA
<22> MIC2_VREFO
CQ4 BAT54A/SOT23/200mA
<22> LINE2_VREFO
SOT23
NRN28
8.2K/8P4R/4
<22> MIC2_L — CBC6 10u/6/X5R/6.3V/M — CR13 62/4 — M2_L
<22> MIC2_R — CBC5 10u/6/X5R/6.3V/M — CR11 62/4 — M2_R
L2_R CR57 62/4 L2-R
<22> FAUDIO_JD
L2_L CR53 62/4 L2-L
CR58 22K/4
CR54 22K/4
F_AUDIO
CR55 20K/4/1
CR59 39.2K/4/1
CR12 0/4/X
PH/2*5K8/GY/2.54/VA/D
GRAY 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
100uF/D/10V/6*5/[11CE2-651000-05R]
<22> LINE2_R — CEC9 — L2_R
<22> LINE2_L — CEC6 — L2_L
100uF/D/10V/6*5/[11CE2-651000-05R]

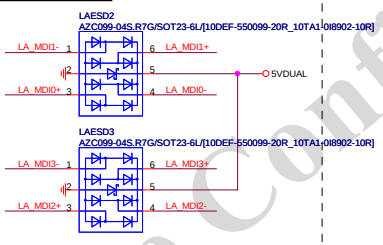
Gigabyte Technology

Title	AUDIO JACK		
Size Custom	Document Number GA-B85M-D3H		Rev 2.1
Date: Thursday, January 08, 2015	Sheet 23 of 32		

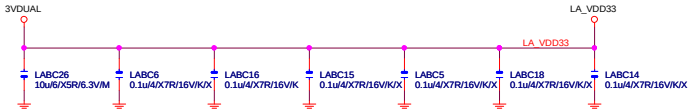
LAN:RTL8111F/VB/VL



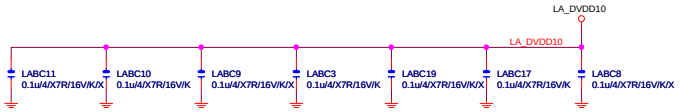
MDI ESD預留28KV *



LAN POWER

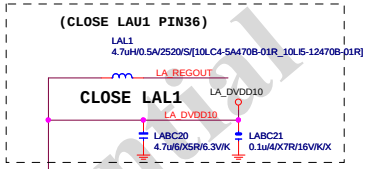


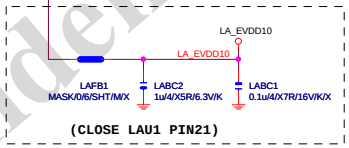
(CLOSE LAU1 PIN:12,27,39,42,47,48)



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

(CLOSE LAU1 PIN36)





(CLOSE LAU1 PIN21)

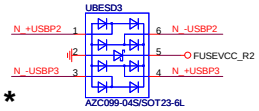
Power domain chart

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

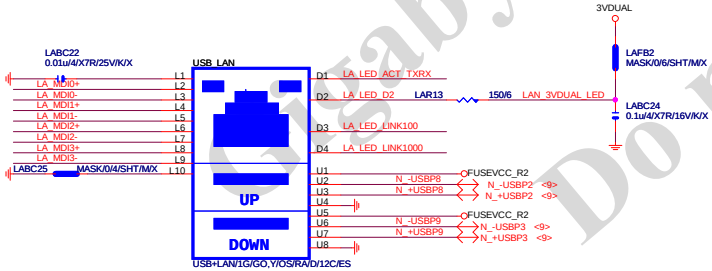
USB_LAN CONNECTOR

FUSEVCC_USB3_R5

LA_MDI-->100歐姆:[20/4/8/4/20]



* 使用RU9 USB_LAN可省略LAESD1保護LED



USB X3 POWER

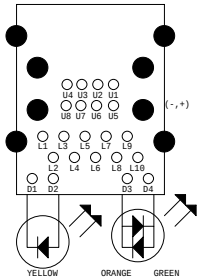
Polyswitch-1206

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

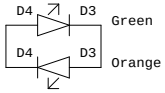
EMI SHORT PAD

PS:視EMI需求

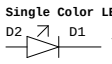
注意:USB PORT(目前:暫代6,7PORT)
USB-->90歐姆:[15/4.5/7.5/4.5/15]



Dual Color LED



Single Color LED



BOM NOTICE *

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

[LED獨立走線,可省略外加AZC099料件LAESD1]

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

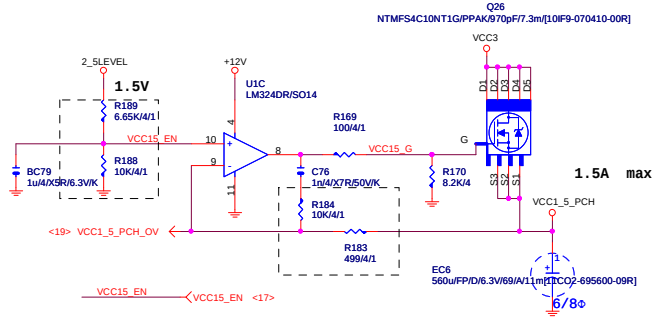
Gigabyte Technology

Title: Realtek RTL8111G

Size: Custom | Document Number: GA-B85M-D3H | Rev: 2.1

Date: Thursday, January 08, 2015 | Sheet 24 of 32

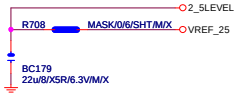
VCC1_5_PCH



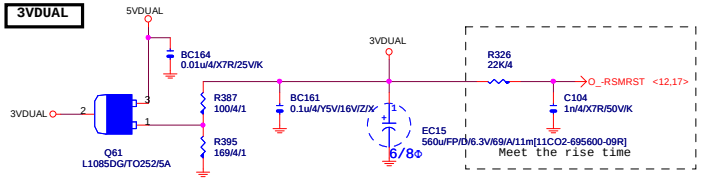
2_5LEVEL

FOOT MASK

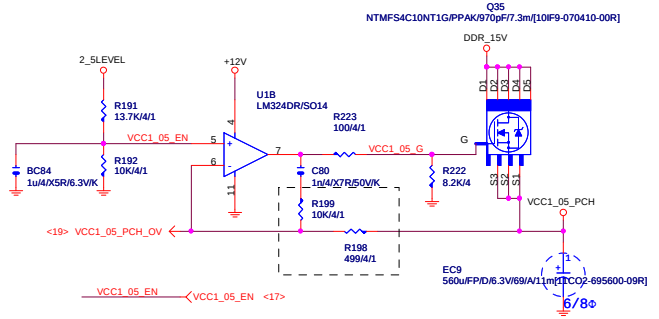
MASK

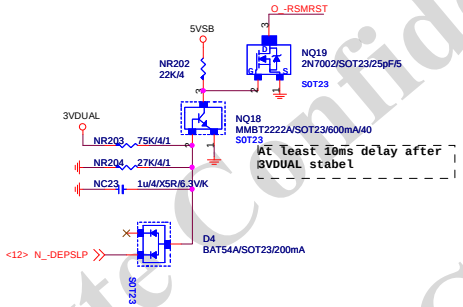


3VDUAL

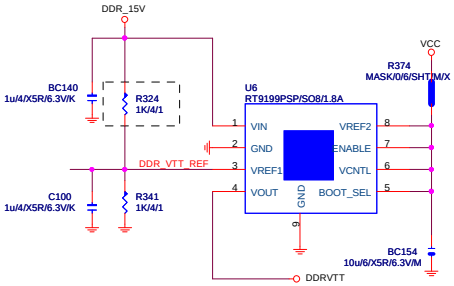


VCC1_05_PCH

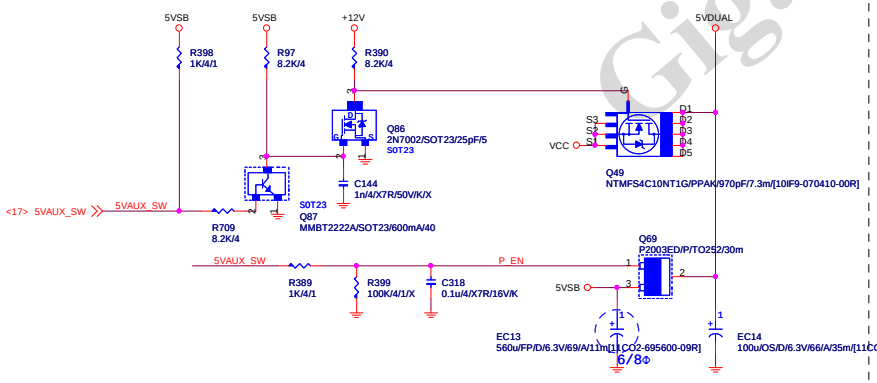




DDRVTT

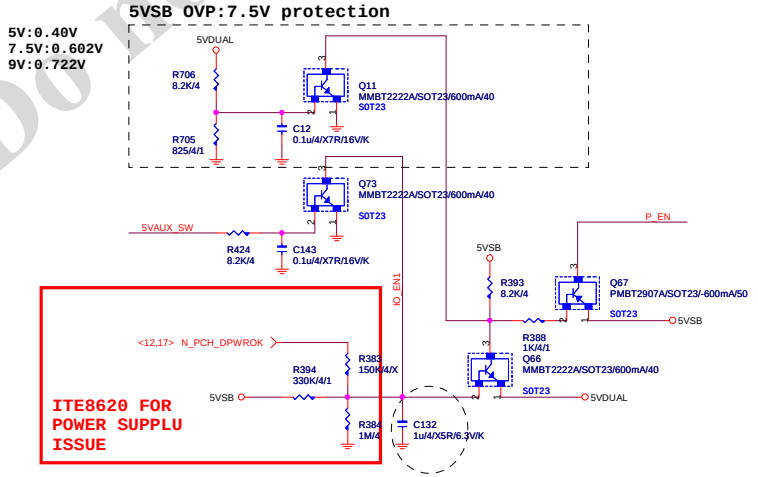


5VDUAL



5VDUAL SHORT PROTECT

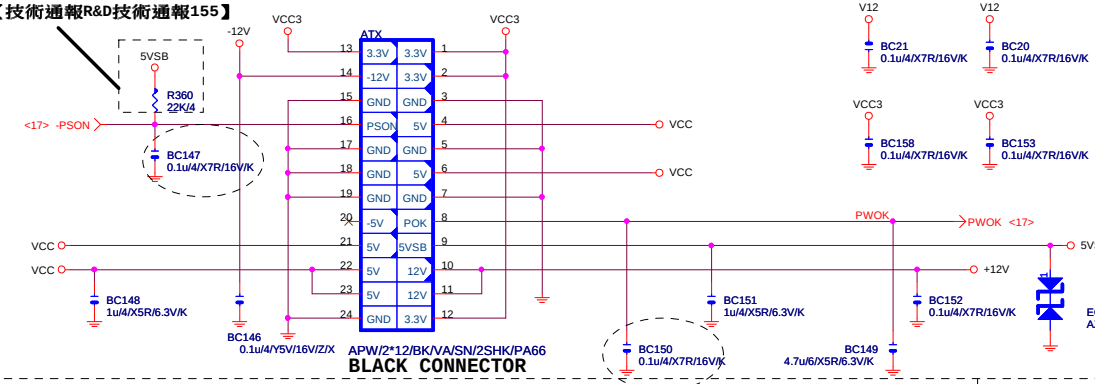
5V:0.40V
7.5V:0.602V
9V:0.722V



Gigabyte Technology		
Title: DISCRETE POWER		
Size: Custom	Document Number: GA-B85M-D3H	Rev: 2.1
Date: Thursday, January 08, 2015	Sheet 25 of 32	

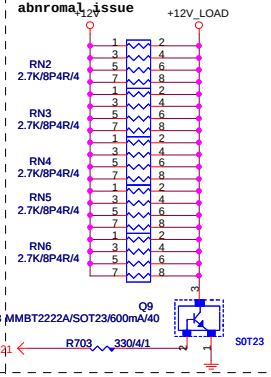
ATXX24 POWER CONNECTOR

【技術通報R&D技術通報155】

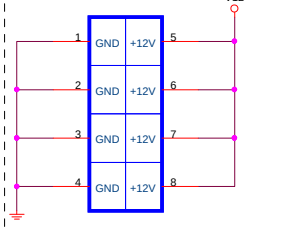


【技術通報R&D技術通報153】

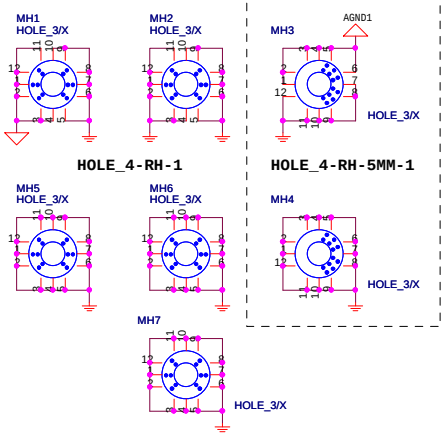
To fix 12V light load abnormal issue

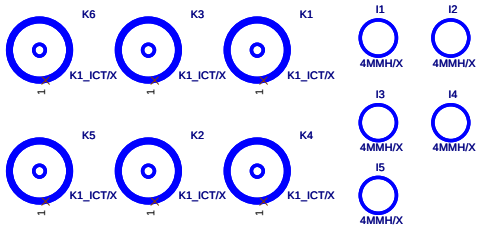


ATXX4 POWER CONNECTOR



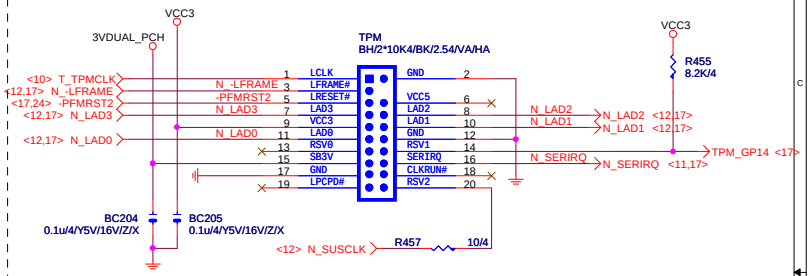
BLACK CONNECTOR





To prevent the 5VSB under loading when boot

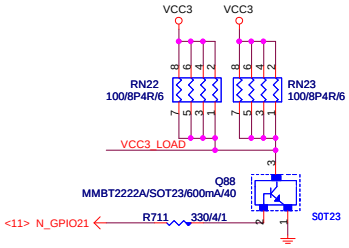
TPM



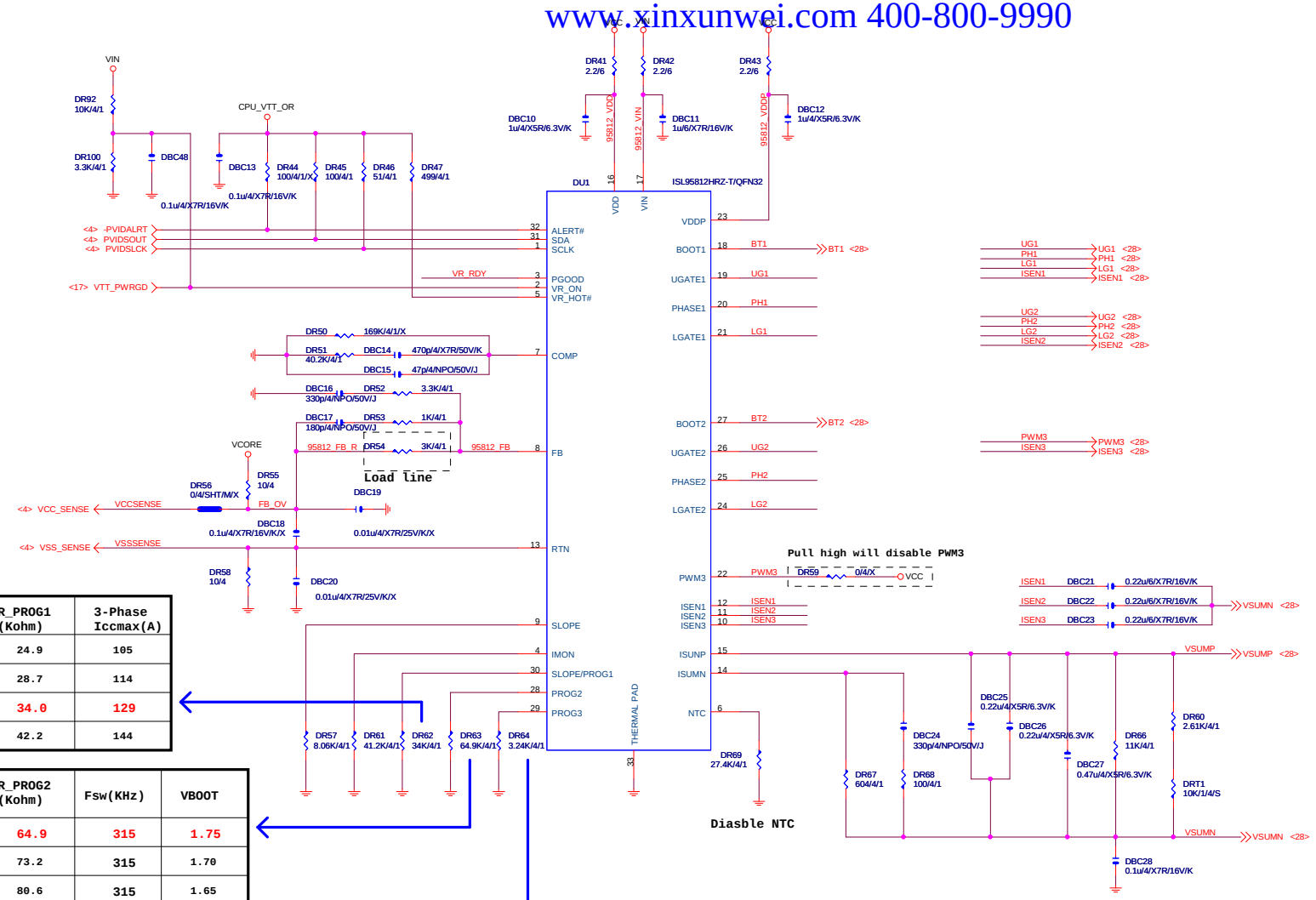
PWOK PATCH

【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-B85M-D3H	Rev: 2.1
Date: Thursday, January 08, 2015	Sheet 26 of 32	



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-B85M-D3H | Rev: 2.1

Date: Thursday, January 08, 2015 | Sheet 27 of 32

PHASE 1

UG1 → UG1 <27>
PH1 → PH1 <27>
LG1 → LG1 <27>

VIN
DAC1 1u/6/X7R/16V/K

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

[1]

VIN
DAQ1 NTMFS4C08NT1G/PPAK/1113pF/5.8m/[10IF9-584081-00R]
UG1_1
PH1
LG1_1
DAQ2 NTMFS4C08NT1G/PPAK/1113pF/5.8m/[10IF9-584081-00R]

DAL1 0.68uH/40A/IMD119/M/D
R50
VCORE
DAR4 0/4/SHT/M/X
DAR5 0/4/SHT/M/X

<27> VSUMP VSUMP DAR7 3.6K/4/1
<27> ISEN1 ISEN1 DAR9 10K/4/1
<27> VSUMN VSUMN DAR10 10/4 V1N
ISEN2 DAR11 10K/4/1
ISEN3 DAR12 10K/4/1

Close to PWM

PHASE 3

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

PWM3 → PWM3 <27>

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

[3]

VIN
DCQ1 NTMFS4C08NT1G/PPAK/1113pF/5.8m/[10IF9-584081-00R]
UG3_1
PH3
LG3_1
DCQ2 NTMFS4C08NT1G/PPAK/1113pF/5.8m/[10IF9-584081-00R]

DCL1 0.68uH/40A/IMD119/M/D
R50
VCORE
DCR4 0/4/SHT/M/X
DCR5 0/4/SHT/M/X

<27> VSUMP VSUMP DCR7 3.6K/4/1
<27> ISEN3 ISEN3 DCR9 10K/4/1
<27> VSUMN VSUMN DCR10 10/4 V3N
ISEN1 DCR11 10K/4/1
ISEN2 DCR12 10K/4/1

Close to PWM

PHASE 2

UG2 → UG2 <27>
PH2 → PH2 <27>
LG2 → LG2 <27>

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

[2]

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

V12 VIN
DEC10 DEC11
270u/FP/D/16V/8C/A/10m[11CO5-8C2700-09R]
270u/FP/D/16V/8C/A/10m[11CO5-8C2700-09R]

VIN
DBQ1 NTMFS4C08NT1G/PPAK/1113pF/5.8m/[10IF9-584081-00R]
UG2_1
PH2
LG2_1
DBQ2 NTMFS4C08NT1G/PPAK/1113pF/5.8m/[10IF9-584081-00R]

DBL1 0.68uH/40A/IMD119/M/D
R50
VCORE
DBR4 0/4/SHT/M/X
DBR5 0/4/SHT/M/X

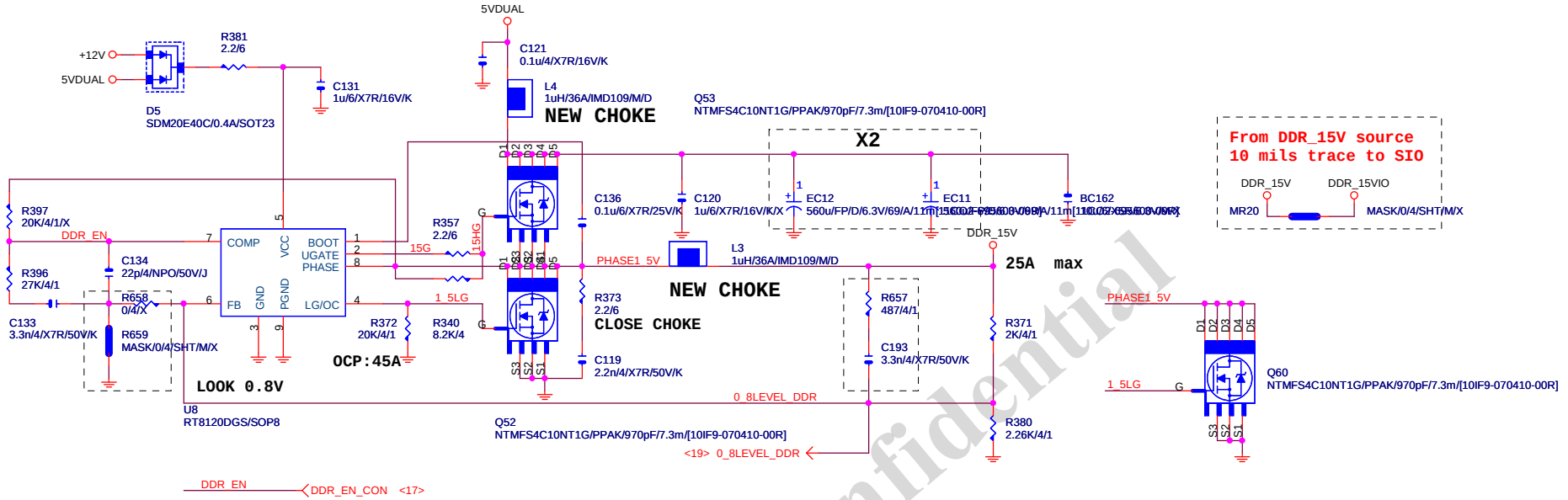
<27> VSUMP VSUMP DBR7 3.6K/4/1
<27> ISEN2 ISEN2 DBR9 10K/4/1
<27> VSUMN VSUMN DBR10 10/4 V2N
ISEN1 DBR11 10K/4/1
ISEN3 DBR12 10K/4/1

Close to PWM

Gigabyte Technology

Title	CPU CORE VR-2	
Size: Custom	Document Number: GA-B85M-D3H	Rev: 2.1
Date: Thursday, January 08, 2015	Sheet 28 of 32	

DDR15V



PWR SEQ

VIN=5V,VOUT=1.5V,IOUT=25A,PHASE=1
IRMS=11.45A
560u/FP/D/6.3V/68/8m RIPPLE CURRENT=4.7A
Coefficient=1.7(85℃),1(105℃)
VIN Ripple current=4.7X1.7=7.99A(85℃)
-->故固態電容須2X7.99=15.98>11.45A

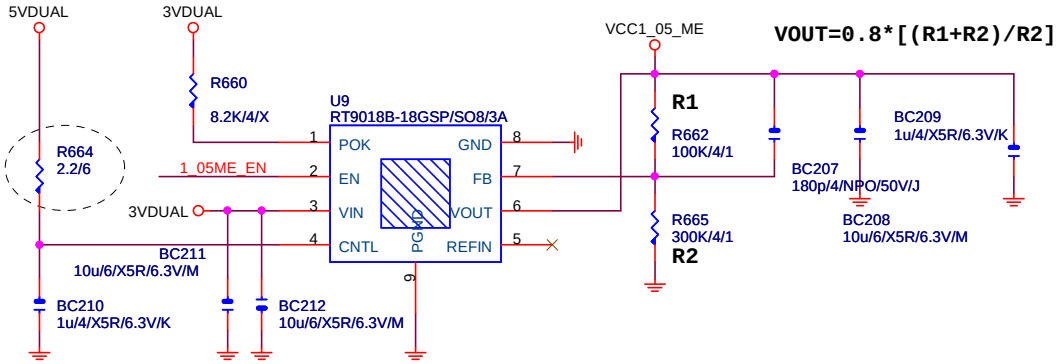
Rocset=(Iocp*Lgate,rdson)/Iocset
Rocset=(45A*6.7mOhm)/10uA = 30K
Iocset=10uA

Gigabyte Technology			
Title: DDR POWER			
Size: Custom	Document Number: GA-B85M-D3H		Rev: 2.1
Date: Thursday, January 08, 2015	Sheet 29 of 32		

VCC1_05_ME FOOT MASK

Z97 N/A

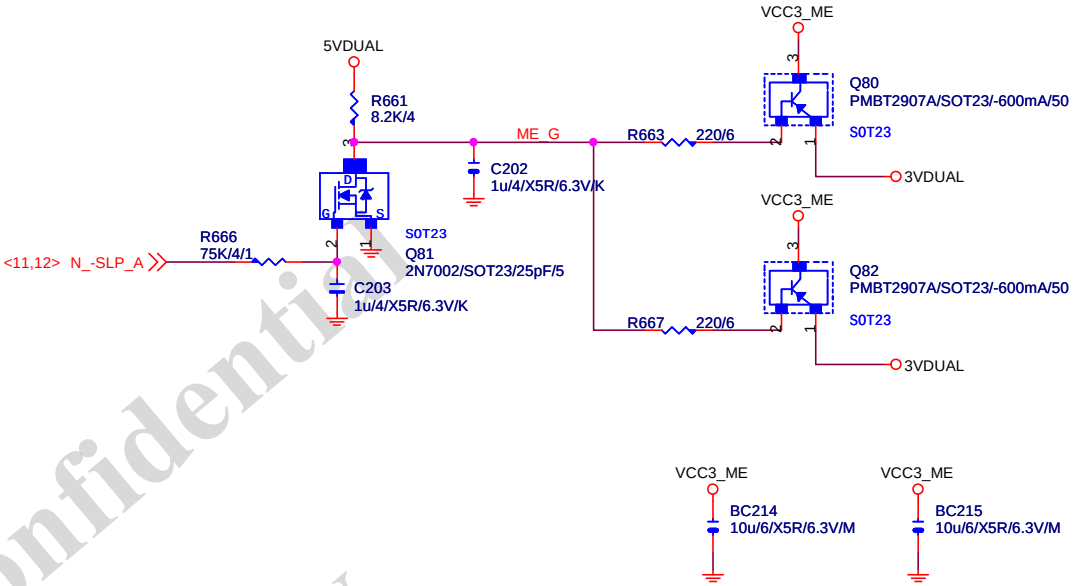
【技術通報R&D技術通報156】
(RICHTEK), (NUVOTON), (EMC)做共用
PIN7分壓阻值須做修改為100K以上電阻值



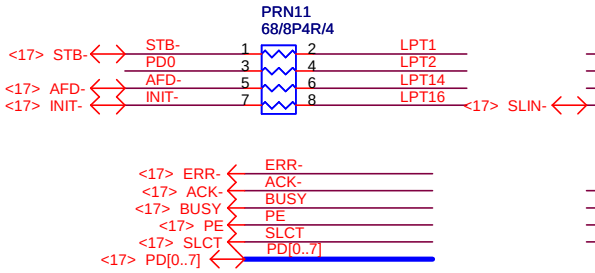
Second source
EM5103 - 10GL2-305103-01R
NCT3730S -
10GL2-303730-01R

VCC3_ME FOOT MASK

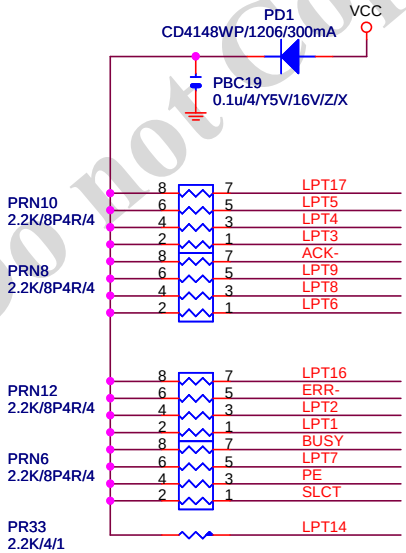
Z97 N/A

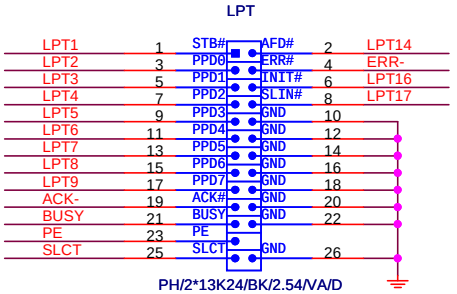


LPT PORT



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

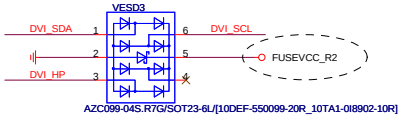




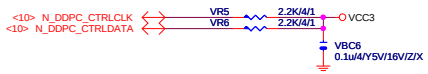
Gigabyte Technology

Title	LPT	
Size: Custom	Document Number: GA-B85M-D3H	Rev: 2.1
Date: Thursday, January 08, 2015	Sheet 30 of 32	

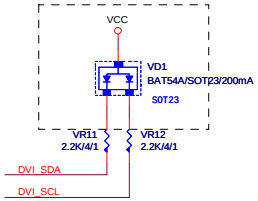
DVI LEVEL SHIFT

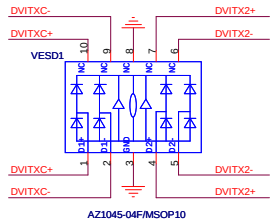


Close to connector

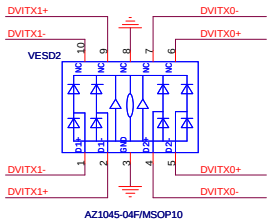


R&D技術通報 162

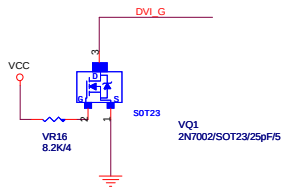


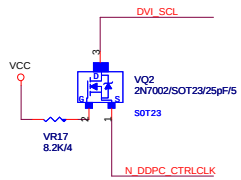


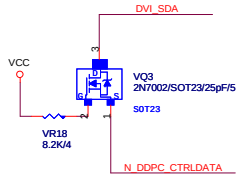
Close to connector

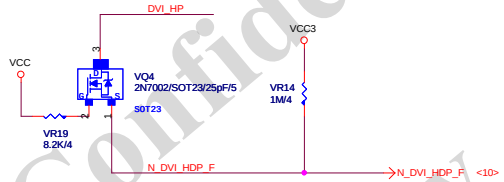


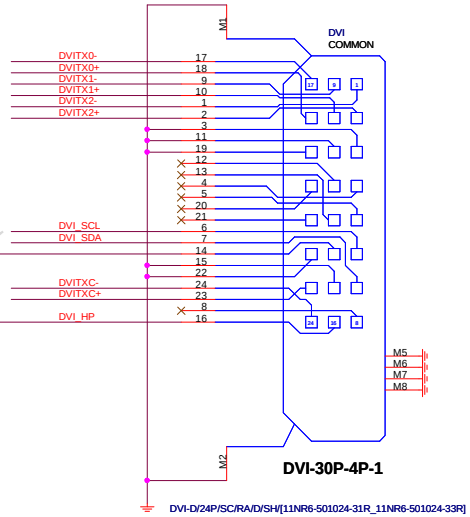
Close to connector



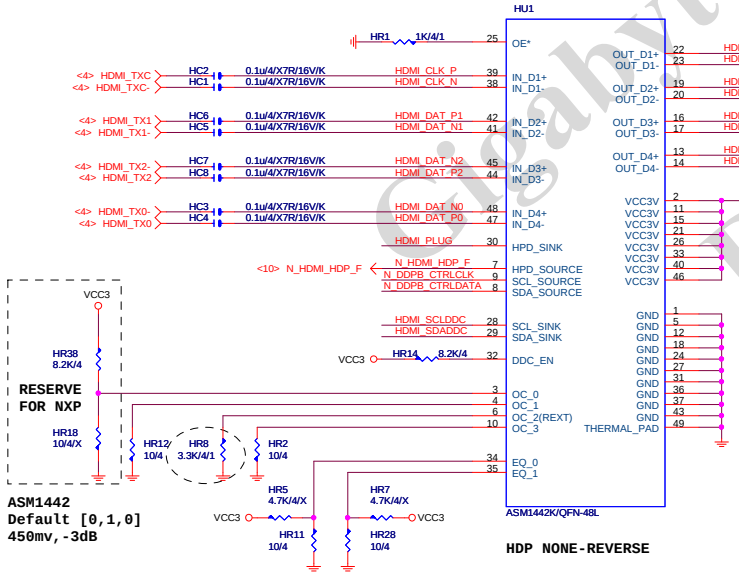


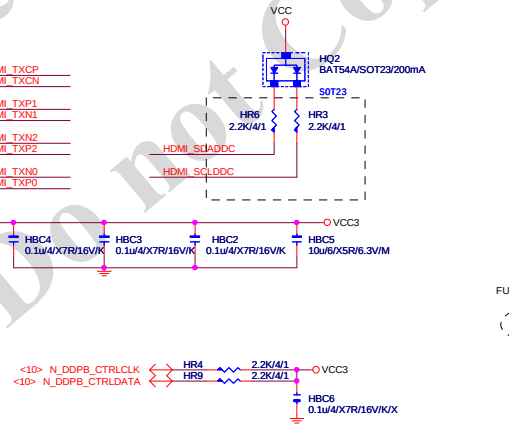


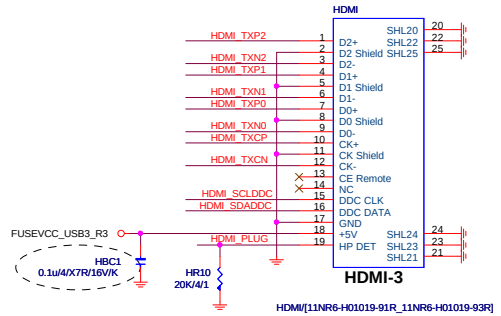




HDMI LEVEL SHIFT







Gigabyte Technology		
Title: DVI		
Size: Custom	Document Number: GA-B85M-D3H	Rev: 2.1
Date: Thursday, January 08, 2015	Sheet 31 of 32	

PCIE TO PCI

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

Co-Lay IT8893 (IT8893 CLKOUT1 N/A)

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

IT8892: PR46 -> X
IT8893: PR46 -> 0

IT8892: PR19 -> 0
IT8893: PR19 -> X

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

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

PU1 IT8892E/BX LQFP128

IT8892E/FX/S

IT8892

PCI slot

PCI slot

chipset side

PCB layout note:
Close to chip

PCB layout note:
Close to chip

Close to chip

Gigabyte Technology		
Title: ITE IT8892E		
Size: Custom	Document Number: GA-B85M-D3H	Rev: 2.1
Date: Thursday, January 08, 2015	Sheet 32 of 32	