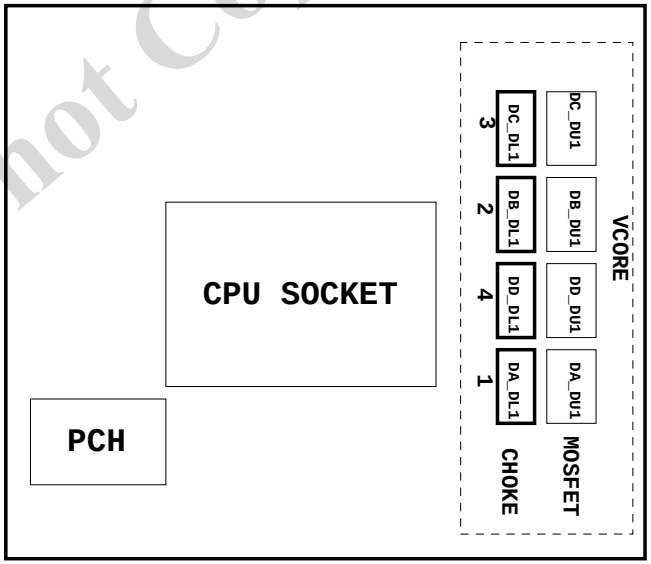
Model Name: GA-H97-HD3

1.01

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
10	PCH_RGB,CLK BUFFER
11	PCH_HOST,SATA,PCI
12	PCH_GPIO,CTRL,AUDIO
13	PCH_PWR,GND
14	PCI EXPRESS*16 SLOT
15	PCIEX1*2 , PCIEX4 SLOT
16	ITE8892 PCI BRIDGE
17	PCI SLOT 1&2
18	I/O ITE8620
19	COM, -PROHOT, R_USB
20	Dual BIOS / LPT
21	ALC887-VD2 CODEC
22	REAR AUDIO JACK
23	VCORE_ ISL95820_1
24	VCORE_ ISL95820_2
25	DDR15V / M3 POWER
26	NCP3933 OVER VOLTAGE
27	DISCRETE POWER

SHEET	TITLE
28	F_PANEL , F_USB2.0/3.0
29	ATX POWER, CLOCK GEN
30	HWM , KB/MS , FAN CTRL
31	Realtek 8111F-VL
32	DVI
33	HDMI
34	TABLE LIST
35	
36	
37	
38	
39	
40	



Gigabyte Technology

Title: Cover Sheet

Size: Custom | Document Number: GA-H97-HD3 | Rev: 1.01

Date: Wednesday, June 18, 2014 | Sheet 1 of 34

GA-H97-HD3

Component value change history

Data	Change Item	Reason
2013/11/07 EBOM:01	Z97-DS3H-0.1 E-BOM	
2014/01/07 EBOM:01	H97-HD3-0.1 E-BOM	
2014/01/07 EBOM:02	1.add level shift IC ,Q3,R34	
2014/02/17 EBOM:10A	1.VR11,VR12,HR2,HR3 28K--->2.2K;NR24 5.6K-->6.65K,NR23 8.2K--->10K	
	2.DEL UAU1(LM358),UAQ1,UAQ2,UAR2,UAR3,UABC7,UABC8,R34,Q3,	
	3.ESD PROTECT DIODE改爲用AMC099加強版	
	4.DEL FPR6,PAC1,PEC1,DQ19,DQ20,DR166,DR167,DR168	
	5.DAC4,DDC1,DCC1,DBC1 限用10UF/X6S	
2014/03/07 PBOM:10B	1.FOR SINGLE BOM	
	2.DAC4,DDC1,DCC1,DBC1 限用10UF/X6S,SAMSUNG/MURATA	
	H97 CHIP 的VCORE/NON VCORE MOS限用ON	
2014/04/15 PBOM:10C	H97 CHIP 的料號更換爲20R FOR MP	
2014/06/19 PBOM:10E	1.SATA / SATA Express remove MLCC,3.修改爲short pad + Mask ; PCB跳小版本(次版次)	

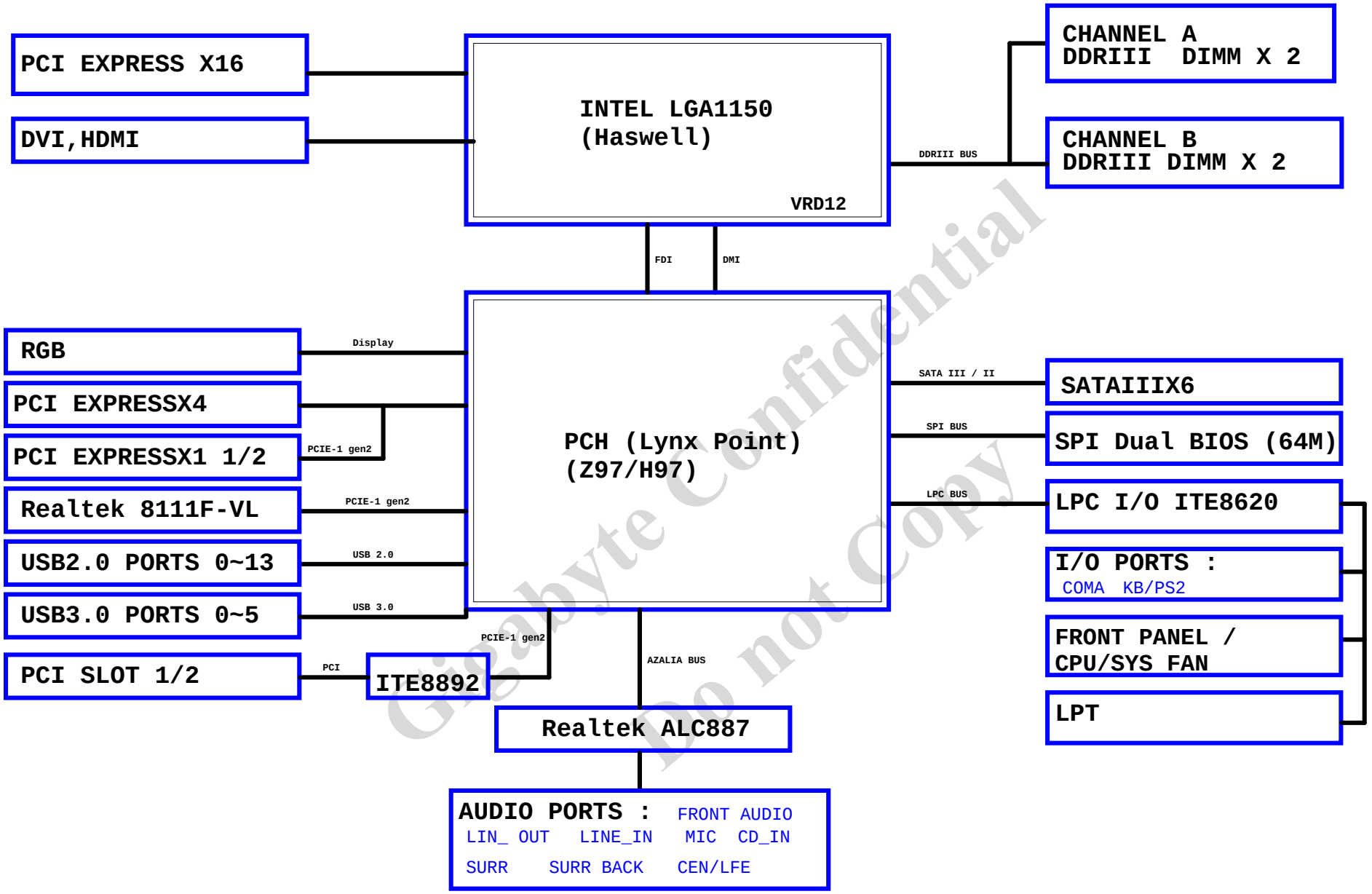
Circuit or PCB layout change

DATE	Change Item	Reason
2013/10/15 PCB:0.1	由Z87-DS3H-1.1修改 ----------->Z97-DS3H-0.1	
2013/12/30 PCB:0.1	由Z97-DS3H-0.1修改	
	1.Spec CHANGE 移除SPDIF IN PIN HEADER/THUNDERBALL PIN HEADER;USB two port one fuse	
	2.Spec CHANGE DEL DVI level shift IC,OR68	3.add HBD3 防VGA CONTROL PIN漏電
	4.R676/R692 0603 ---->0603 SHORT-WIRE	5.update PCH heatsink footprint
	6.CR60/R200 0402 ---->SHORT MASK	8.修改HDLED線路;NOTE1202
	7.CR51/DCR2/DDR2/DBR2/DAR2/DDR9 0603----->0603 SHORT MASK	
	9.修正HD /POWER LED SCH	10.Swap DVI & HDMI port
	11.USB2.0/3.0 Signal & power short protection sch	12.CPU MOS改1上1下 FOR H97 SPEC
	13.OR68(CPU RESET) 不上件	14.F_USB30 ESD PROTECT(UAE1,UAE2,UAESD4)改成AZ1065
2014/01/09 PCB:0.2	1.Spec CHANGE add DVI level shift IC	
	2.統一,PWM_TEMP跟CPU_TEMP互換,同時PWM_TEMP換成PCH_TEMP	
	3.預留NR136電阻,NR205 OPEN	
2014/02/11 PCB:1.0	1.DAQ4,DBQ4,DCQ4,DDQ4 MASK	
	2.U9,U10,BC30,BC26,R62,R63,R39,R40 MASK	
	3.UAU1,UAQ1,UAQ2,UAR2,UAR3,UABC7,UABC8 MASK	
	4.LBESD1 MASK	
	5.NR205 SHORT ,R34,Q3 MASK	
	6.DQ19,DQ20,DR166,DR167,DR168 MASK	
2014/06/18 PCB:1.01	1.SATA / SATA Express remove MLCC,3.修改爲short pad + Mask ; PCB跳小版本(次版次)	

Gigabyte Technology

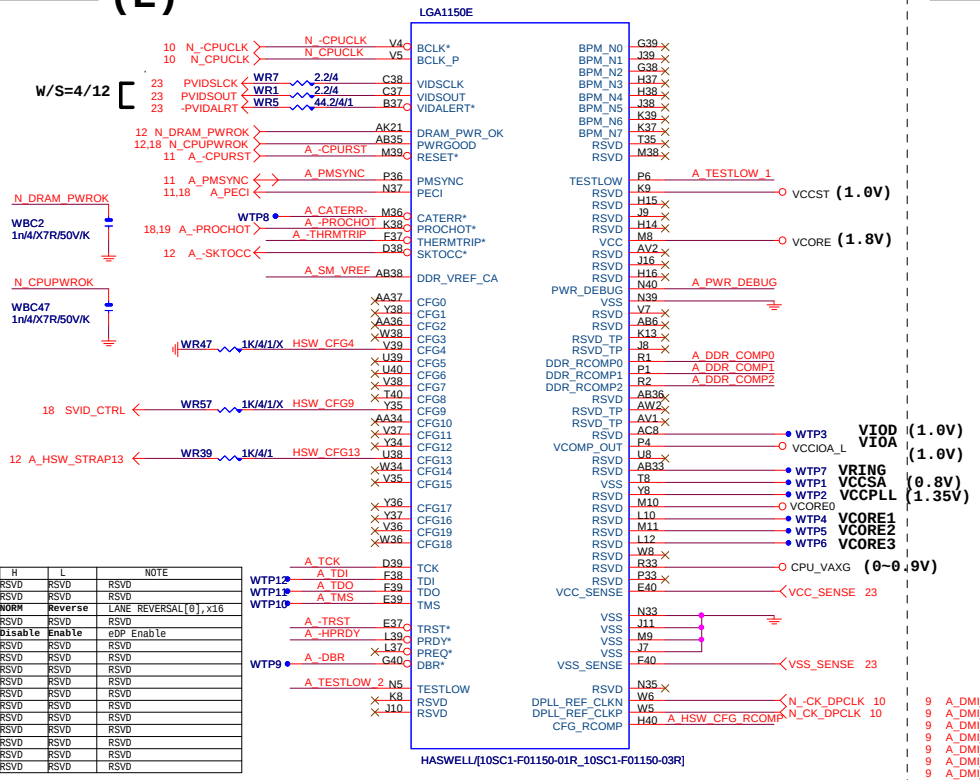
Title: BOM & PCB MODIFY HISTORY			
Size: Custom	Document Number: GA-H97-HD3		Rev: 1.01
Date: Wednesday, June 18, 2014		Sheet 2 of 34	

BLOCK DIAGRAM



Gigabyte Technology			
Title: BLOCK DIAGRAM			
Size: C	Document Number: GA-H97-HD3		Rev: 1.01
Date: Wednesday, June 18, 2014	Sheet 3 of 34		

LGA1150 (E)

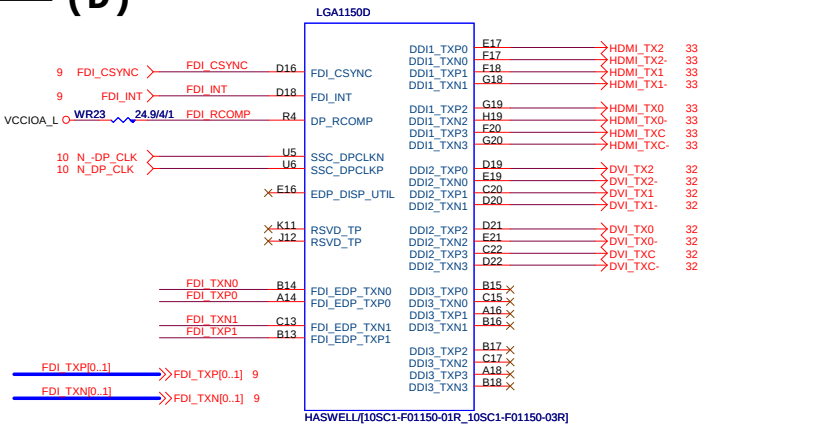


CFG	H	L	NOTE
0	RSVD	RSVD	RSVD
1	RSVD	RSVD	RSVD
2	**NORM**	**Reverse**	LANE REVERSAL[0],x16
3	RSVD	RSVD	RSVD
4	**Disable**	**Enable**	eDP Enable
7	RSVD	RSVD	RSVD
8	RSVD	RSVD	RSVD
9	RSVD	RSVD	RSVD
10	RSVD	RSVD	RSVD
11	RSVD	RSVD	RSVD
12	RSVD	RSVD	RSVD
13	RSVD	RSVD	RSVD
14	RSVD	RSVD	RSVD
15	RSVD	RSVD	RSVD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

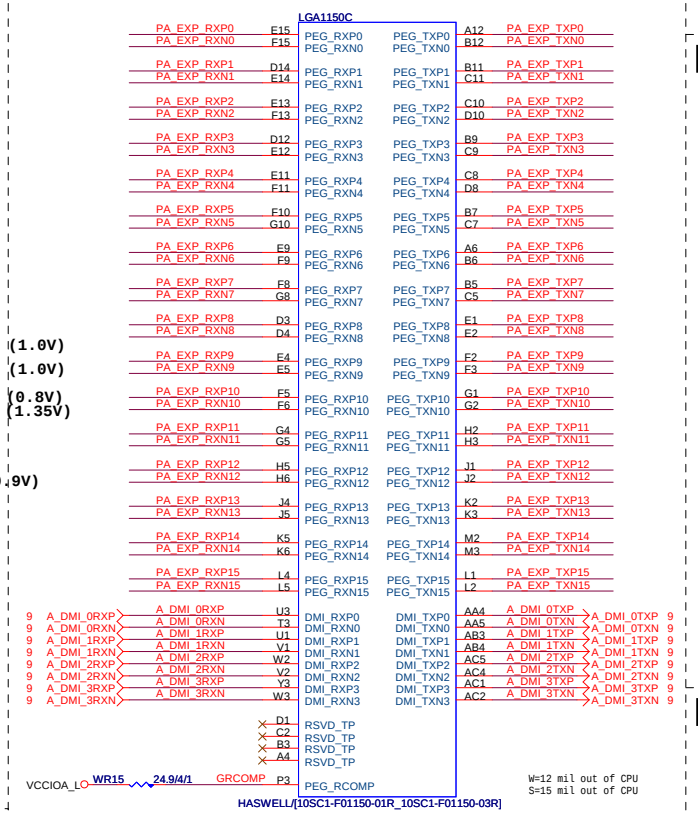


FDI:4/4/4//15(breakout min 4/4/4//8)
Impedance=85 +- 15%

DP/HDMI 4/4/4//20 FDI 4/4/4/12

Impedance=85 +- 15%

LGA1155 (C)

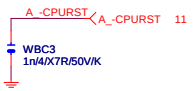


CPU PEG 5/5/5//20 Impedance=80 +- 15%

DMI 4/4/4//15 Impedance=85 +- 15%

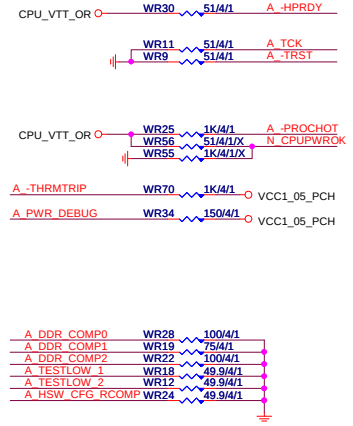
-CPURST

1.1V分壓

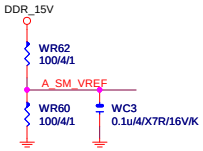


CPU SVID

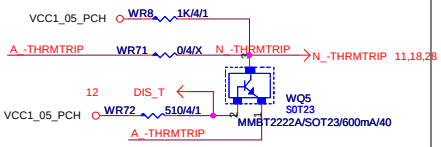
CPU PU/PD



SM REF



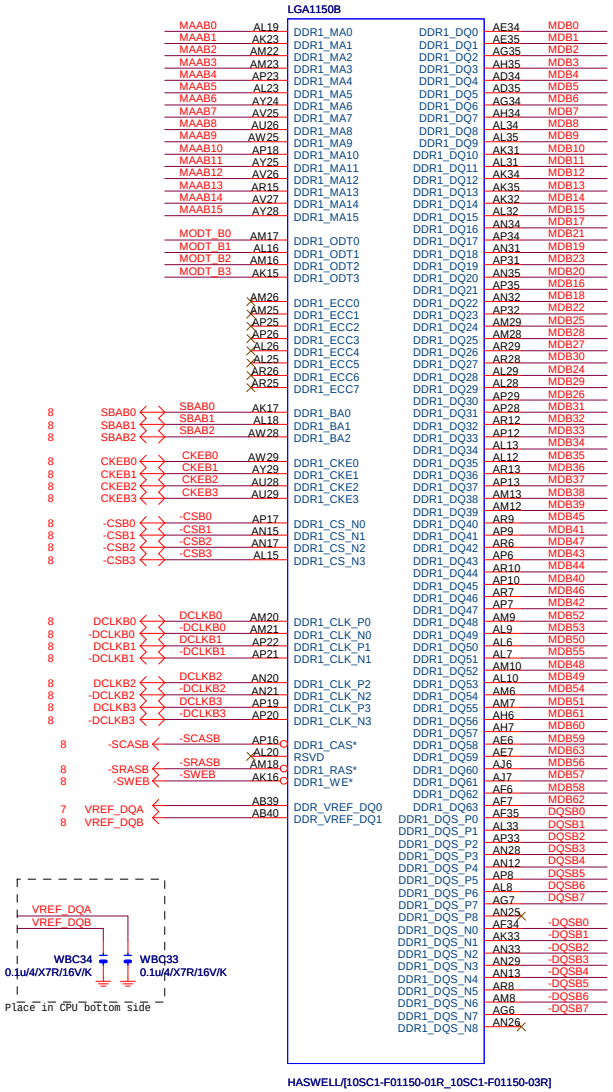
THRMTRIP DISABLE FOR Z87 OVERCLOCK



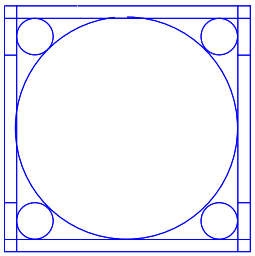
Gigabyte Technology			
Title: CPU LGA1150-A			
Size: Custom	Document Number: GA-H97-HD3		Rev: 1.01
Date: Wednesday, June 18, 2014	Sheet 4 of 34		

LGA1150 (A)

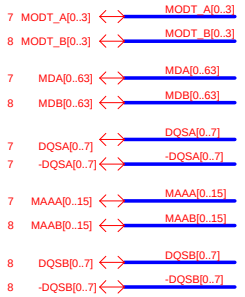
LGA1150 (B)



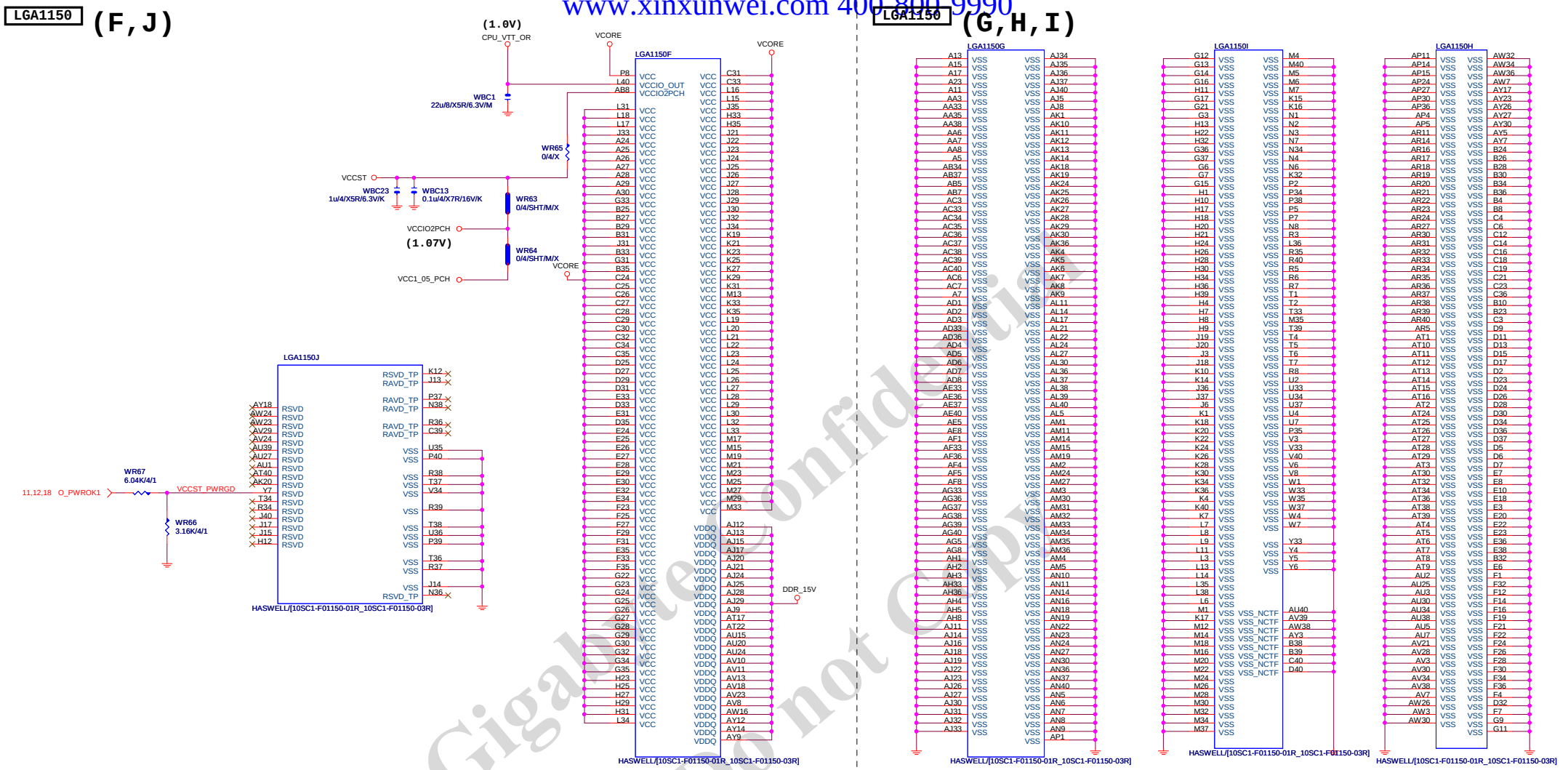
LGA1150 (CR)



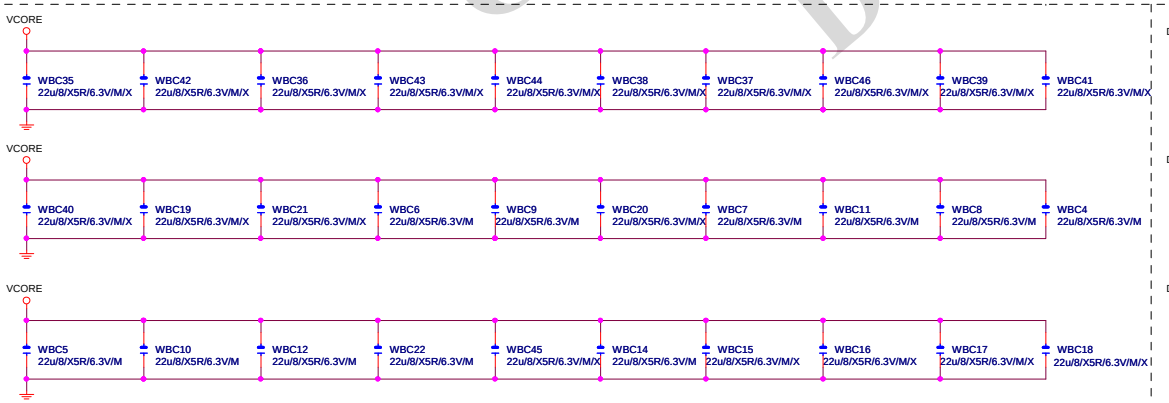
DDR BUS



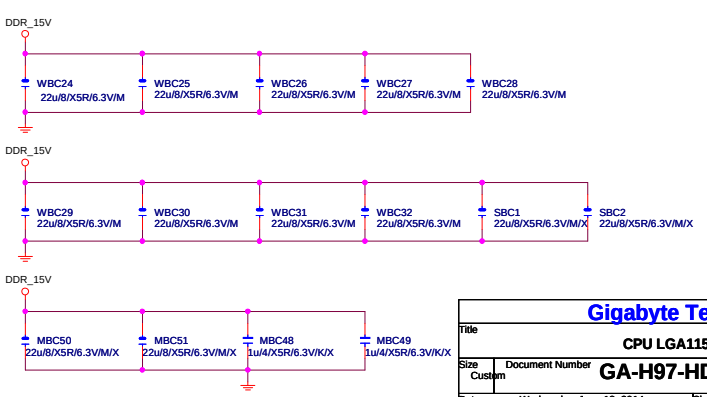
Company	Gigabyte Technology
Title	CPU LGA1150-B
Size	Custom
Document Number	GA-H97-HD3
Rev	1.01
Date:	Wednesday, June 18, 2014
Sheet	5 of 34



VCore CAP (X30)



DDR CAP (X15)



Gigabyte Technology			
Title: CPU LGA1150-C			
Size: Custom	Document Number: GA-H97-HD3		Rev: 1.01
Date: Wednesday, June 18, 2014	Sheet 6 of 34		

DDR3 (A)

DDR3_4

DDRVTT
VTT
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
DM1/DQS10
DM2/DQS11
DM3/DQS12
DM4/DQS13
DM5/DQS14
DM6/DQS15
DM7/DQS16
DM8/DQS17
VDD
VDDSPD
VREFCA
VREFDQ
SCL
SDA
SA1
SA0
BA2
BA1
BA0
CKE1
CKE0
S1*
CK1/NU*
CK1/NU
CK0*
CK0
A0
A1
A2
A3
A4
A5
A6
A7
A8
A9
A10/AP
A11
A12
A13
A14
A15
RESET*
CAS*
RAS*
WE*
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

MODT_A[0..3] 5
-DQSA[0..7] 5
DQSA[0..7] 5

-DDR3_RST
MC6 100p/4/NPO/50V/J
N_SMBDATA
N_SMBCLK
MC10 100p/4/NPO/50V/J/X
MC11 100p/4/NPO/50V/J/X

VDDSPD SHORT PROTECT
R0402-2
VCC3
VDDSPD
MF1 SPR-P200T/6V/B/S

MC4 0.1u/4/X7R/16V/K
MC5 0.1u/4/X7R/16V/K VREF_DDRA
MC1 0.1u/4/X7R/16V/K VREF_DQDDRA

8,12,14,15,17,23,26 N_SMBCLK
8,12,14,15,17,23,26 N_SMBDATA
SBAA2
SBAA1
SBAA0
CKEA1
CKEA0
-CSA1
-CSA0
-DCLKA1
DCLKA1
-DCLKA0
DCLKA0
MAAA[0..15]
5,8 -DDR3_RST
-SCASA
-SRASA
-SWEA

MDA[0..63] 5

DDR3/240/BK/VA/D

DDR3_2

DDRVTT
MODT_A3
MODT_A2
MDA[0..63] 5
DDR3/240/GR/VA/D

DDR3_VREF

DDR_15V
MR15 1K/4/1
MR13 0/4/SHT/X
MR14 1K/4/1
VREF_DDRA
M_VREFCA_A 26

MBC28 1u/4/X5R/6.3V/K
MR4 1K/4/1
MR5 1K/4/1
VREF_DQDDRA
MR1 10/4
MR3 10/4/X
VREF_DQA 5
VREF_DQA_ADJ 26

DDR TERMINATION CHANNEL A/B

DDR15V Decouple

MEC1 560u/FP/D/6.3V/69/A/11m
MEC2 560u/FP/D/6.3V/69/A/11m
MEC3 560u/FP/D/6.3V/69/A/11m
MBC43 22u/8/X5R/6.3V/M
MBC44 22u/8/X5R/6.3V/M

DDRVTT Decouple

MBC39 22u/8/X5R/6.3V/M
MBC40 22u/8/X5R/6.3V/M

MBC5 0.1u/4/X7R/16V/K
MBC6 0.1u/4/X7R/16V/K
MBC7 0.1u/4/X7R/16V/K
MBC8 2.2u/6/X5R/6.3V/K

MBC18 0.1u/4/X7R/16V/K
MBC26 0.1u/4/X7R/16V/K
MBC41 0.1u/4/X7R/16V/K

MBC4 1u/4/X5R/6.3V/K
MBC10 1u/4/X5R/6.3V/K

MBC9 1u/4/X5R/6.3V/K
MBC11 1u/4/X5R/6.3V/K
MBC12 1u/4/X5R/6.3V/K
MBC13 1u/4/X5R/6.3V/K
MBC14 1u/4/X5R/6.3V/K
MBC15 1u/4/X5R/6.3V/K
MBC16 1u/4/X5R/6.3V/K
MBC17 1u/4/X5R/6.3V/K
MBC19 1u/4/X5R/6.3V/K
MBC20 1u/4/X5R/6.3V/K
MBC21 1u/4/X5R/6.3V/K
MBC22 1u/4/X5R/6.3V/K
MBC23 1u/4/X5R/6.3V/K

MBC24 1u/4/X5R/6.3V/K
MBC25 1u/4/X5R/6.3V/K
MBC27 1u/4/X5R/6.3V/K
MBC29 1u/4/X5R/6.3V/K
MBC30 1u/4/X5R/6.3V/K
MBC31 1u/4/X5R/6.3V/K
MBC32 1u/4/X5R/6.3V/K
MBC33 1u/4/X5R/6.3V/K
MBC34 1u/4/X5R/6.3V/K
MBC35 1u/4/X5R/6.3V/K
MBC36 1u/4/X5R/6.3V/K
MBC37 1u/4/X5R/6.3V/K
MBC47 1u/4/X5R/6.3V/K

Company	Gigabyte Technology
Title	DDRIII CHANNEL A
Size	Custom
Document Number	GA-H97-HD3
Rev	1.01
Date:	
Sheet	7 of 34

DDR3 (B)

DDR3_3

DDRVTT

DDR_15V

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

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

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

VDDSPD

DDR3/240/BK/VA/D

DDR3

DDR3_1

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

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

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

DDR3/240/GR/VA/D

DDR3 VREF

DDR_15V

MR10 1K/4/1

VREF_DDRB MR12 0/4/SHT/X M_VREFCA_B 26

MR11 1K/4/1

DDR_15V

MR8 1K/4/1

VREF_DQDDRB MR7 10/4 VREF_DQB 5

MR16 10/4/X VREF_DQB_ADJ 26

MR9 1K/4/1

DDR3 1066,1333,1600MHZ BANDWIDTH

DDR3 1066MHZ
DDR3 clock=533MHZ
DDR3 single channel bandwidth=533x2x8Byte=8.5GB/s
DDR3 dual channel bandwidth=533x2x2x8Byte=17GB/s

DDR3 1333MHZ
DDR3 clock=667MHZ
DDR3 single channel bandwidth=10.6GB/s
DDR3 dual channel bandwidth=21GB/s

DDR3 1600MHZ
DDR3 clock=800MHZ
DDR3 single channel bandwidth=12.8GB/s
DDR3 dual channel bandwidth=25.6GB/s

COUPON

COUPON1 COUPON1 1 2 COUPON/X

COUPON2 COUPON2 1 2 COUPON/X

CPU

DIMM4
DIMM2
CHA

DIMM3
DIMM1
CHB

Gigabyte Technology

Title: DDRIII CHANNEL B

Size: Custom | Document Number: GA-H97-HD3 | Rev: 1.01

Date: | Sheet 8 of 34

PCH (B)

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

USB2.0 : 12/5/7/5/12 (breakout min 8/4/4/4/8)
Impedance=85 +- 15%

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

A_DMI_0TXN A_DMI_0TXP A_DMI_0RXN A_DMI_0RXP
A_DMI_1TXN A_DMI_1TXP A_DMI_1RXN A_DMI_1RXP
A_DMI_2TXN A_DMI_2TXP A_DMI_2RXN A_DMI_2RXP
A_DMI_3TXN A_DMI_3TXP A_DMI_3RXN A_DMI_3RXP

VCC1_5_PCH
NR50 7.5K/4/1 DMI_COMP
NR40 7.5K/4/1 PCIE_COMP
W=8 mil out of PCH
S=15 mil to other signals

DMI_RCOMP
PCIE_RCOMP
CK_-SRCCLK_PCH
CK_SRCCLK_PCH
CLKIN_DMI_N
CLKIN_DMI_P

USBN_0 USBP_0 USBN_1 USBP_1 USBN_2 USBP_2 USBN_3 USBP_3 USBN_4 USBP_4 USBN_5 USBP_5 USBN_6 USBP_6 USBN_7 USBP_7 USBN_8 USBP_8 USBN_9 USBP_9 USBN_10 USBP_10 USBN_11 USBP_11 USBN_12 USBP_12 USBN_13 USBP_13

AV10 AU10 AV11 AW11 AN14 AP14 AJ16 AK16 AU15 AV15 AU12 AT12 AV14 AW14 AU17 AT17 AW16 AV16 AN16 AP16 AJ18 AK18 AP18 AN18 AW18 AV18 AP20 AN20

N_-USBP0 N_+USBP0 N_-USBP1 N_+USBP1 N_-USBP2 N_+USBP2 N_-USBP3 N_+USBP3 N_-USBP4 N_+USBP4 N_-USBP5 N_+USBP5 N_-USBP6 N_+USBP6 N_-USBP7 N_+USBP7 N_-USBP8 N_+USBP8 N_-USBP9 N_+USBP9 N_-USBP10 N_+USBP10 N_-USBP11 N_+USBP11 N_-USBP12 N_+USBP12 N_-USBP13 N_+USBP13

Port要對應

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

REAR USB3.0
B85/H81:USB 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

31 PCH_USB3_RXN2 31 PCH_USB3_RXP2 31 PCH_USB3_TXN2 31 PCH_USB3_TXP2
31 PCH_USB3_RXN3 31 PCH_USB3_RXP3 31 PCH_USB3_TXN3 31 PCH_USB3_TXP3

LAN AR8161

31 LB_ML_IN 31 LB_ML_IP 31 LB_ML_ON 31 LB_ML_OP

ITE8892 PCI Bridge

16 G_PCIEBIN 16 G_PCIEBIP 16 G_PCIEBON 16 G_PCIEBOP

PCIEX4 port1

15 PE_PCIE_IN1 15 PE_PCIE_IP1 15 PE_PCIE_TN1 15 PE_PCIE_TP1

PCIEX4 port2

15 PF_PCIE_IN2 15 PF_PCIE_IP2 15 PF_PCIE_TN2 15 PF_PCIE_TP2

PCIEX4 port3
PCIEX1_1

15 PI_PCIE_IN3 15 PI_PCIE_IP3 15 PI_PCIE_TN3 15 PI_PCIE_TP3

H81:PCIE 7/8X
PCIEX4 port4
PCIEX1_2

15 PJ_PCIE_IN4 15 PJ_PCIE_IP4 15 PJ_PCIE_TN4 15 PJ_PCIE_TP4

放靠近 Device & PCI-E Slot

CHIP DH82H97 A0 INTEL/[10HB1-030H97-20R]

OC0B_GP59 OC1B_GP40 OC2B_GP41 OC3B_GP42 OC4B_GP43 OC5B_GP9 OC6B_GP10 OC7B_GP14

AE40 AF37 AD39 AD40 AF39 AC41 AF40 AG40

N_-USBOC_F 28
N_-USBOC_R 28,31
N_GPIO14

USBRBIASB USBRBIAS

AV20 AU20 N_USBRBIAS NR47 22.6/4/1
W=8 mil out of PCH
S=15 mil to other signals

AP11 CK_-DOTCLK
AM11 CK_DOTCLK

CLKIN_DOT96N CLKIN_DOT96P

N_GPIO14 NR130 8.2K/4 3VDUAL

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

PCH PCIE ,DMI 4/4/4//15 Impedance=85 +- 15%
usb2.0 5/7/5//12
usb3.0 5/7/5//20 Impedance=85 +- 15%

PCH (F)

PCHF

USB3 FDILINK

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

FDI_RXN_0 FDI_RXP_0 FDI_RXN_1 FDI_RXP_1

FDI_CSYNC FDI_INT FDI_RCOMP

TACH6_GP70 TACH7_GP71

28 PCH_USB3_RXN0 28 PCH_USB3_RXP0 28 PCH_USB3_TXN0 28 PCH_USB3_TXP0
28 PCH_USB3_RXN1 28 PCH_USB3_RXP1 28 PCH_USB3_TXN1 28 PCH_USB3_TXP1
19 PCH_USB3_RXN4 19 PCH_USB3_RXP4 19 PCH_USB3_TXN4 19 PCH_USB3_TXP4
19 PCH_USB3_RXN5 19 PCH_USB3_RXP5 19 PCH_USB3_TXN5 19 PCH_USB3_TXP5

F20 G20 B18 C18 G18 H18 B15 B16 K20 L20 D15 C15 L18 K18 B14 A14

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

FDI_CSYNC 4
FDI_INT 4

FDI:12/4/5/4/12
Impedance=85 +- 17.5%

H81:USB3.0 N\A

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

CHIP DH82H97 A0 INTEL/[10HB1-030H97-20R]

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

CK_SRCCLK_PCH NR89 8.2K/4
CK_-SRCCLK_PCH NR88 8.2K/4
Mount for integrated clock Generation Mode

CK_DOTCLK NR92 8.2K/4
CK_-DOTCLK NR91 8.2K/4
NR92 short to GND in non graphic SKU

PCH (J)

PCHJ

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

TP22 TP23 TP21 TP20 TP14 TP15 TP12 TP10 TP11 TP9 TP3 TP4 TP1 TP2 TP5 TP6 TP7 TP8

U11 U10 AJ14 AK14 K34 K33 AH24 L16 K16 AM34 R12 N12 L22 K22 R4 K5 P5 L5

VSS: AC31 AF3 AV21

CHIP DH82H97 A0 INTEL/[10HB1-030H97-20R]

PCH H/S

BGAHSINK_SB-9M

PCH_HS

HEAT SINK/N-BG/GBT MK/Z87/KWOG/[12SP2-S04208-91R_12SP2-S04208-92R_12SP2-S04208-93R]

USB TABLE

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

USB OC#	Configure
OC0#	USB0,1
OC1#	USB2,3
OC2#	USB4,5
OC3#	USB6,7
OC4#	USB8,9
OC5#	USB10,11
OC6#	USB12,13
OC7#	Not Use

Gigabyte Technology

Title: PCH FDI,DMI,USB ,PCIE

Size: Custom | Document Number: GA-H97-HD3 | Rev: 1.01

Date: Wednesday, June 18, 2014 | Sheet 9 of 34

PCH (E)

PCHE

CHIP DH82H97 A0 INTEL/[10HB1-030H97-20R]

CLOSE PCH<0.75";4/10;+-1000;GND

VGA 4/20;+-200MILS;GND REF

DDC DIFF 4/5;+-1000

IREF 4/12;<500MILS;GND

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)

PCHG

CHIP DH82H97 A0 INTEL/[10HB1-030H97-20R]

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

PCIXx16

PCIXx1_2

lan 8111F-VL

ITE8892

PCIXx4

PCIXx1_1

CRYSTAL/TRACE 週邊不要有訊號,VIA靠近

PCIEX4 CLOCK(PE_SRCCLK_3GIO1)由PIN R6,R7 換成PIN W7,W6 避免跟CRYSTAL 25MHZ干擾

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

PCH CLK PD

Mount for integrated clock Generation Mode

VGA DDC

防漏電

VGA CONNECTOR

VGA/BK/SC/RA/D/2/HR

VGA ESD

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

SSOP6_ESD

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

VGA DDC

Close to PCH

Close to VGA connector

Gigabyte Technology		
Title: PCH DISPLAY ,CLK BUFFER		
Size: Custom	Document Number: GA-H97-HD3	Rev: 1.01
Date: Wednesday, June 18, 2014	Sheet 10 of 34	

PCH (C)

SATA3 : 20/4/4/4/20 (breakout min 8/4/4/4/8)
Impedance=85 +- 17.5%

SATA2 4/4/4//15
SATA3 4/4/4//20

PCHC

CHIP DH82H97 A0 INTEL/[10HB1-030H97-20R]

B85 6G
H81 6G
H81 X
B85/H81 3G

PCH (A)

PCHA

CHIP DH82H97 A0 INTEL/[10HB1-030H97-20R]

BOOT DEVICE	GP51	GP19
LPC	0	0
SPI	float	float

Default int pull up on GP51,
Default SPI boot devices

PCH CLK PD

Mount for integrated clock Generation Mode

PCH PU/PD

ME PWROK

TLS Setting enable for SBA

SATA CONNECTOR

White connector for SATA3

SATA所有電容改SHORT-PAD MASK

SATA所有電容改SHORT-PAD MASK

[Z87/H87] all SATA3
SATA3(From Z87) - 黑色
SATA3(From Marvell) - 灰色
[B85] SATA2+SATA3
SATA2(From B85) - 黑色
SATA3(From B85) - 白色

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

H81 Port 2/3 N/A

GPIO38 Ctrl

MFG Mode

N_GPIO38 : Lo --> Enable
Hi --> Disable

soft strap	GP16	GP49
0	pcie1	pcie2
1	sata4	sata5

Gigabyte Technology

Title: PCH HOST , SATA, PCI

Size: Custom | Document Number: GA-H97-HD3 | Rev: 1.01

Date: Wednesday, June 18, 2014 | Sheet 11 of 34

PCH (D)

PCHD

CHIP DH82H97 A0 INTEL/[10HB1-030H97-20R]

ACZ_SDOUT

C_ACZ_SDOUT : HI --> ME Enable
Lo --> ME Disable
HI:disable ME and override SPI Flash Access Permissions

PCH_DPWROK

At least 10ms delay after 3VDUAL_PCH stabel

For IT8620 Ctrl

PCH PU/PD

HSW_STRAP13

32.768KHZ

CLR_CMOS

BATTERY-DUAL-4

RB 必須放在BAT外

N_INTERMEN : Integrated 1.05V SUS VRM Enable

Title	PCH GPIO , CTRL , AUDIO
Size	Custom
Document Number	GA-H97-HD3
Rev	1.01
Date:	Wednesday, June 18, 2014
Sheet	12 of 34

Gigabyte Technology

PCH (H)

VCC3_DAC

CLOSE北橋(注意震盪水波紋)

3VDUAL_PCH

SHT PWR

CAP

(3.3V)(X6)

(1.05V)(X5)

(1.05V)(X6)

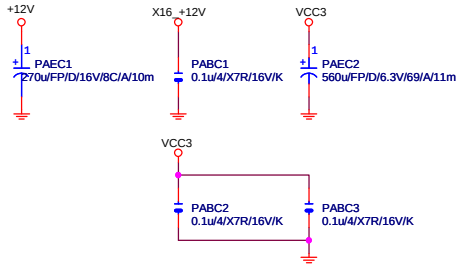
(1.05V)(X2)

(3.3V)(X2)

(1.5V) (X10)

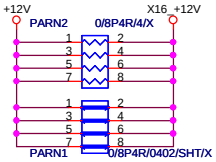
PCH (I)

PCIEX16 CAP



PCIEX16 PROTECT SHT

+12 protect
short-wire test



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

PCI-E REV:1.1--> 2.5GHZ

PCE-E X1(單向) BANDWITH=2.5GHz*(8b/10b)=2Gb/s=250MB/s

PCE-E X1(雙向) BANDWITH=2.5GHz*(8b/10b)X2=4Gb/s=500MB/s

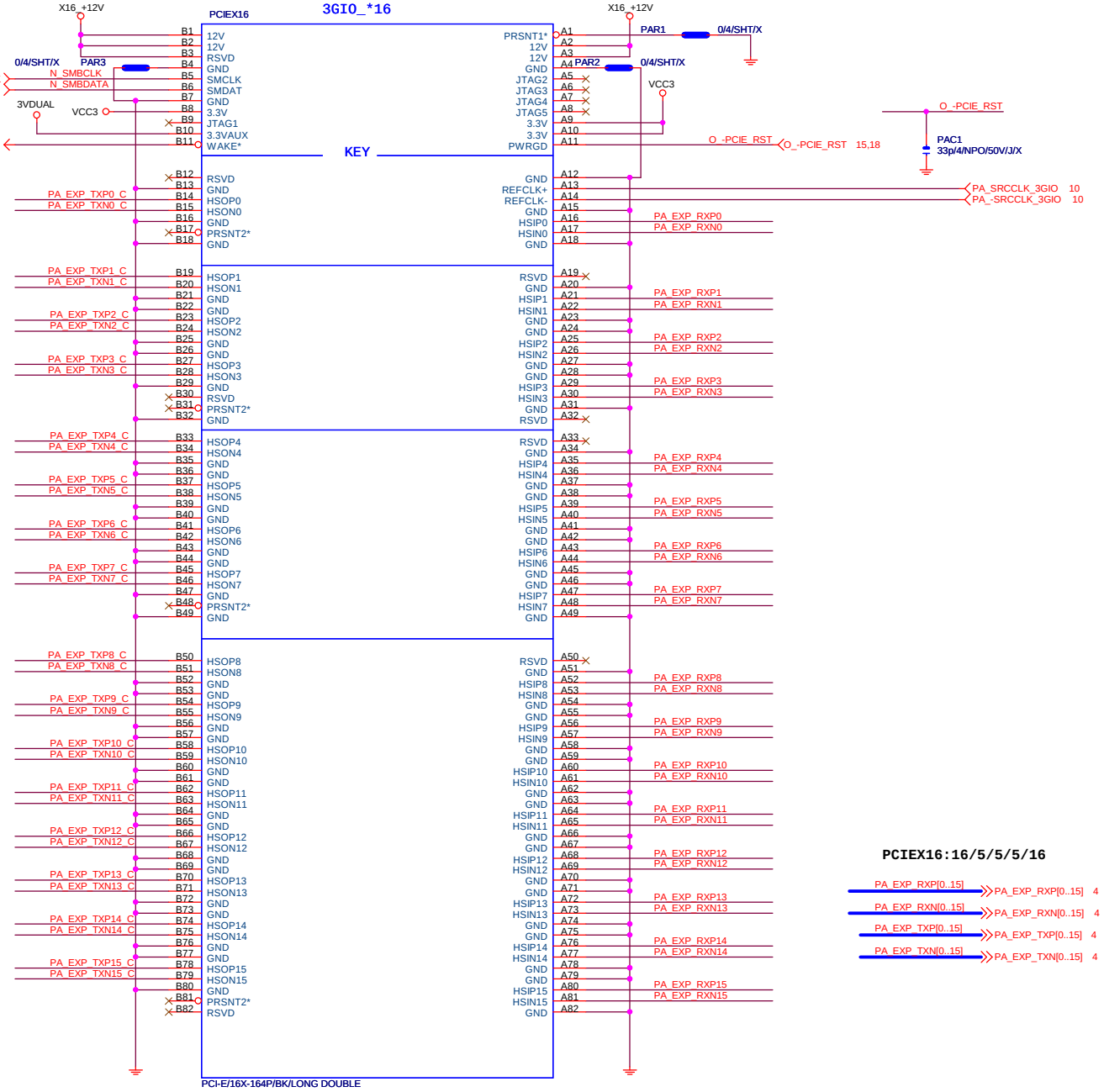
PCE-E X16(單向) BANDWITH=2.5GHz*(8b/10b)X16=32Gb/s=4GB/s

PCE-E X16(雙向) BANDWITH=2.5GHz*(8b/10b)X16X2=64Gb/s=8GB/s

PCI-E REV:2.0--> 5GHZ

PCIEX16 SLOT

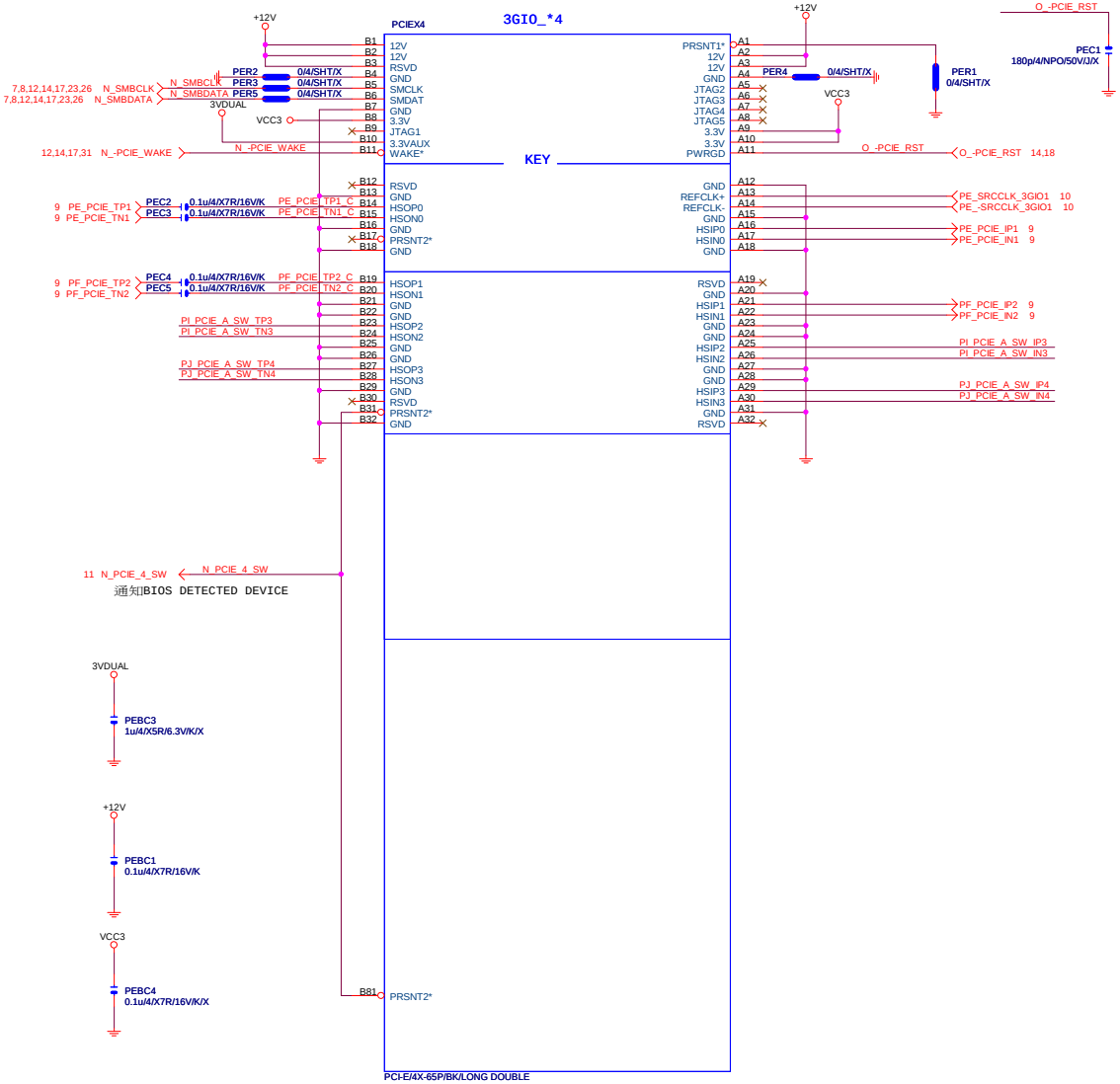
PCIESLOT-164DN-Q



PCIEX16:16/5/5/5/16

Gigabyte Technology			
Title: PCI EXPRESS * 16			
Size: Custom	Document Number: GA-H97-HD3		Rev: 0.2
Date: Wednesday, June 18, 2014	Sheet 14 of 34		

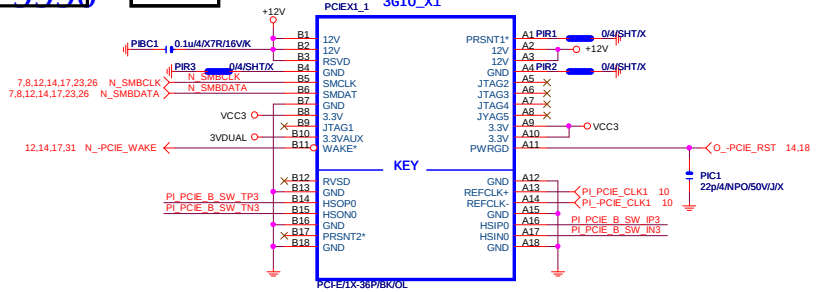
PCIEX4 SLOT



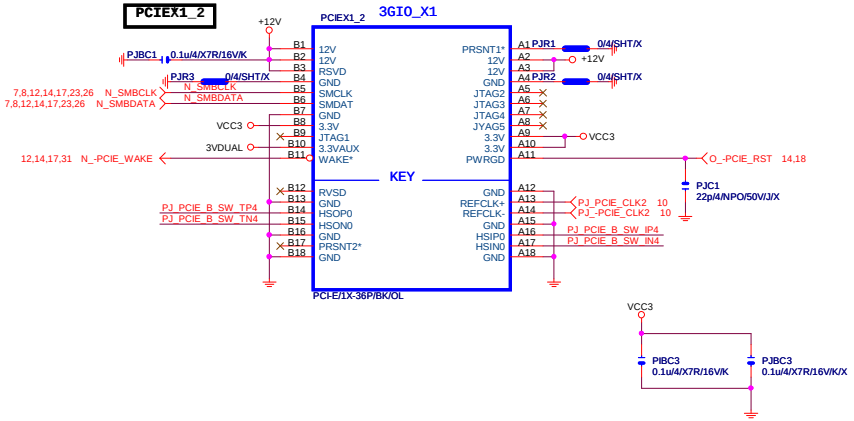
PCIEX4 SLOT	N_PCIE_4_SW (PCH GPIO48)	PCIEX4_X1 (SIO_GPIO26)
PCIEX4 No devices	H	H
PCIEX4 -> X1	H	H
PCIEX4 Have devices	L	L
PCIEX4 -> X4		
PCIEX1_1/2 --> N/A		

PCIEX1 SLOT

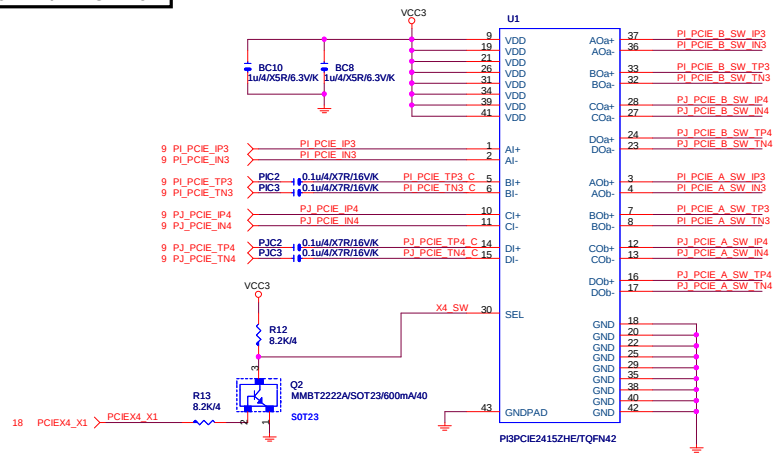
PCIEX1_1



PCIEX1_2



PCIEX4/X1 SWITCH



Algorithm 是先 check X4 有沒有卡. 決定要 1個 X4(X4卡優先) or 4 個 x1.

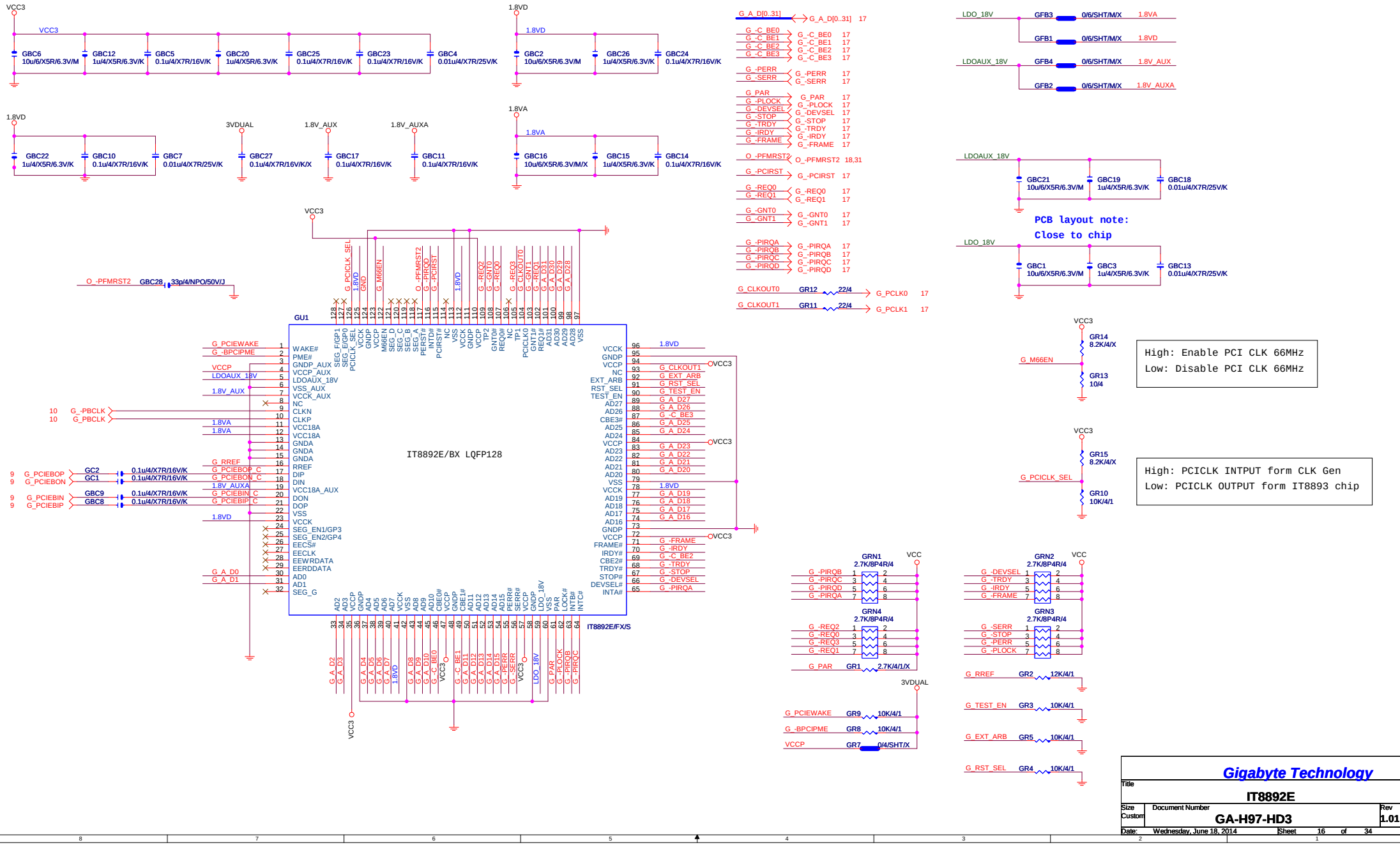
Function	SEL
xI--> xOa	L;PCIEX4 SLOT-->X1
xI--> xOb	H;PCIEX4 SLOT-->X4

Gigabyte Technology

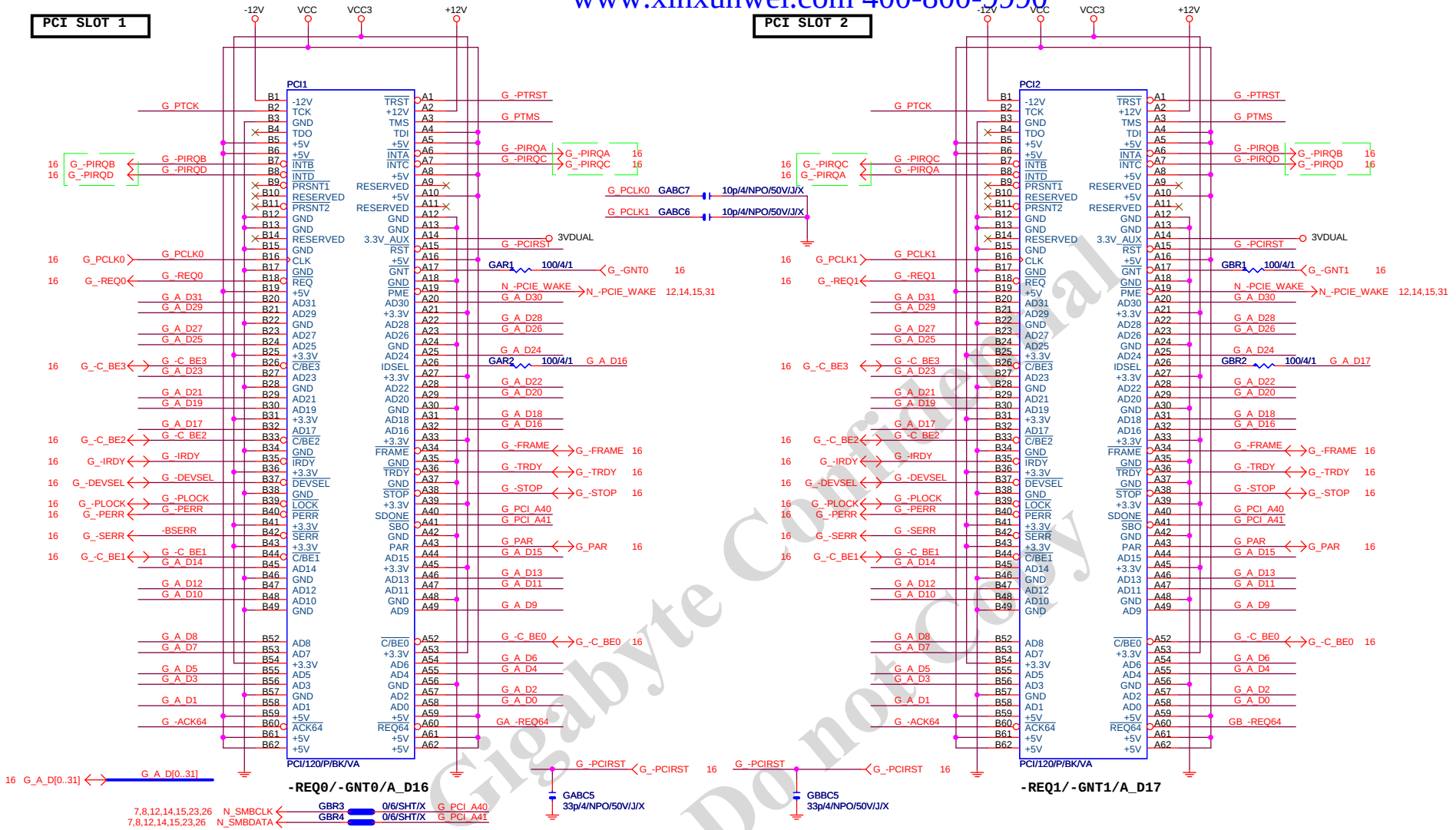
Title: PCIE_X1 1,2,3

Size: Custom | Document Number: GA-H97-HD3 | Rev: 1.01

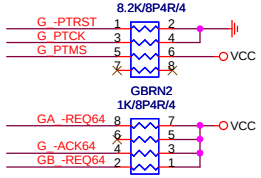
Date: Wednesday, June 18, 2014 | Sheet 15 of 34



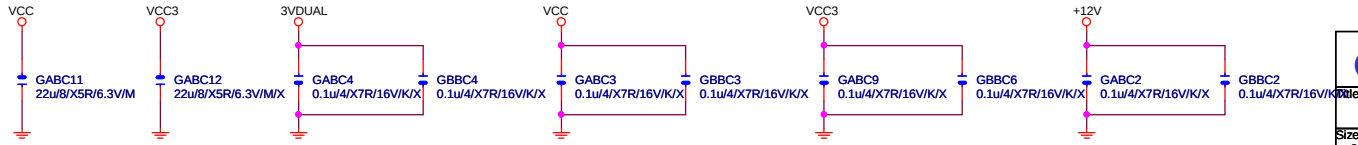
Gigabyte Technology		
Title: IT8892E		
Size: Custom	Document Number: GA-H97-HD3	Rev: 1.01
Date: Wednesday, June 18, 2014	Sheet 16 of 34	



PCI PU



PCI CAP



GIGABYTE™

Title: PCI SLOT 1&2		
Size: Custom	Document Number: GA-H97-HD3	Rev: 1.01
Date: Wednesday, June 18, 2014	Sheet 17 of 34	

SIO IT8728F

SYS_FAN3

CPU_OPT

CPU_FAN

SYS_FAN1

SYS_FAN2

IT8620E_BX

IT8620E/CX/S/[10HP2-118620-20R]

-PCIE_RST is OD in IT8728

EUP from PCH

PWR SHT

For 8728 EUP function

SIO PU

Hi :Disable WDT
Lo :Enable WDT to rest PWROK

SIO STRAP

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

JP5:N\A FOR 8728 DX
JP5:PULL DOWN FOR 8728 EX
anti-surge enable

EUP control detect

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爲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FAN6 FUNCTION 擇一使用,不然會互相干擾

DUAL BIOS OPT STRAP

Power leakage

SIO_18V

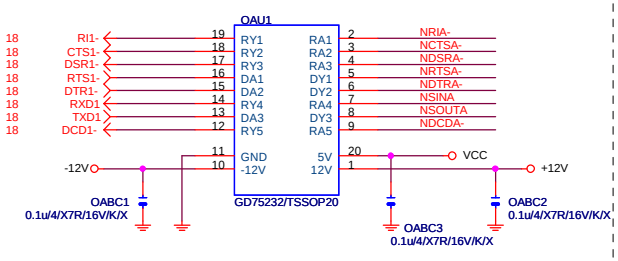
internal power pin, max 22nF cap

MB ID

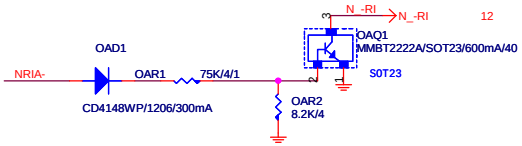
SIO CAP

Gigabyte Technology	
Title	ITE 8620 LPC IO
Size B	Document Number GA-H97-HD3 Rev 1.01
Date: Wednesday, June 18, 2014	Sheet 18 of 34

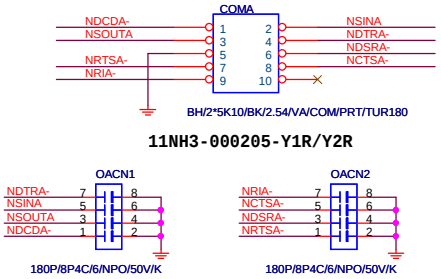
COMA



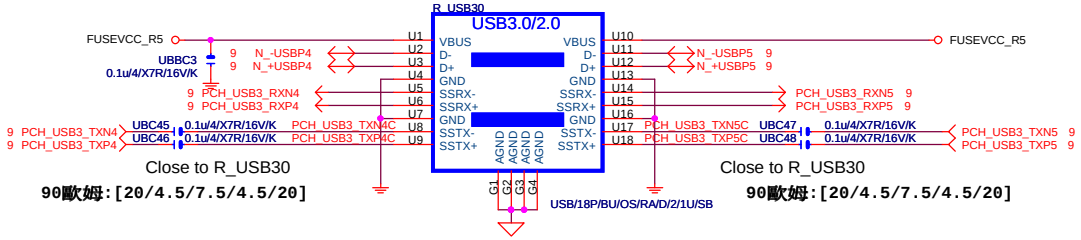
COM RI



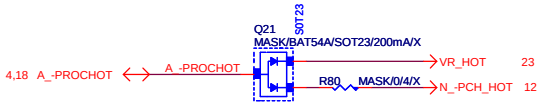
COM BUFFER



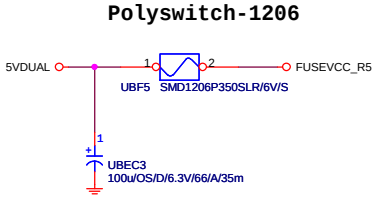
USB30_20 CONNECT



-PROHOT

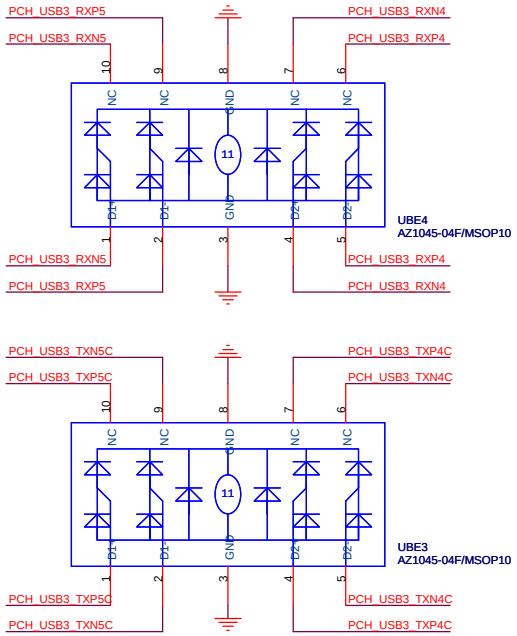


USB30 PWR



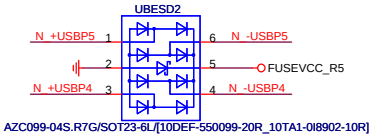
USB3.0 1Port - 1Fuse (3.5A)

USB30 ESD PROCTECT



Thunderbolt pin header

USB20 ESD PROCTECT



CLOSE R_USB30

AMC099加強版

Gigabyte Technology		
Title: COM/ PROHOT/ R_USB		
Size: Custom	Document Number: GA-H97-HD3	Rev: 1.01
Date: Wednesday, June 18, 2014	Sheet 19 of 34	

DUAL BIOS

指定用DII

VCC3_ME
NR226 330/4/1
NR227 1K/4/1
NR228 0/4/X
NR239 0/4/X
-SPI_HOLD_M
-SPI_CS_1
NQ20 S0T23
N_-ICH_SPI_CS
MMBT2222A/SOT23/600mA/40
NQ21 MMBT2222A/SOT23/600mA/40 S0T23
-SPI_HOLD_B NR229 8.2K/4

指定用DII

VCC3_ME
NR230 330/4/1
NR231 1K/4/1
-SPI_CS_2
NQ22 MMBT2222A/SOT23/600mA/40 S0T23
-SPI_HOLD_B NR234 1K/4/1/X
N_-ICH_SPI_CS
NQ23 MMBT2222A/SOT23/600mA/40 S0T23
-SPI_HOLD_M NR232 8.2K/4

M_BIOS
-SPI_CS_1 NR7 22/4
NC1 10p/4/NPO/50V/J/X
SPI_MISO
12 SPI_DQ2 NR220 0/4/SHT/X N_-SPI_WP0
CS# VDD SO HOLD# WP# SCK VSS SI
NR4 0/4/SHT/M/X
NBC2 1u/4/X5R/6.3V/K
NR221 0/4/SHT/X
NR222 8.2K/4/X -SPI_HOLD_M
-HOLD0
N_ICH_SPI_CLK
N_ICH_SPI_MOSI
NC2 10p/4/NPO/50V/J/X
MAIN BIOS
64M/Q/SPI/SO8/S

B_BIOS
-SPI_CS_2 NR8 22/4
SPI_MISO
12 SPI_DQ2 NR233 0/4/SHT/X N_-SPI_WP1
NR12 0/4/SHT/M/X
NBC3 1u/4/X5R/6.3V/K
NR224 0/4/SHT/X
NR225 8.2K/4/X -SPI_HOLD_B
-HOLD1
N_ICH_SPI_CLK 12
N_ICH_SPI_MOSI 12
BACKUP BIOS
64M/Q/SPI/SO8/S
NBC4 0.1u/4/X7R/16V/K

SPI_DQ3 12
12 N_ICH_SPI_MISO

MOSI For DMI RX Termination Voltage

12 N_ICH_SPI_MOSI	N_ICH_SPI_MOSI	NR10	8.2K/4/X
12 N_-ICH_SPI_CS	N_-ICH_SPI_CS	NR9	8.2K/4/X
12 N_-ICH_SPI_CS1	N_-ICH_SPI_CS1	NR246	8.2K/4/X
18 -SPI_HOLD_M	-SPI_HOLD_M	NR3	1K/4/1
18 -SPI_HOLD_B	-SPI_HOLD_B	NR11	1K/4/1

N_-SPI_WP1	NR2	8.2K/4/X	
N_-SPI_WP0	NR1	8.2K/4/X	
N_ICH_SPI_MISO	NR5	8.2K/4	
-HOLD0	NR235	1K/4/1/X	
-HOLD1	NR236	1K/4/1/X	

12 N_ICH_SPI_MISO NR6 22/4 SPI_MISO

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

1 means floating
0 means PD 1K

LPT PORT

PRN5 68/8P4R/4
18 AFD- STB- INIT-
LPT14 LPT1 LPT2 LPT16

PRN3 68/8P4R/4
18 SLIN-
LPT3 LPT17 LPT4 LPT5

PRN1 68/8P4R/4
LPT6 LPT7 LPT8 LPT9

18 ERR- ACK- BUSY PE SLCT PD[0..7]

D1 CD4148WP/1206/300mA
VCC
PBC2 0.1u/4/X7R/16V/K
PBC1 1u/6/X7R/16V/K/X

R&D技術通報151 有使用PRINT PORT的
MODEL，需使用新料號:10HP2-118728-72R 。(CHIP IT8728F/EX (GB) ITE/SMD
QFP128 PRINTPORT SORTING)料件。 串電阻33 ohm改爲68 ohm。

PRN2 2.2K/8P4R/4
PRN6 2.2K/8P4R/4
PRN4 2.2K/8P4R/4
PRN7 2.2K/8P4R/4
PR1 2.2K/4/1

LPT
LPT1 LPT2 LPT3 LPT4 LPT5 LPT6 LPT7 LPT8 LPT9 ACK- BUSY PE SLCT
LPT14 ERR- LPT16 LPT17
BH/2*13K24/BK/2.54/VA

M_BIOS
LCP/G-FL/1.27mm/200MIL/WHITE[10SL2-000008-31R]/X

Gigabyte Technology

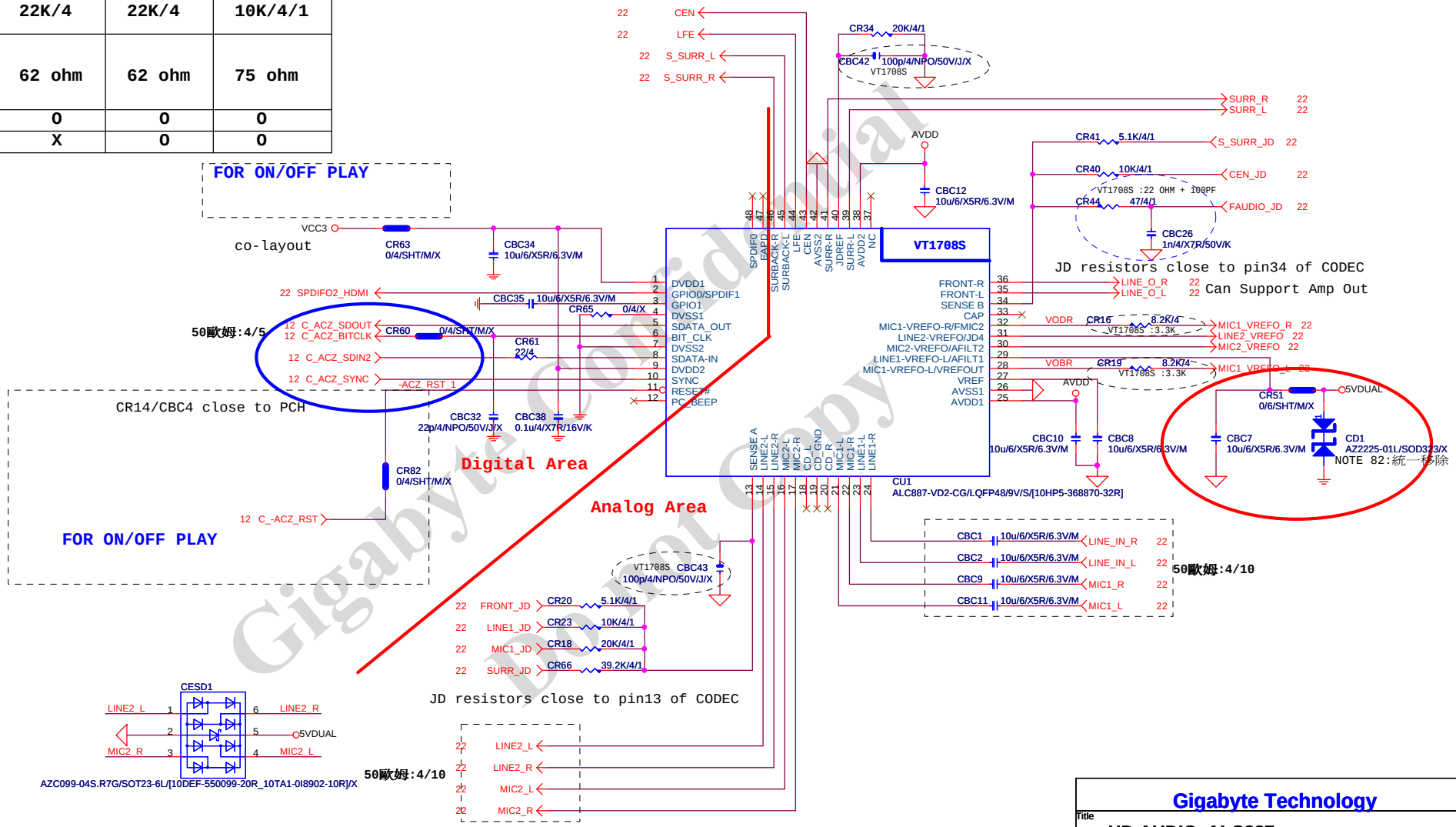
Title: BIOS

Size	Document Number	Rev
Custom	GA-H97-HD3	1.01

Date: Wednesday, June 18, 2014 Sheet 20 of 34

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
CR16/CR19 CR52/CR56/CR10/CR9	8.2K/4	8.2K/4	3.3K/4/1
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	X	0	0



Gigabyte Technology		
Title: HD AUDIO ALC887		
Size: Custom	Document Number: GA-H97-HD3	Rev: 1.01
Date: Wednesday, June 18, 2014	Sheet 21 of 34	

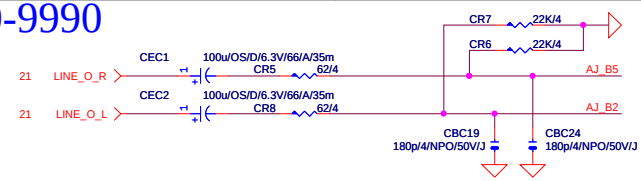
CR49 0/6/SHT/M/X → Close F_AUDIO

CR50 0/6/SHT/M/X → Close Codec

CR21 2.2/6 → Audio jack <--> USB_LAN

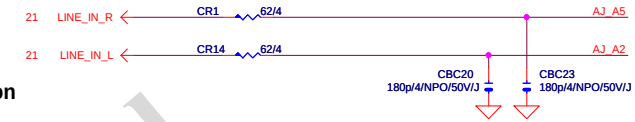
CR24 0/6/X → Under Audio jack

LINE-OUT



Only reserved for ALC888

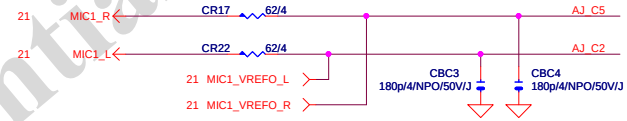
LINE-IN



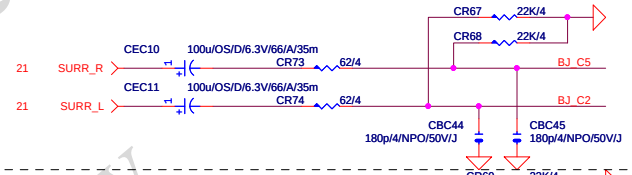
Verify MIC function in LINE-in

For 889A/888

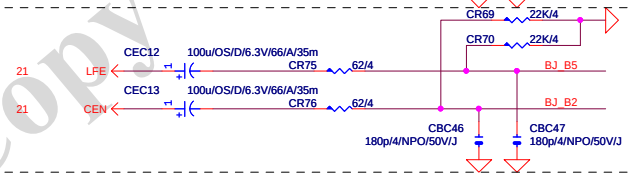
MIC-IN



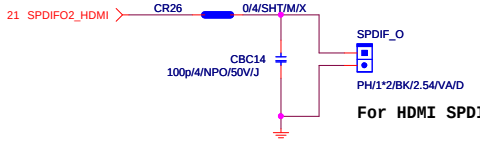
SURROUND



CEN/LFE



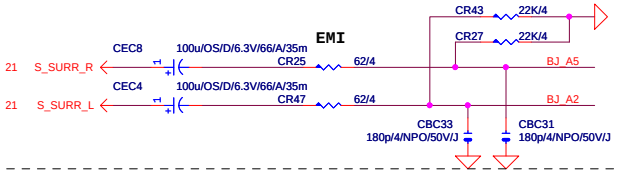
SPDIF_OUT



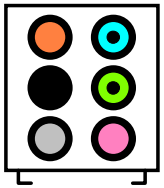
For HDMI SPDIF

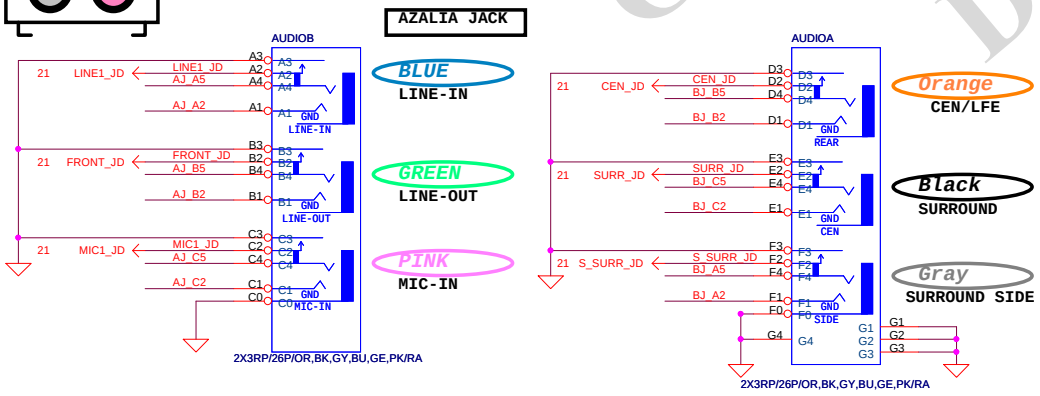
SPDIF_IN

SURR BACK

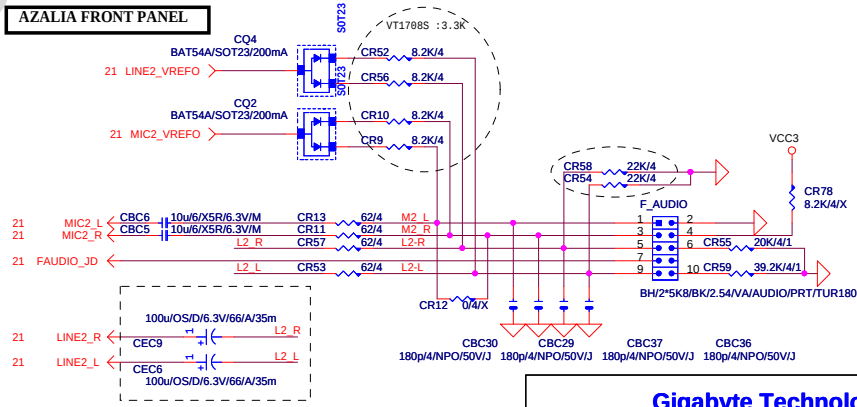


AZALIA JACK





AZALIA FRONT PANEL



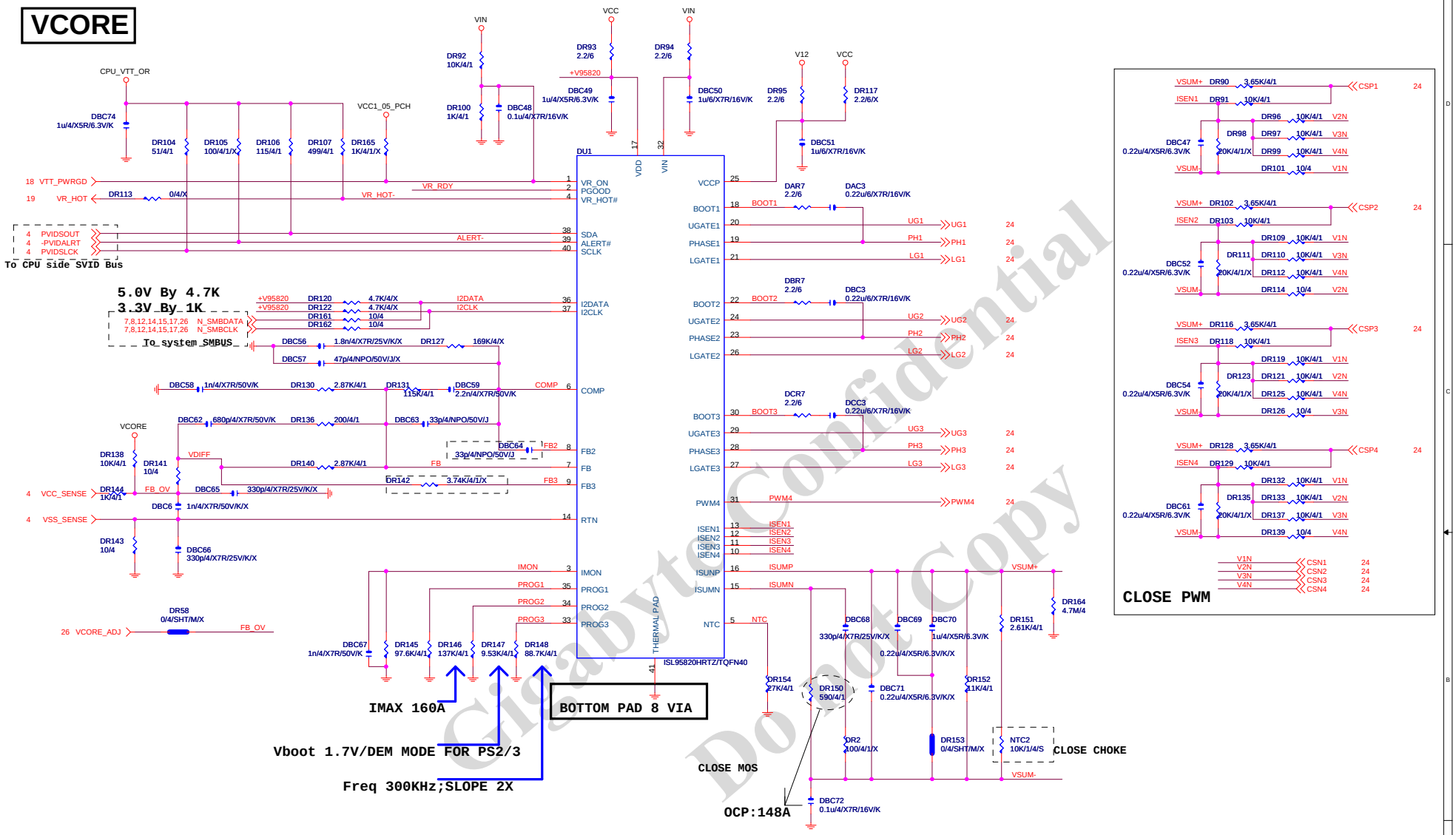
Gigabyte Technology

Title: AUDIO JACK

Size: Custom | Document Number: GA-H97-HD3 | Rev: 1.01

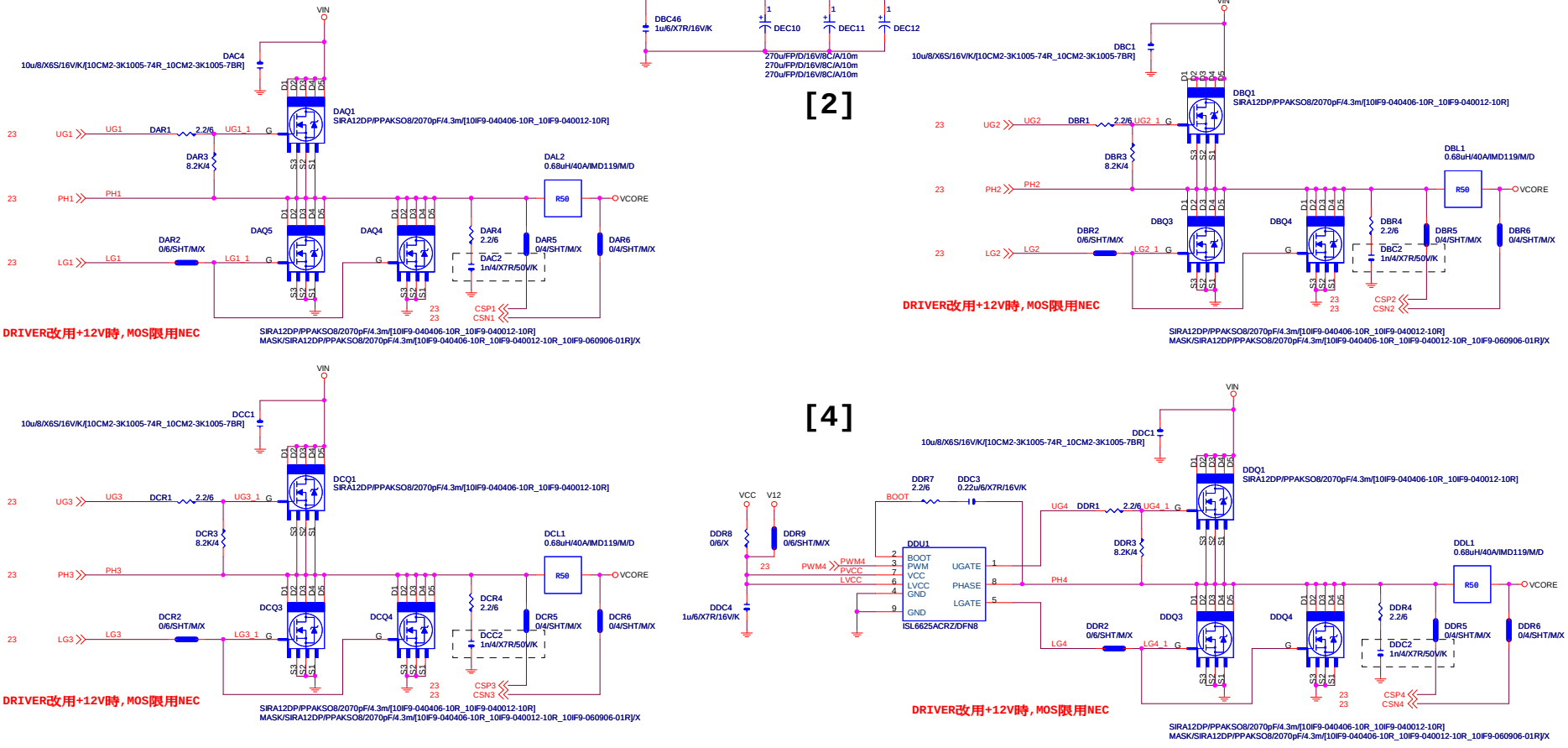
Date: Wednesday, June 18, 2014 | Sheet 22 of 34

VCORE

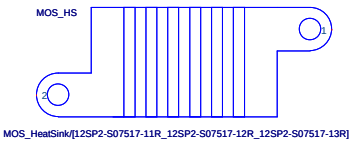


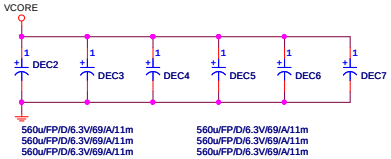
Gigabyte Technology	
Title	VCORE_ ISL95820
Size: Custom	Document Number: GA-H97-HD3
Rev	1.01
Date: Wednesday, June 18, 2014	Sheet 23 of 34

VCORE



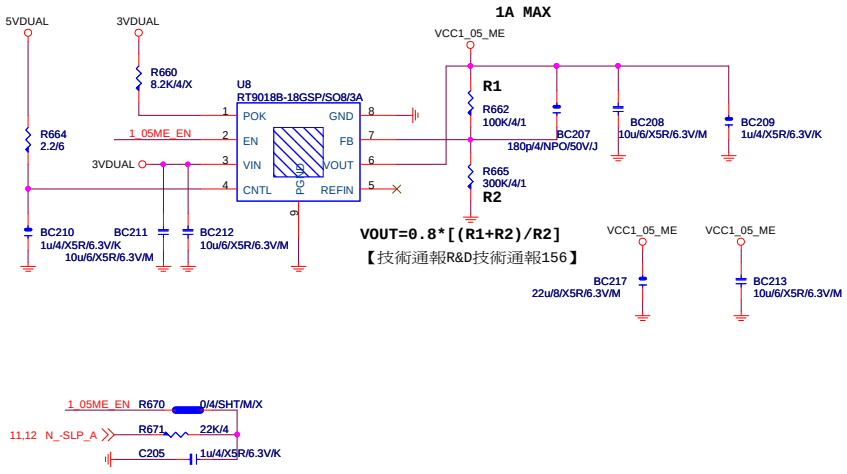
MOSFET HEATSINK



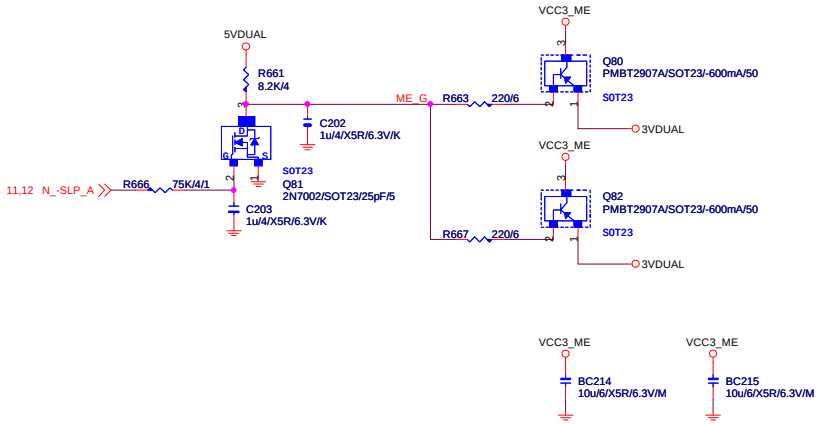


Gigabyte Technology		
Title: ISL95820_2		
Size: Custom	Document Number: GA-H97-HD3	Rev: 1.01
Date: Wednesday, June 18, 2014	Sheet 24 of 34	

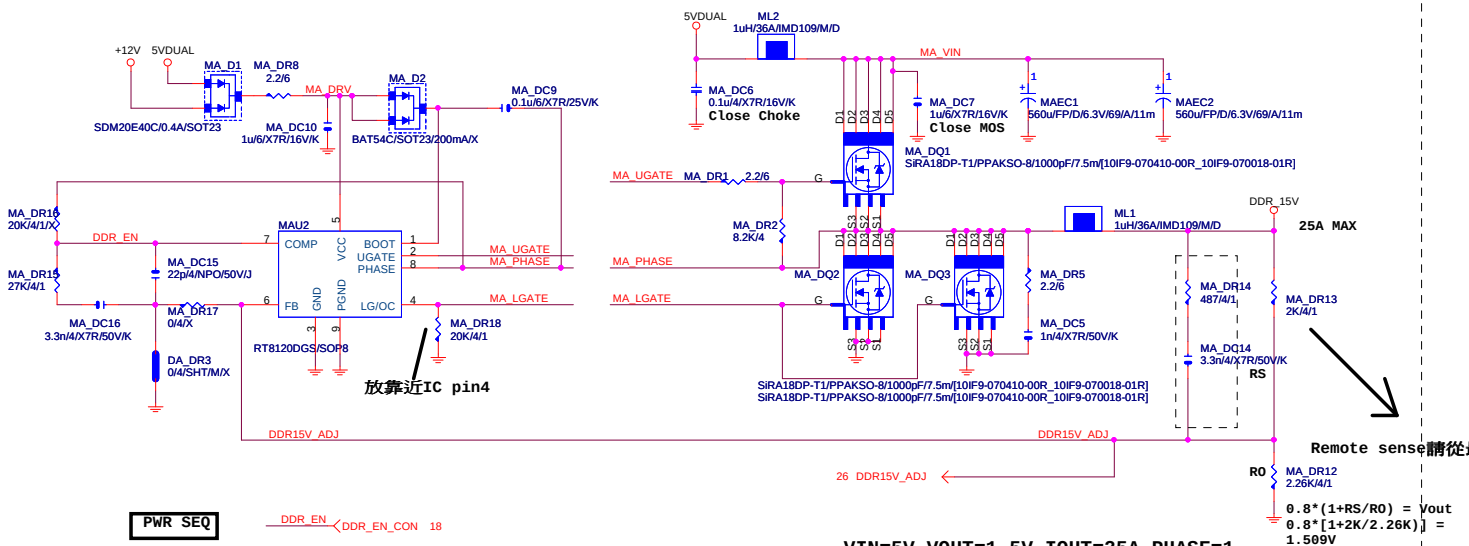
VCC1_05_ME



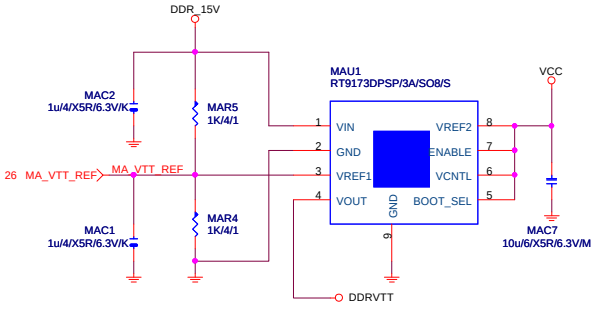
VCC3_ME



DDR_15V



DDRVTT



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℃)

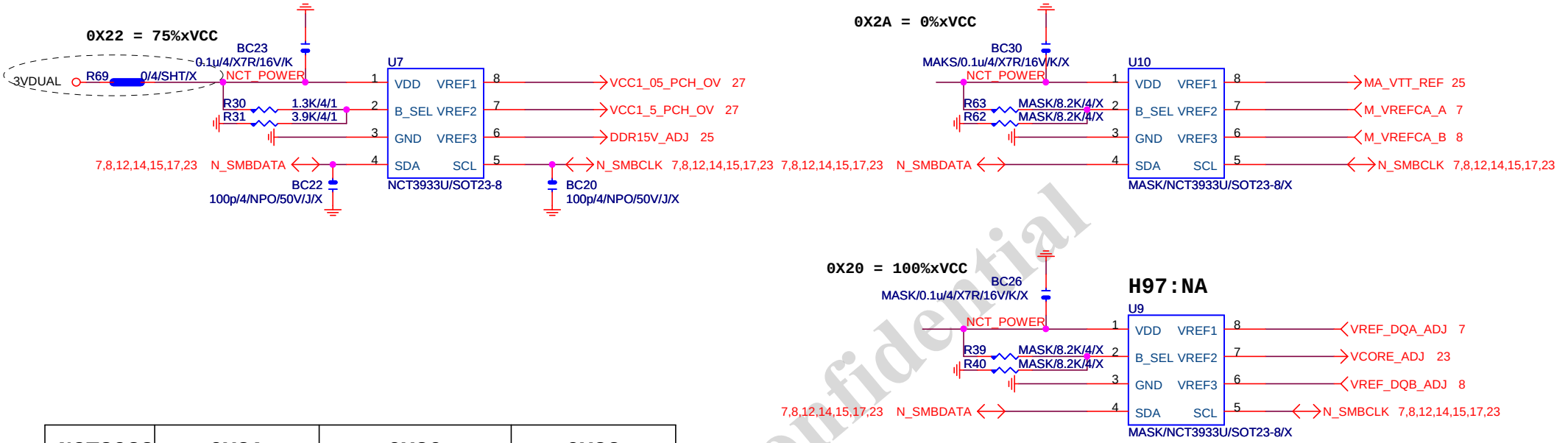
VIN Ripple current=4.7X1.7=7.99A(85℃)
-->故固態電容須2X7.99=15.98>11.45A

OCP:35.82A for Rds=6.7m for vishay@4.5V
OCP:72.727A for Rds=3.3m for renesas@10V
OCP:48A=Roset*Iocset / Rds(on)
=12K*10uA / [5//5]

GIGABYTE™

Title	DDR15V / M3 POWER	
Size: Custom	Document Number: GA-H97-HD3	Rev: 1.01
Date: Wednesday, June 18, 2014	Sheet 25 of 34	

OVER VOLTAGE



NCT3933	0X2A	0X20	0X22
VREF1	DDRVTT	VREF_DDRA_DQ	PCH Core
VREF2	VREF_DDRA_CA	N/A	VCC1_5_PCH
VREF3	VREF_DDRA_CA	VREF_DDRB_DQ	SMREF

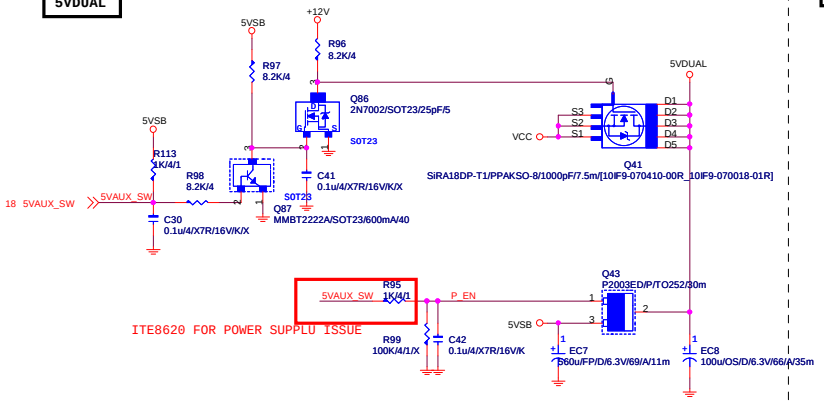
Gigabyte Technology

Title: CPU CORE VR-2

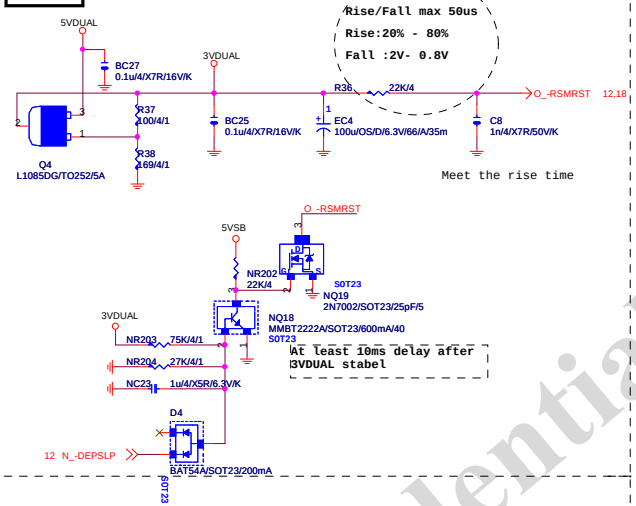
Size: Custom | Document Number: GA-H97-HD3 | Rev: 1.01

Date: Wednesday, June 18, 2014 | Sheet 26 of 34

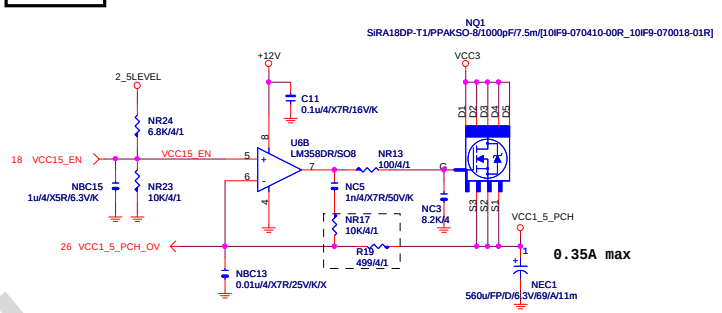
5VDUAL



3VDUAL

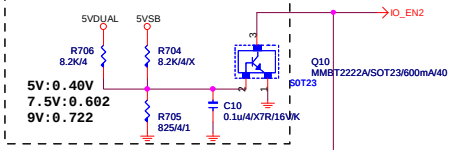


VCC1_5_PCH

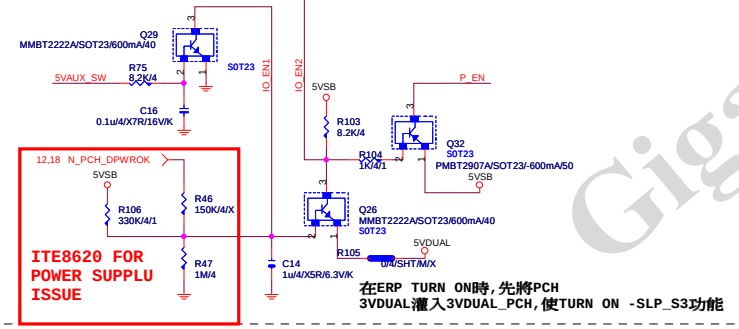


5VSB OVP:7.5V protection

NOTE 82:改5V DUAL,6v保護

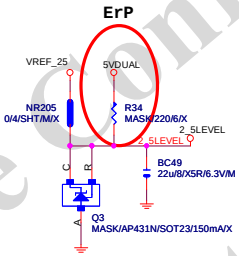


5VDUAL SHORT PROTECT

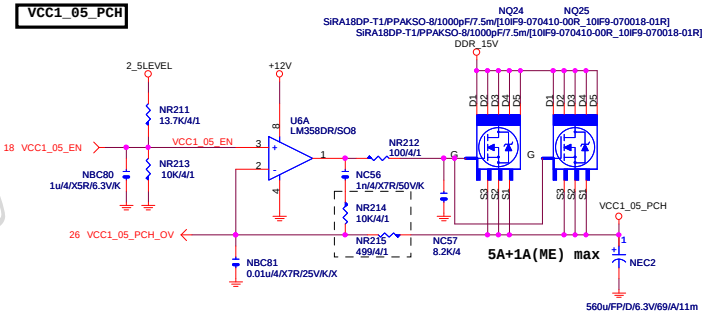


PCH ERP

2_5LEVEL



VCC1_05_PCH



PWR SEQ

Gigabyte Technology		
Title: DISCRETE POWER		
Size: Custom	Document Number: GA-H97-HD3	Rev: 1.01
Date: Wednesday, June 18, 2014	Sheet 27 of 34	

Front USB3.0

F_USB30 REV=1

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

F_USB30 PWR

UAFB1 SMD1206P350SLR/6V/S

UAEC3 100u/OS/D/6.3V/66/A/35m

F_USB30 ESD PROTECT

HCBE2 AZ1065-06Q/MSOP8L

Close to connector

HCBE1 AZ1065-06Q/MSOP8L

SATA LED

MMBT2222A/SOT23/600mA/40

SPKR

FPD1 CD4148WP/1206/300mA

To disable TCO timer

FPQ7 2N7002/SOT23/25pF/5

FRONT USB1

BH/2*5K9/BK/ON/2.54/VA/USB/PRT/TUR180

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

Close to connector

AMC099加強版

UAF1 SPR-P200T/6V/8/S

UAEC1 100u/OS/D/6.3V/66/A/35m

FRONT USB2

BH/2*5K9/BK/ON/2.54/VA/USB/PRT/TUR180

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

Close to connector

AMC099加強版

UAF3 SPR-P200T/6V/8/S

FRONT USB3

BH/2*5K9/BK/ON/2.54/VA/USB/PRT/TUR180

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

UAF5 SPR-P200T/6V/8/S

INTEL FRONT PANEL

F_PANEL

BH/2*10K10,12,13/BK/2.54/VA/PA

FPESD1

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

CASE OPEN

FPBC4 0.01u/4/X7R/25V/K

-USBOC_F

BAT54A/SOT23/200mA

F_USB POWER PROTECT

UAD5 BAT54A/SOT23/200mA

USB2.0 Signal & power short protection

USB2.0 Signal > 4.85V

Enable --> 3VDUAL=3.5V

(開機短路保護)

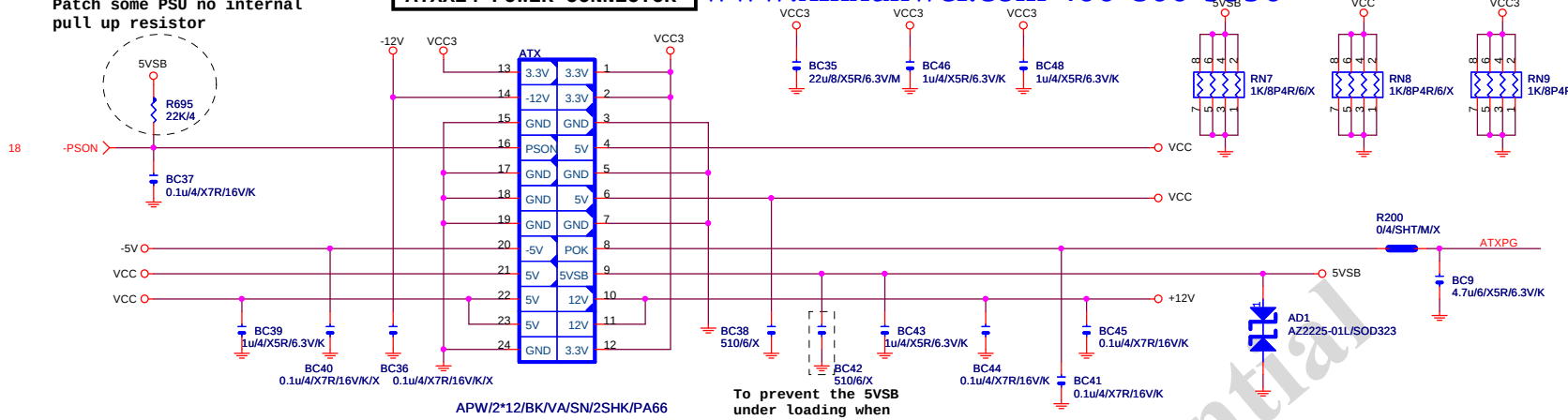
(關機短路保護)

ALL MASK

Gigabyte Technology	
Title	FP,F_USB,USB PWR,BZ
Size: Custom	Document Number: GA-H97-HD3 Rev: 1.01
Date: Wednesday, June 18, 2014	Sheet 28 of 34

ATXX24 POWER CONNECTOR

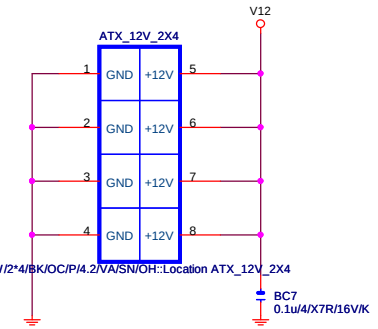
Patch some PSU no internal pull up resistor



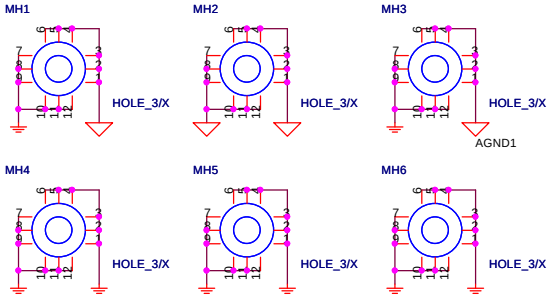
APW/2*12/BK/VA/SN/2SHK/PA66

To prevent the 5VSB under loading when boot

ATXX4 POWER CONNECTOR



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



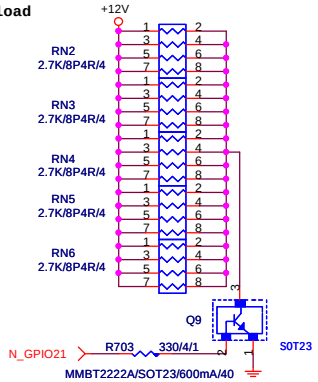
HOLE_4-RH-1

K1-ICT

4MMH

【技術通報R&D技術通報153】

To fix 12V light load abnromal issue



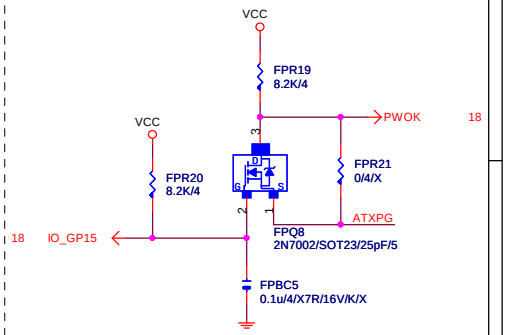
CLK GEN

CPU Frequency Selection

FSLB	FSLA	CPU
0	0	100M <Default>
0	1	133M
1	0	200M
1	1	166M

PWOK PATCH

【技術通報R&D技術通報154】



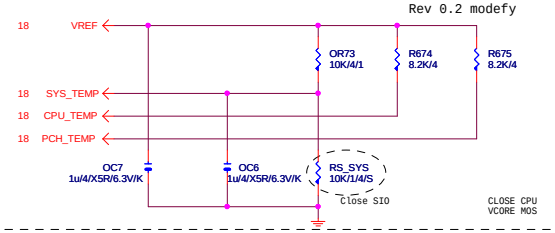
Gigabyte Technology

Title: ATX POWER CONNECTOR

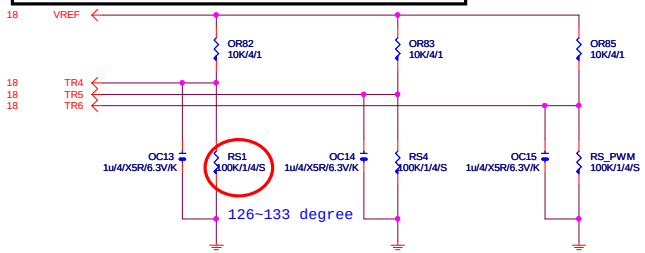
Size: Custom | Document Number: GA-H97-HD3 | Rev: 1.01

Date: Wednesday, June 18, 2014 | Sheet 29 of 34

TEMP H/W MONITOR

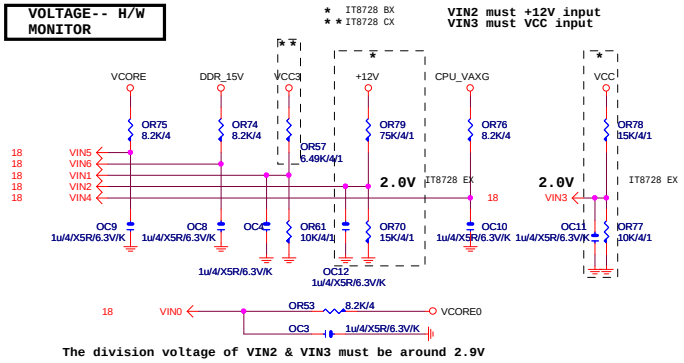


-PROCHOT:有mos heartsink不用prochot function



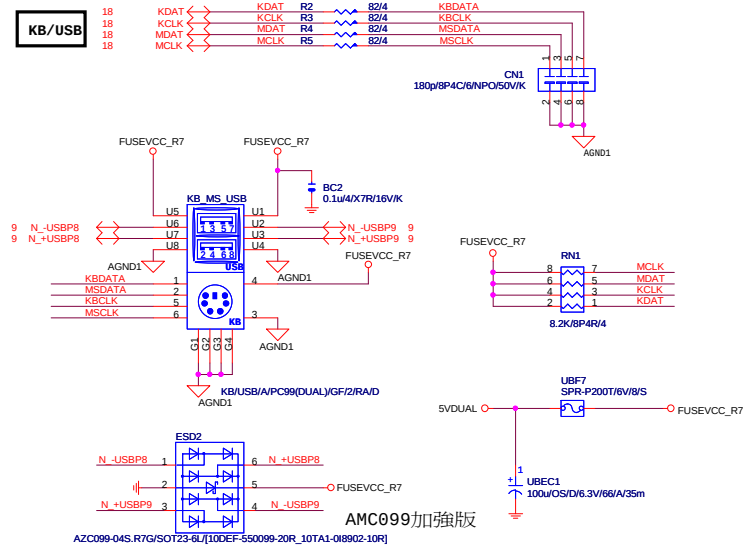
RS1、RS2、RS3 CLOSE CPU VR MOSFET

VOLTAGE-- H/W MONITOR

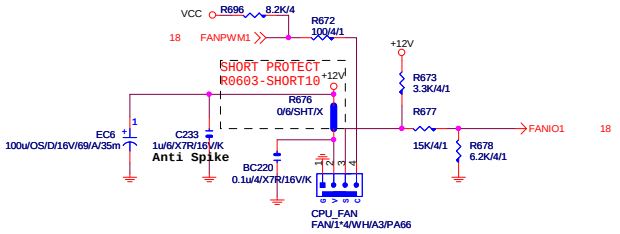


The division voltage of VIN2 & VIN3 must be around 2.9V

KB/USB



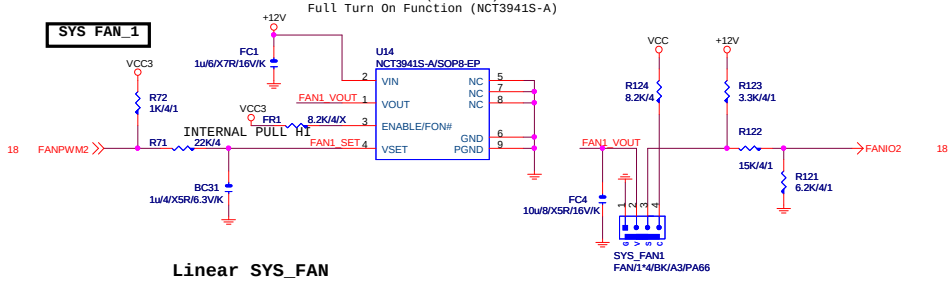
CPU_SMART_FAN



Linear SYS_FAN

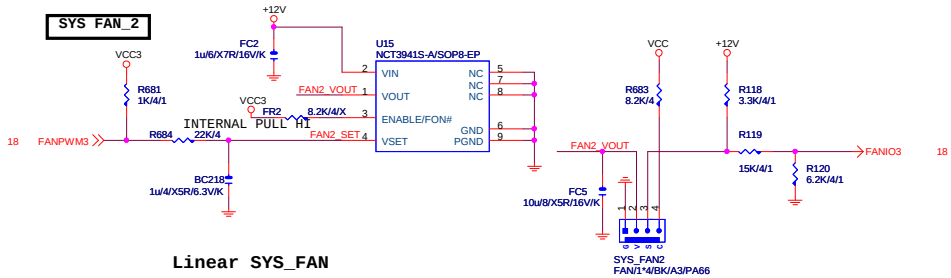
Enable Function (NCT3941S)
Full Turn On Function (NCT3941S-A)

SYS FAN_1



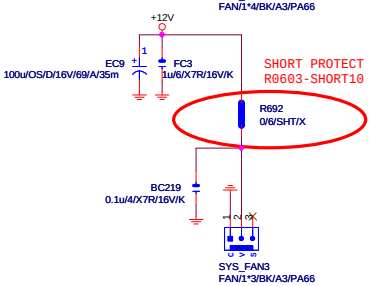
Linear SYS_FAN

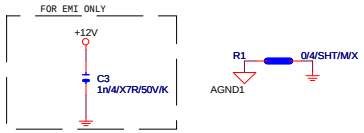
SYS FAN_2



Linear SYS_FAN

SYS FAN_3





Gigabyte Technology		
Title: HWM,KB/MS, FAN CTRL		
Size: Custom	Document Number: GA-H97-HD3	Rev: 1.01
Date: Wednesday, June 18, 2014	Sheet 30 of 34	

LAN:INTEL I217

FOR DSM MODE
(DEEP SLUMBER MODE)

ENABLE SW

Dual Color LED
D4 D3 Green
D4 D3 Orange

Single Color LED
D2 D1 Yellow

100歐姆:[20/4/8/4/20]

80歐姆:[15/5/5/5/15]

離IC近越好

SRCCLK 50歐姆:[18/4/10/4/18]

RTL8111F-VL-CG/QFN48

P35-152-19W9

(CLOSE LU1)

CLOSE LL2

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

(PIN21)

USB30_LAN CONNECTOR

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

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

100歐姆:[20/4/8/4/20]

USB30_LAN
USB3+LAN/1G/GO,Y/OS/RA/D/G30/[11NR6-702009-K1R_11NR6-702009-K4R]

90歐姆:[15/4.5/7.5/4.5/15]

UBF10 SMD1206P350SLR/6V/S

CLOSE USB30_LAN

AMC099加強版

CLOSE USB30_LAN

UBE1 AZ1045-04F/MSOP10

UBE2 AZ1045-04F/MSOP10

-USBOC_R

UBD1 BAT54A/SOT23/200mA

LAN

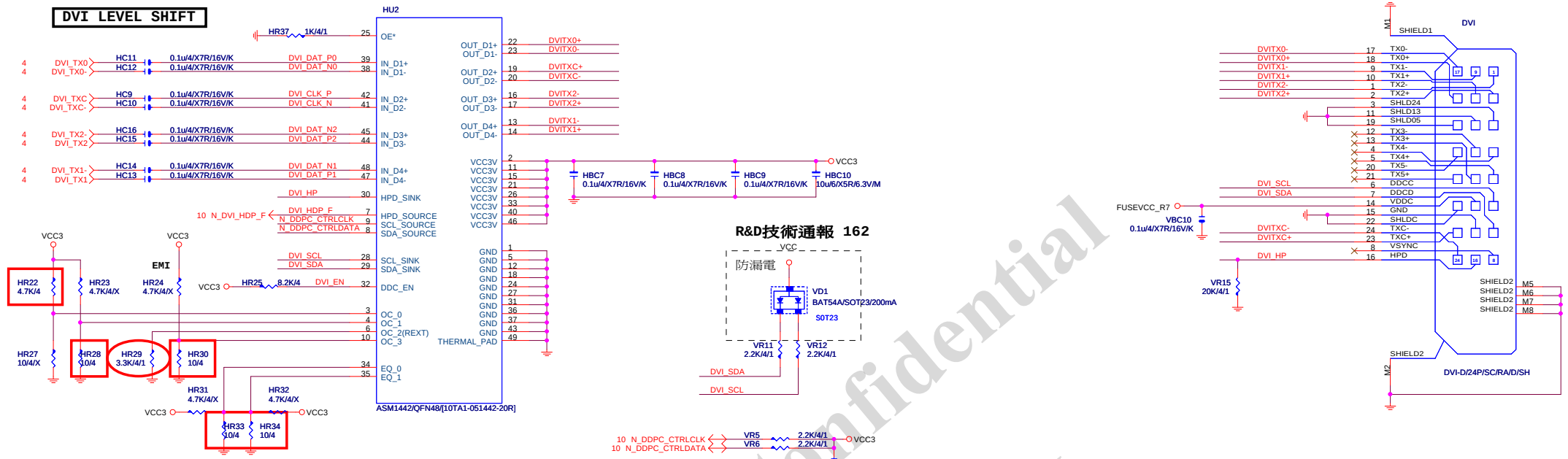
USB_LAN <--> R_USB30_1

Gigabyte Technology

Title	INTEL LAN I217	
Size: Custom	Document Number: GA-H97-HD3	Rev: 1.01
Date: Wednesday, June 18, 2014	Sheet 31 of 34	

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

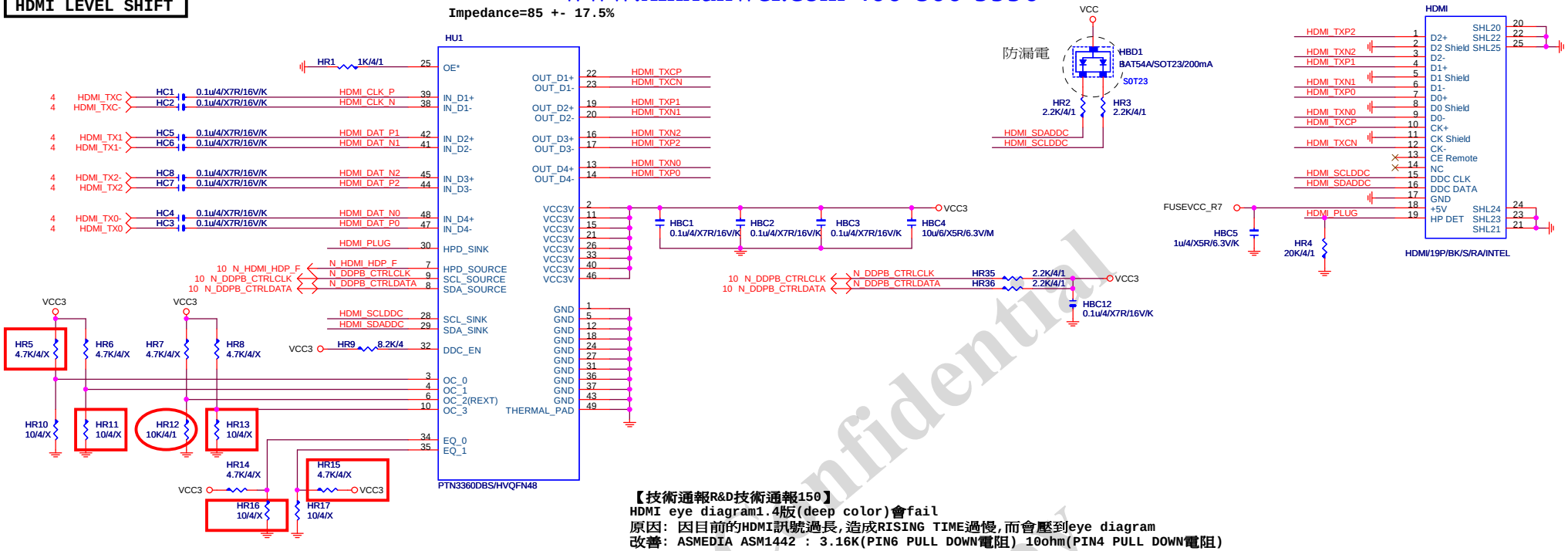
DVI LEVEL SHIFT



Gigabyte Technology			
Title: DVI			
Size: Custom	Document Number: GA-H97-HD3		Rev: 1.01
Date: Wednesday, June 18, 2014	Sheet 32 of 34		

HDMI LEVEL SHIFT

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



PTN3360:PIN 4/10/34/35 NC PIN,都不上值;只上HR12:10K
ASM1442:紅色框要上,HR12:3.16K

【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			
Title: HDMI			
Size: Custom	Document Number: GA-H97-HD3		Rev: 1.01
Date: Wednesday, June 18, 2014	Sheet 33 of 34		

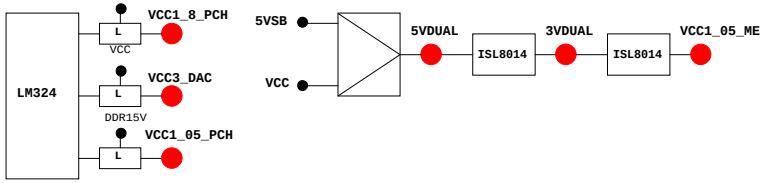
PCH GPIO LIST TABLE

PIN NAME	PWR	AFTER/PLTRST	Default	USAGE	NOTE
GP0	MAIN	H-Z	GPI	GPIO0	N/A
GP1/TACH1	MAIN		GPI	GPIO1	N/A
GP2/PIRQE#	MAIN		GPI	-PIRQE	P/U 8.2K VCC3
GP3/PIRQF#	MAIN		GPI	-PIRQF	P/U 8.2K VCC3
GP4/PIRQG#	MAIN		GPI	-PIRQG	P/U 8.2K VCC3
GP5/PIRQH#	MAIN		GPI	-PIRQH	P/U 8.2K VCC3
GP6/TACH2	MAIN		GPI	PCIEX1 Detect	P/U 8.2K VCC3
GP7/TACH3	MAIN		GPI	GPIO7	P/U 8.2K VCC3
GP8	STBY	H	GPI	GPIO8	N/A
GP9/OC5#	STBY		NATIVE	USB OC5#	N/A
GP10/OC6#	STBY		NATIVE	USB OC6#	N/A
GP11/SMBALERT#	STBY		NATIVE	USB PWR protect	P/U 8.2K 3VDUAL
GP12	STBY	L	GPI	GPIO12	N/A
GP13	STBY	L	GPI	LPCPME#	P/U 8.2K 3VDUAL
GP14/OC7#	STBY		NATIVE	USB OC7#	N/A
GP15	STBY	L	GPI	GPIO15(TLS Enable)	P/U 8.2K 3VDUAL
GP16	MAIN		GPI	GPIO16	P/U 8.2K VCC3
GP17/TACH0	MAIN		GPI	GPIO17	P/U 8.2K VCC3
GP18	MAIN		GPI	Mobile Only	N/A
GP19	MAIN		GPI	GPIO19	P/U 8.2K VCC3
GP20	MAIN		GPI	GPIO20	P/U 8.2K VCC3
GP21	MAIN		GPI	GPIO21	P/U 8.2K VCC3
GP22	MAIN	H-Z	GPI	GPIO22	P/U 8.2K VCC3
GP23	MAIN		GPI	GPIO23	N/A
GP24	STBY	L	GPI	SKTOCC#	N/A
GP25	STBY			Mobile Only	N/A
GP26	STBY			Mobile Only	N/A
GP27	STBY	H	GPO	GPIO27	P/U 8.2K 3VDUAL
GP28	STBY	H	GPO	PWR LED	P/U 8.2K 3VDUAL
GP29	STBY	L	GPI	GPIO29	N/A
GP30	STBY	H-Z	GPI	Mobile Only	N/A
GP31	STBY	H-Z	GPI	Mobile Only	N/A
GP32	MAIN	H	GPO	N/A	N/A
GP33	MAIN	H	GPO	N/A	N/A
GP34	MAIN	H-Z	GPI	-PCI_STOP	P/U 8.2K VCC3
GP35	MAIN	L	GPO	-ACZ_DET	P/U 8.2K VCC3
GP36	MAIN		GPI	N/A	N/A
GP37	MAIN		GPI	N/A	N/A
GP38	MAIN	H-Z	GPI	PCIEX4 Detect	P/U 8.2K VCC3
GP39	MAIN	H-Z	GPI	GPIO39	P/U 8.2K VCC3
GP40	STBY		NATIVE	USB OC1#	N/A
GP41	STBY		NATIVE	USB OC2#	N/A
GP42	STBY		NATIVE	USB OC3#	N/A
GP43	STBY		NATIVE	USB OC4#	N/A
GP44	STBY	L	NATIVE	GPIO44	P/U 8.2K 3VDUAL
GP45	STBY		NATIVE	GPIO45	P/U 8.2K 3VDUAL
GP46	STBY	L	NATIVE	GPIO46	P/U 8.2K 3VDUAL
GP47	STBY			Mobile Only	N/A
GP48	MAIN	H-Z	IN	GPIO48	P/U 8.2K 3VDUAL
GP49	MAIN	H-Z	IN	GPIO49	P/U 8.2K 3VDUAL
GP50	MAIN		NATIVE	-REQ1	P/U 2.2K VCC
GP51	MAIN	H	NATIVE	-GNT1	N/A
GP52	MAIN		NATIVE	-REQ2	P/U 2.2K VCC
GP53	MAIN	H	NATIVE	-GNT2	N/A
GP54	MAIN		NATIVE	-REQ3	P/U 2.2K VCC
GP55	MAIN	H	NATIVE	-GNT3	N/A
GP56	STBY		NATIVE	Mobile Only	N/A
GP57	STBY	H-Z	IN	VCORE_OV1	P/U 8.2K 3VDUAL
GP58	STBY	H-Z	NATIVE	F_USB_OC	P/U 8.2K 3VDUAL
GP59	STBY		NATIVE	USB_OC0#	N/A
GP60	STBY	H-Z	NATIVE	N/A(Reverse)	P/U 8.2K 3VDUAL
GP61	STBY	L	NATIVE	-SUSTAT	N/A
GP62	STBY	L	NATIVE	SUSCLK	N/A
GP63	STBY	L	NATIVE	GPIO63	N/A
GP64	MAIN	L	NATIVE	CLKOUTFLEX0	N/A
GP65	MAIN	L	NATIVE	CLKOUTFLEX1	N/A
GP66	MAIN	L	NATIVE	CLKOUTFLEX2	N/A
GP67	MAIN	L	NATIVE	CLKOUTFLEX3	N/A
GP72	STBY	H-Z	NATIVE	VCORE_OV4	P/U 8.2K 3VDUAL
GP73	STBY			Mobile Only	N/A
GP74	STBY	H-Z	NATIVE	1_05V_OV2	P/U 8.2K 3VDUAL
GP75	STBY	H-Z	NATIVE	N/A(Reverse)	P/U 8.2K 3VDUAL

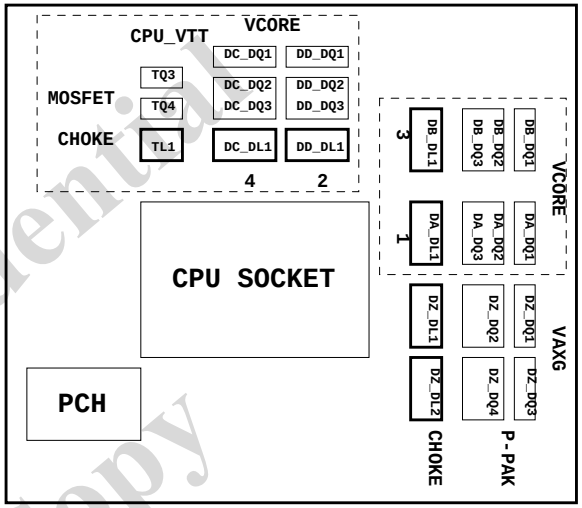
Super I/O ITE8720 GPIO Table

PIN NAME	USAGE	NOTE
SVC/PECI_RQT/GP14	-PECI_REQ	
PWROK1/GP13	PWROK1/ITE_PWROK	
KRST#/GP62	-KBRST	
SO/GP50	-ICH_SPI_CS	
IRTX/GP47/CE2_N/JP7	CEB_N	
GP46/IRRX	-LAN2_DSM	
PSION#/GP42	-PSON	
PWROK2#/GP41	PECI_CTL	
PCIRST3#/GP10/VDIMM_STR_EN	-PCIE_RST	
RSMRST#CIRRX1/GP55	-RSMRST	
PME#/GP54	-LPCPME	
PD5/GP75/BUSSO0	N/A	

PIN NAME	USAGE	NOTE
FAN_TAC2/GP52	FANIO2	
FAN_TAC3/GP37	FANIO3	
VIDO3/FAN_TAC4/GP25/DSR2#	FANIO4	
FAN_CTL2/GP51	FANPWM2	
FAN_CTL3/GP36	FANPWM3	
VID4/GP34	BEEP-	
VID3/GP33	TURBO1	
VID2/GP32	TURBO0	
VCORE_GOOD/VID6/GP63	CPUT_LED1_C	
VID5/GP35	CPUT_LED2_C	
VID1/GP31	CPUT_LED3_C	
VID0/GP30	-LAN1_DSM	NBT_LED1_C
SLCT/GP80	CPU_LED1_C	
PE/GP81	CPU_LED2_C	
BUSY/GP82	CPU_LED3_C	
PD3/GP73/BUSSI1	SB_LED1_C	
PD4/GP74/BUSSI2	SB_LED2_C	
VCORE_EN/VID7/GP64	IT_GP64	SB_LED3_C
PD0/GP70	NB_LED1_C	
PD1/GP71	NB_LED2_C	
PD2/GP72/BUSSI0	NB_LED3_C	
GP22/SCK	LOW_PWR_1	
VIDO5/GP27/SIN2	LOW_PWR_2	
PCIRST2#/GP11	-PFMRST1	
PCIRST1#/GP12	-PFMRST2	
3VSBSW#/GP40	CSI_F0	BSEL166_1
SUSC#/GP53	CSI_F1	BSEL166_2
GP23/SI	BSEL166_3/CSISBSL	
VIDO0/GP20/CTS2#	CPUT_LED1_C	BSEL166_4
GP65/VDDA_EN/GB_01	MB_ID2	
PD6/GP76/BUSSO1	MB_ID3	
PD7/GP77/BUSSO2	MB_ID4	
AFD#/GP86/SMBC_R	空 PIN	FST_2X8
INIT#/GP85/SMBD_M	SEC_2x8	GTLREF_AD2
ACK#/GP83	DDR_LED1_C	
VIDO1/GP21/DCD2#	DDR_LED2_C	
STB#/GP87/SMBC_M	DDR_LED3_C	
PWRON#GP44	VCORE_OV1	
PANSWH#/GP43	PWRBTSW	
KDAT/GP61	-PWRBTSW	
KCLK/GP60	KDAT	
MDAT/GP57	KCLK	
MACL/GP56	MDAT	
GP66/VLDT_EN/GB_02	NBT_LED1_C	MCLK
SVD/PCIRSTIN#/CIRTX/GP15	PWM2_CR	
KDAT/GP61	PWM2_CR	
GP67/CPU_PG/GB_03	EN_LOADLINE	IT_GP67/-EN_PWM2
SLIN#/GP84/SMBD_R	-EN_PWM2	
PSI_L/FAN_CLT5/CIRRX2/GP16	-THERM	
VIDO4/GP26/SOUT2	DDR18V_PH2_EN	
VIDO2/FAN_TAC5/GP24/DSR2#	DDR18V_LED	
VIDO6/GP17/RI2#	1_1V_PH_EN	
VIDO7/JP6/DTR2#	JP6	
PD5/GP75/BUSSO0	SB_LED3_C	



PWM各相位的擺法如下：



BIOS超電壓對應表：

線路圖名稱	BIOS選項
Vcore	CPU Vcore
CPU_VTT	CPU Termination
CPU_VAXG	CPU Graphic Core
VCC1_8_PCH	CPU PLL
VCC1_05_PCH	PCH core
3VDUAL	3VDUAL
DDR15V	DRAM voltage
DDRVTT	DRAM Terminatio
VREF_CA_A/VREF_CA_B	DRAM Address Ref
VREF_DQ_A/VREF_DQ_B	DRAM Data Ref

散熱模組料號：

Z77-D3H :
PCH :
12SP2-S05511-01R/02R/03R
MOSFET :
12SP2-S08924-01R/02R/03R

	3 pin FAN control	4 pin FAN control	FAN speed	Controller
CPU FAN	FANPWM1	FANPWM3	FANIO1	IT8720
	ICH_FAN_PWM2	ICH_FAN_PWM0	ICH_FAN_TACH0	PCH
SYS FAN	FANPWM2	N/A	FANIO2	IT8720
	ICH_FAN_PWM1	N/A	ICH_FAN_TACH1	PCH
PWR FAN	N/A	N/A	FANIO3	IT8720
			ICH_FAN_TACH2	PCH

Gigabyte Technology
Title: TABLE LIST
Size: C | Document Number: GA-H97-HD3 | Rev: 1.01
Date: Wednesday, June 18, 2014 | Sheet 34 of 34