Model Name: GA-H81M-S1

Revision 1.0

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

SHEET	TITLE
28	RT8120_DDR POWER
29	
30	
31	
32	

Gigabyte Technology

Title: Cover Sheet		
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Model Name: GA-H81M-S1

Revision 1.0

Component value change history

2013/05/02

Data	Change Item	Reason
2013/01/30	Modify to R0.2	
	PCIEX1_2 CLK Change Port	
	ADD Disable SVID [SVID_CTRL]	
	ADD Disable ME [DS_ME]	
	ADD -PCIE_RST Patch	
2013/02/05	O_PWROK1 reserve 0.01u Cap (For EMI)	
2013/03/11	Update to R1.0	
	Modify F_PANEL MPD+ (Super I/O GP65)	
	ADD SYS_FAN 防燒	
	ADD N_-THRMTRIP / A_-PROCHOT Protection Option	
	ADD 5VSB OVP Protection	
	ADD +12V Dummy Control	
	Reserve N_PCH_DPWROK Control	
2013/03/19	ADD EMI 0ohm (R707)	
2013/04/02		PBOM: 9MB85MHD3-00-10A
2013/04/08	Update PROCHOT	PBOM: 9MB85MHD3-00-10B
	R148: 35.7K -> 75K	
	R136: 1.4K -> 1.5K	
	DR149: 3.83K -> 13K	
2013/05/02	Change H81M-S1	Del COM,LPT
		Change Single BIOS,CPU之外用電解電容
2013/06/25	Add R394 330K/4	
	Change R384 1M/4 , Del R383	

Circuit or PCB layout change

DATE	Change Item	Reason

Gigabyte Technology

Title	BOM & PCB MODIFY HISTORY
Size: Custom	Document Number: GA-H81M-S1
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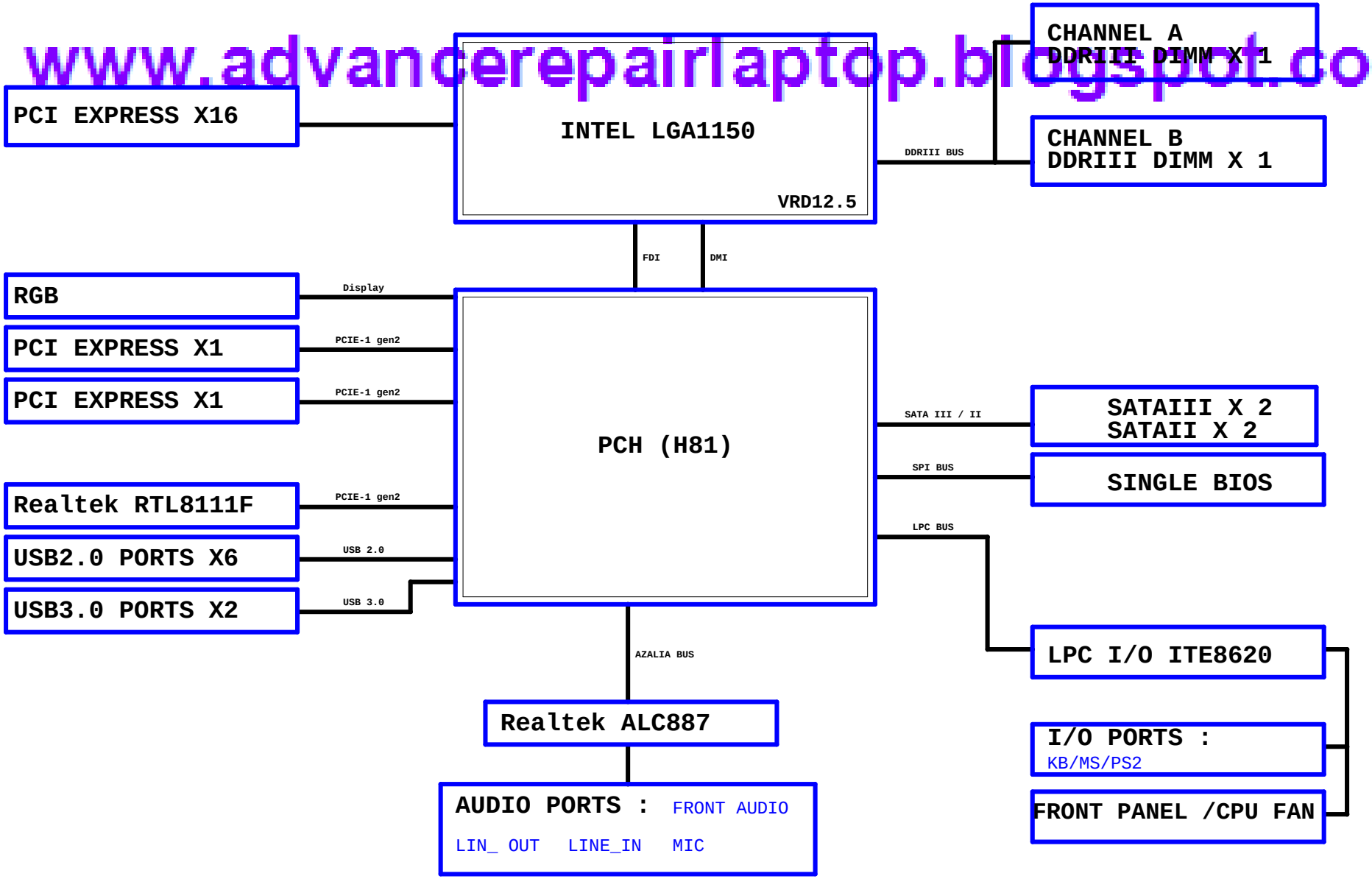
BLOCK DIAGRAM



Gigabyte Technology		
Title: BLOCK DIAGRAM		
Size: C	Document Number: GA-H81M-S1	Rev: 1.0
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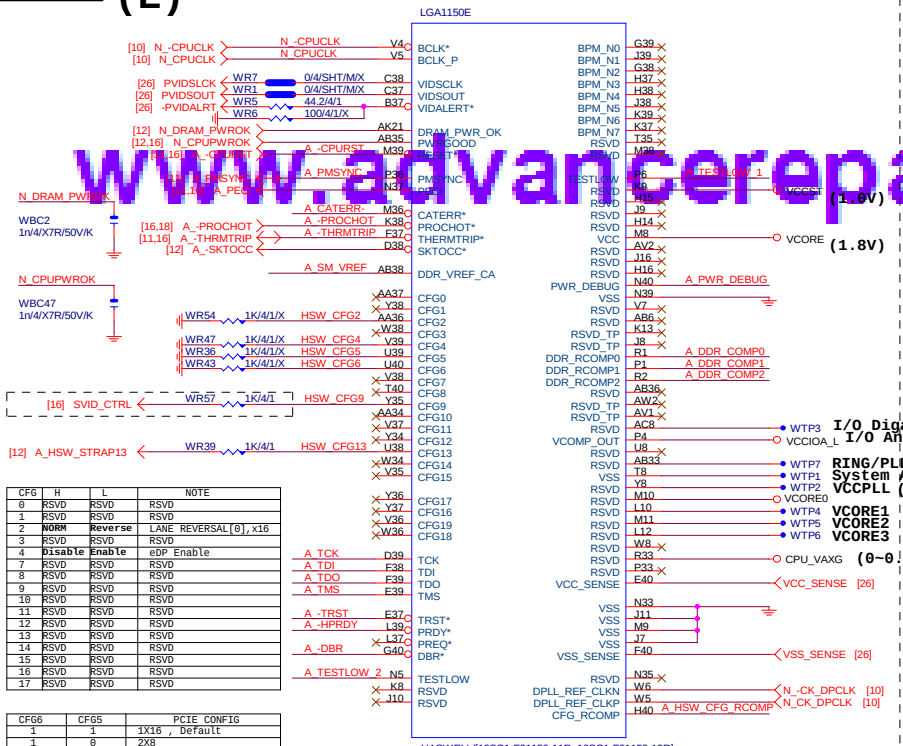
LGA1150 (E)

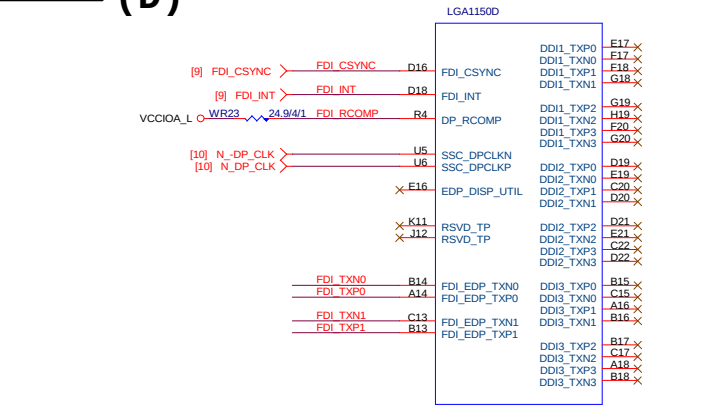


CFG	H	L	NOTE
0	RSVD	RSVD	RSVD
1	RSVD	RSVD	RSVD
2	**NORM**	**Reverse**	LANE REVERSAL[0],x16
3	RSVD	RSVD	RSVD
4	**Disable**	**Enable**	eDP Enable
7	RSVD	RSVD	RSVD
8	RSVD	RSVD	RSVD
9	RSVD	RSVD	RSVD
10	RSVD	RSVD	RSVD
11	RSVD	RSVD	RSVD
12	RSVD	RSVD	RSVD
13	RSVD	RSVD	RSVD
14	RSVD	RSVD	RSVD
15	RSVD	RSVD	RSVD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

CFG6	CFG5	PCIE CONFIG
1	1	1X16 , Default
1	0	2X8
0	1	RSVD
0	0	X8,X4,X4

CFG 0-17 all internal PULL-UP

LGA1150 (D)



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

FDI_TXP[0..1] → FDI_TXP[0..1] [9]
FDI_TXN[0..1] → FDI_TXN[0..1] [9]

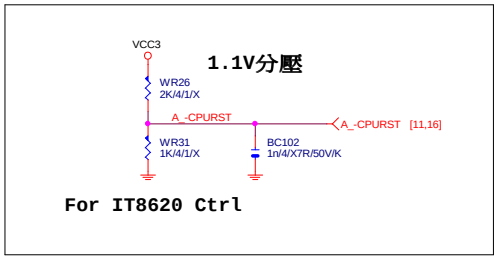
LGA1155 (C)

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

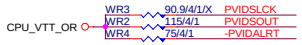
DMI:12/4/4/4/12(breakout min 8/4/4/4/8)
Impedance=85 +- 17.5%

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

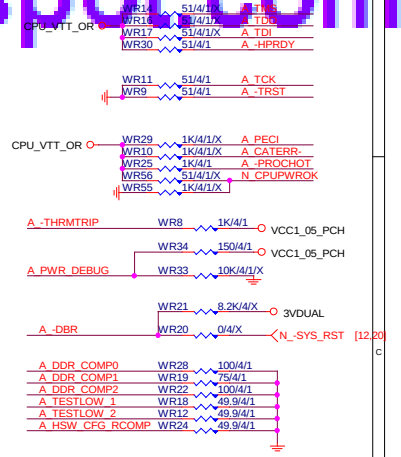
-CPURST



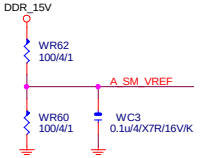
CPU SVID



CPU PU/PD



SM REF



Title	CPU LGA1150-A		
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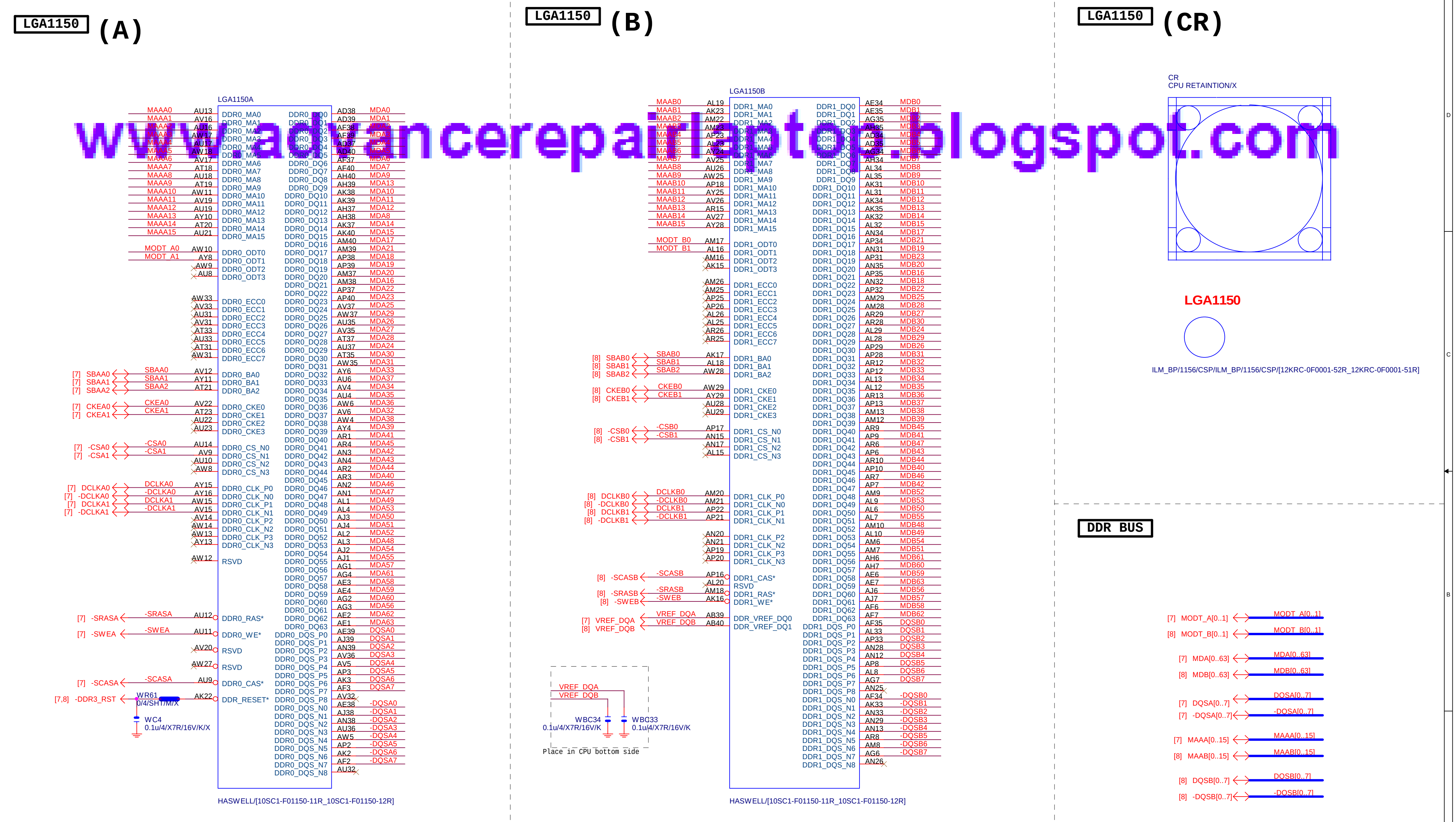
Gigabyte Technology



Gigabyte Technology

Title: CPU LGA1150-B

Size	Document Number	Rev
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LGA1150 (F,J)

(1.0V)
CPU_VTT_OR
VCORE
WBC1
22u/8/X5R/6.3V/M
LGA1150F
VCCIO_OUT
VCCIO2PCH
VCCST
WBC23
0.1u/4/X7R/16V/K
WBC13
0.1u/4/X7R/16V/K
WR63
0/4/SHT/M/X
VCCIO2PCH
(1.07V)
WR64
0/4/SHT/M/X
VCC1_05_PCH
VCORE
VCORE
DDR_15V
LGA1150J
WR67
6.04K/4/1
[11,12,16] O_PWROK1
VCCST_PWRGD
WR66
3.16K/4/1
HASWELL/[10SC1-F01150-11R_10SC1-F01150-12R]
HASWELL/[10SC1-F01150-11R_10SC1-F01150-12R]

LGA1155 (G,H,I)

LGA1150G
LGA1150I
LGA1150H
HASWELL/[10SC1-F01150-11R_10SC1-F01150-12R]
HASWELL/[10SC1-F01150-11R_10SC1-F01150-12R]
HASWELL/[10SC1-F01150-11R_10SC1-F01150-12R]

VCore CAP

(X18)

VCORE
WBC35 22u/8/X5R/6.3V/M
WBC42 22u/8/X5R/6.3V/M
WBC36 22u/8/X5R/6.3V/M
WBC43 22u/8/X5R/6.3V/M
WBC44 22u/8/X5R/6.3V/M
VCORE
WBC38 22u/8/X5R/6.3V/M
WBC37 22u/8/X5R/6.3V/M
WBC46 22u/8/X5R/6.3V/M
WBC39 22u/8/X5R/6.3V/M
WBC41 22u/8/X5R/6.3V/M
WBC40 22u/8/X5R/6.3V/M
VCORE
WBC19 22u/8/X5R/6.3V/M
WBC21 22u/8/X5R/6.3V/M
WBC6 22u/8/X5R/6.3V/M
WBC9 22u/8/X5R/6.3V/M
WBC20 22u/8/X5R/6.3V/M
WBC7 22u/8/X5R/6.3V/M
WBC11 22u/8/X5R/6.3V/M

DDR CAP

(X9)

DDR_15V
WBC29 22u/8/X5R/6.3V/M
WBC30 22u/8/X5R/6.3V/M
WBC31 22u/8/X5R/6.3V/M
WBC32 22u/8/X5R/6.3V/M
DDR_15V
WBC24 22u/8/X5R/6.3V/M
WBC25 22u/8/X5R/6.3V/M
WBC26 22u/8/X5R/6.3V/M
WBC27 22u/8/X5R/6.3V/M
WBC28 22u/8/X5R/6.3V/M

Gigabyte Technology		
Title: CPU LGA1150-C		
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DDR3 (A)

DDR3_1

DDRVTT

DDR_15V

N_SMBDATA
N_SMBCLK

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

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

MR17 0/4

VCC3

VDDSPD_A

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

MC5 VREF_DDRA

MC1 VREF_DODDRA

0.1u/4/X7R/16V/K

[8,12,14,15,20] N_SMBCLK
[8,12,14,15,20] N_SMBDATA

[5] SBAA2
[5] SBAA1
[5] SBAA0

[5] CKEA1
[5] CKEA0

[5] -CSA1
[5] -CSA0

[5] -DCLKA1
[5] DCLKA1

[5] -DCLKA0
[5] DCLKA0

[5] MAAA[0..15]

[5,8] -DDR3_RST
[5] -SCASA
[5] -SRASA
[5] -SWEA

-DDR3_RST

MC6 100p/4/NPO/50V/J

DDR3/240/BK/VA/D

BLACK CONNECTOR

MDQT_A[0..1] [5]
-DQSA[0..7] [5]
DQSA[0..7] [5]

MDA[0..63] [5]

DDR3 VREF

DDR_15V

MR15 1K/4/1
MR14 1K/4/1
VREF_DDRA

MR4 1K/4/1
MR5 1K/4/1
MR1 10/4
VREF_DODDRA
VREF_DQA [5]

DDR15V Decouple

DDR_15V

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

DDR_15V

MBC1 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
MBC12 0.1u/4/X7R/16V/K
MBC14 0.1u/4/X7R/16V/K

DDR_15V

MBC15 1u/4/X5R/6.3V/K
MBC17 1u/4/X5R/6.3V/K
MBC27 1u/4/X5R/6.3V/K
MBC29 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
MBC9 1u/4/X5R/6.3V/K

DDRVTT Decouple

DDRVTT

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

DDRVTT

MBC18 1u/4/X5R/6.3V/K
MBC10 0.1u/4/Y5V/16V/Z

Gigabyte Technology

Title: DDRIII CHANNEL A

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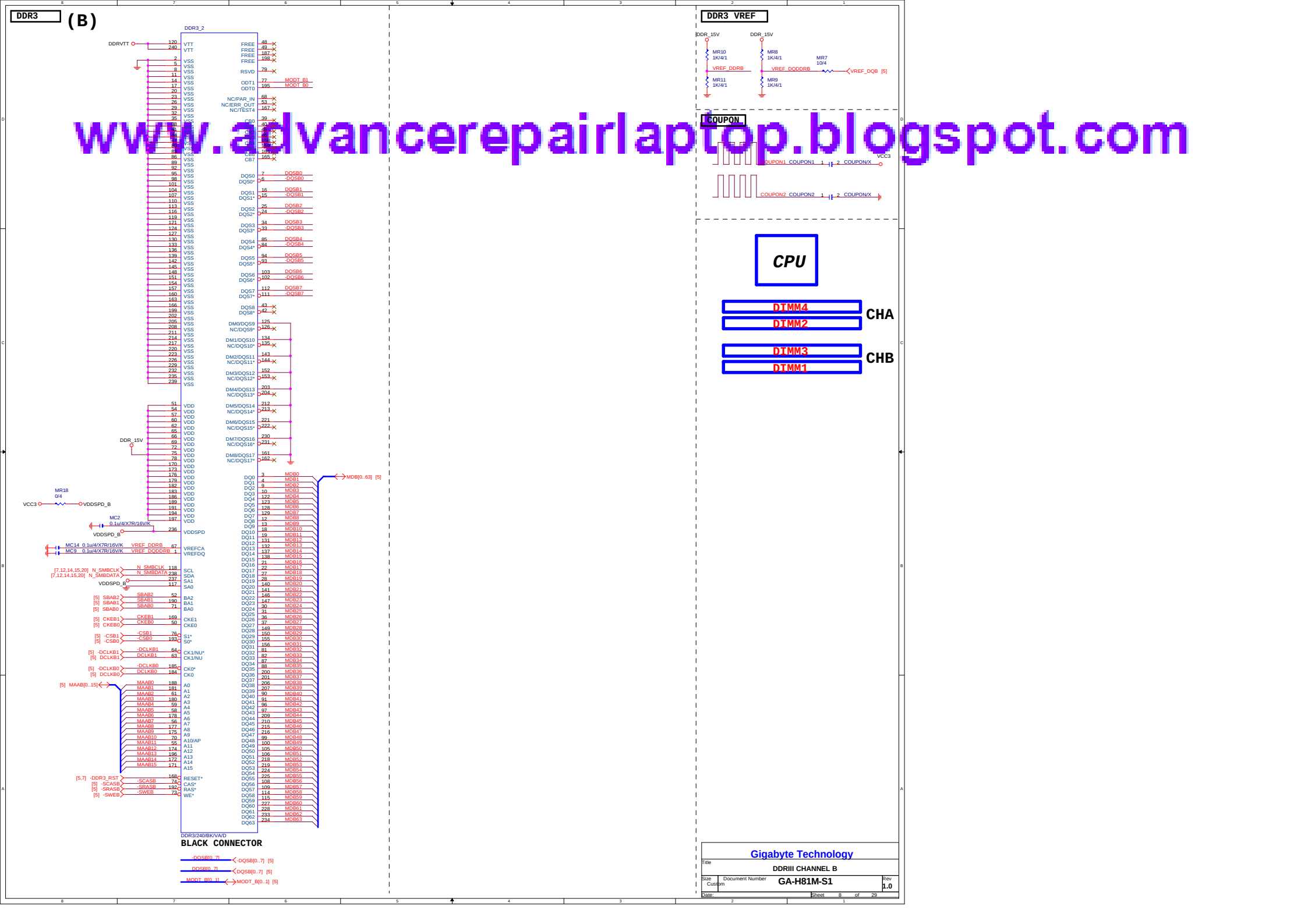

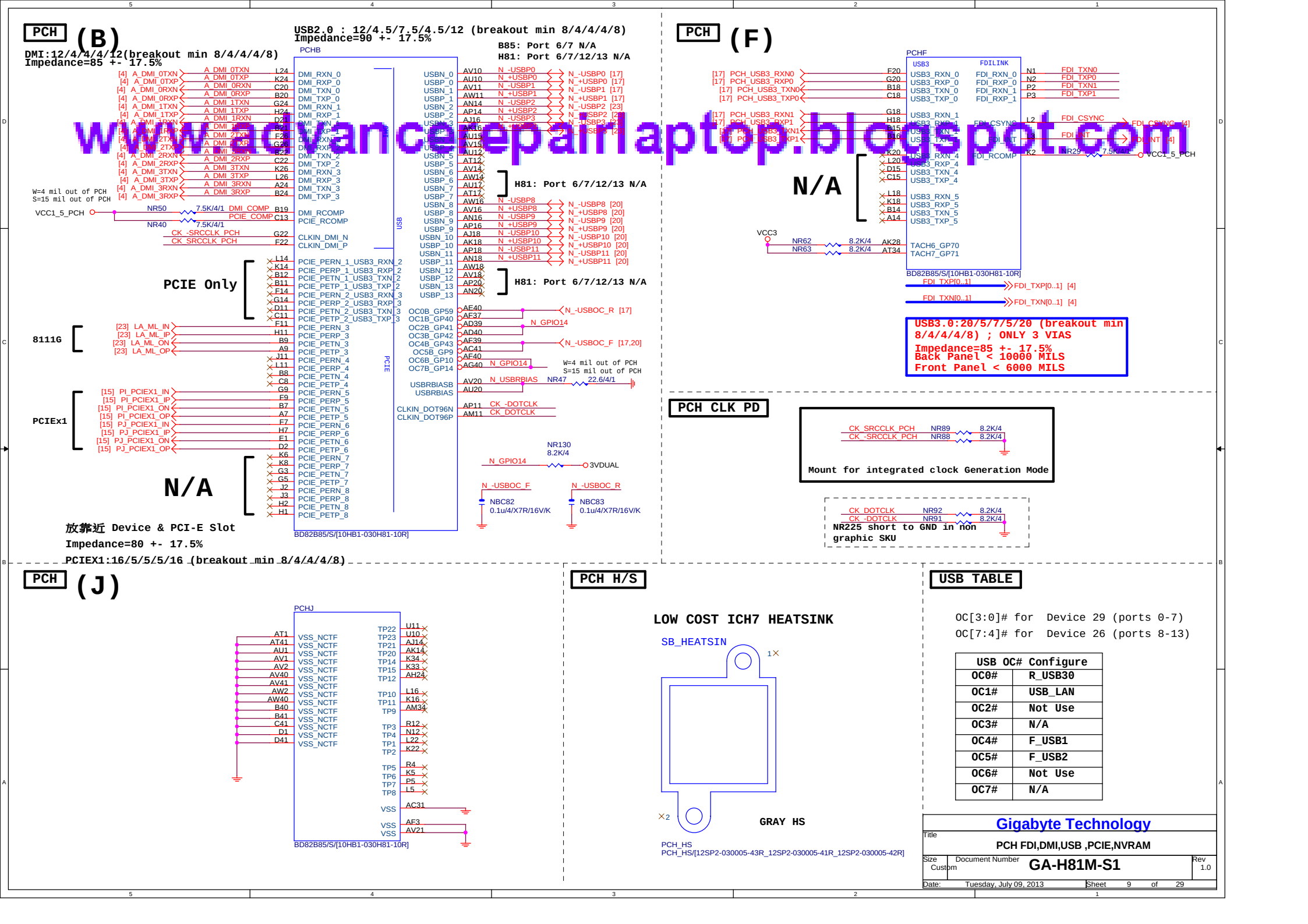

PCH (E)

PCIE

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

PCH (G)

PCHG

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

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

PCIEx16

PCIEx1

8111F

PCIEx1

8892

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

PCH CLK PD

Mount for integrated clock Generation Mode

VGA DDC

VGA CONNECTOR

VGA ESD

AZC099-04S/SOT23-6L

SSOP6_ESD

VGA DDC

Close to Filter

BLACK CONNECTOR

Gigabyte Technology	
Title	PCH DISPLAY ,CLK BUFFER
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PCH (C)

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

PCHC

[6,12,16] O_PWROK1 — NR177 0/4 — N_ME_PWROK — AA32
NC26 100p/4/NPO/50V/J/X

U36 CL_CLK
U35 CL_DATA
U34 CL_RSTB
APWROK

AL31 PWM0
AM31 PWM1
AP31 PWM2
AV30 PWM3

TACH0_GP17
TACH1_GP1
TACH2_GP6
TACH3_GP7
TACH4_GP68
TACH5_GP69

[17] N_GPIO1
N_GPIO17 AP28
N_GPIO1 AT31
N_GPIO6 AM28
N_GPIO7 AV34
N_GPIO68 AT30
N_GPIO69 AV35

[16] N_SSTCTL — AJ31 — SSTCTL

N_GPIO22 L38 SCLOCK_GP22
N_GPIO38 H41 SLOAD_GP38
N_GPIO39 R31 SDATAOUT0_GP39
N_GPIO48 L40 SDATAOUT1_GP48

CLINK
FAN
GPIO
HOST

SATA_RXN_0 B28 N_SATA0RXN
SATA_RXP_0 A28 N_SATA0RXP
SATA_TXN_0 F31 N_SATA0TXN
SATA_TXP_0 H31 N_SATA0TXP
SATA_RXN_1 D30 N_SATA1RXN
SATA_RXP_1 C30 N_SATA1RXP
SATA_TXN_1 B34 N_SATA1TXN
SATA_TXP_1 C34 N_SATA1TXP
SATA_RXN_2 A31
SATA_RXP_2 B31
SATA_TXN_2 B35
SATA_TXP_2 D35
SATA_RXN_3 B32
SATA_RXP_3 C32
SATA_TXN_3 G33
SATA_TXP_3 F33

N/A

SATA_RXN_4_PCIE_PERN_1 A26 N_SATA4RXN
SATA_RXP_4_PCIE_PERP_1 B26 N_SATA4RXP
SATA_TXN_4_PCIE_PETN_1 L28 N_SATA4TXN
SATA_TXP_4_PCIE_PETP_1 K28 N_SATA4TXP
SATA_RXN_5_PCIE_PERN_2 C27 N_SATA5RXN
SATA_RXP_5_PCIE_PERP_2 B27 N_SATA5RXP
SATA_TXN_5_PCIE_PETN_2 G28 N_SATA5TXN
SATA_TXP_5_PCIE_PETP_2 F28 N_SATA5TXP
CLKIN_SATA_N H35 CK_-SRCCLK_SATA
CLKIN_SATA_P H36 CK_SRCCLK_SATA

SATALEDB J39 — N_-SATALED [20]
SATA_RCOMP D33 — NR68 7.5K/4/1 — VCC1_5_PCH
SATA3COMP

SATA0GP_GP21 M37 N_GPIO21 — N_GPIO21 [25]
SATA1GP_GP19 J40 N_GPIO19
SATA2GP_GP36 H40 N_GPIO36
SATA3GP_GP37 N41 N_GPIO37
SATA4GP_GP16 M39 N_GPIO16
SATA5GP_GP49 N40 N_GPIO49

EDP_BKLTCTL AP2
EDP_BKLTEN AT2
EDP_VDDEN AP1

RSVD N30 N_A20GATE — N_A20GATE [16]
RCINB K36 N_-KBRST — N_-KBRST [16]
SERIRQ G39 N_SERIRQ — N_SERIRQ [16]
THRMTRIPB C40 A_-THRMTRIP — A_-THRMTRIP [4,16]
PECI G40 SB_PECI — NR85 0/4/X A_PECI — A_PECI [4,16]
PM_SYNCH F40 — A_PMSYNC [4]
PLTRST_PROCB F41 A_-CPURST — A_-CPURST [4,16]

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

PCH (A)

3VDUAL_PCH
[10] N_PCH33 — NR124 8.2K/4/X — N_-P_PME AA31
N_PCH33 AM22

PCHA
PMEB
CLKIN_33MHZLOOPBACK
TP16 A2
TP17 A3
TP18 B2
TP19 B1
TP_IRE C3
NR30 8.2K/4 — TD_VREF AU29
N_-PIRQA AU29
N_-PIRQB AU27
N_-PIRQC AW28
N_-PIRQD AV27
N_-PIRQE AR30
N_-PIRQF AV29
N_-PIRQG AV28
N_-PIRQH AT27
PIRQAB
PIRQBB
PIRQCB
PIRQDB
GPIO2
GPIO3
GPIO4
GPIO5

PLTRSTB AA37 — N_-PFMRST [16]
GP35/NMIB
GP50 M40 N_GPIO35
GP51 AH26 N_GPIO50
GP52 AU31 N_GPIO51
GP53 AJ26 N_GPIO52
GP54 AV33 N_GPIO54
GP55 R30 N_GPIO53

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

PCH CLK PD

CK_SRCCLK_SATA NR174 8.2K/4
CK_-SRCCLK_SATA NR173 8.2K/4

Mount for integrated clock Generation Mode

PCH PU/PD

NRN2 8.2K/8P4R/4 — VCC3
N_-PIRQC 1 2
N_-PIRQH 3 4
N_-PIRQD 5 6
N_-PIRQB 7 8

NRN3 8.2K/8P4R/4
N_-PIRQE 1 2
N_-PIRQF 3 4
N_-PIRQA 5 6
N_-PIRQG 7 8

NRN7 8.2K/8P4R/4 — VCC3
N_GPIO6 1 2
N_GPIO17 3 4
N_GPIO52 5 6
N_GPIO50 7 8

N_GPIO55 NR160 1K/4/1/X
N_GPIO51 NR55 1K/4/1/X
N_GPIO53 NR53 1K/4/1/X

VCC3

NRN11 8.2K/8P4R/4
N_GPIO48 1 2
N_GPIO35 3 4
N_GPIO16 5 6
7 8

NRN12 8.2K/8P4R/4
N_SERIRQ 1 2
N_GPIO38 3 4
N_GPIO19 5 6
N_GPIO22 7 8

PCIE/MSATA MUX SELECT
NR167 1K/4/1/X
MFG MODE
NR80 1K/4/1/X

NRN13 8.2K/8P4R/4
N_GPIO49 1 2
[121] N_-PCI_STOP — N_-PCI_STOP 3 4
N_A20GATE 5 6
PCH CONFIG
NR157 1K/4/1/X N_GPIO39 7 8

GFX SELECT
DMI RX TERMINATION
N_-KBRST NR161 1K/4/1
NR84 1K/4/1/X N_GPIO36 NR148 8.2K/4/X

SV DETECT
NR66 1K/4/1/X N_GPIO69 NR65 8.2K/4/X
N_GPIO55 NR244 8.2K/4
N_GPIO21 NR250 1K/4/1

NRN4 8.2K/8P4R/4 — VCC3
1 2 N_GPIO68
3 4 N_GPIO1
5 6 N_GPIO54
7 8 N_GPIO7

NR61 8.2K/4/X N_GPIO17
NR113 8.2K/4/X N_GPIO19

SATA CONNECTOR

N_SATA0TXP 0.01u/4/X7R/25V/K NC44 N_SATA0TXPC
N_SATA0TXN 0.01u/4/X7R/25V/K NC43 N_SATA0TXNC
N_SATA0RXN 0.01u/4/X7R/25V/K NC38 N_SATA0RXNC
N_SATA0RXP 0.01u/4/X7R/25V/K NC37 N_SATA0RXPC

1 GND
2 T+
3 T-
4 GND
5 R-
6 R+
7 GND

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

N_SATA1TXP 0.01u/4/X7R/25V/K NC42 N_SATA1TXPC
N_SATA1TXN 0.01u/4/X7R/25V/K NC41 N_SATA1TXNC
N_SATA1RXN 0.01u/4/X7R/25V/K NC40 N_SATA1RXNC
N_SATA1RXP 0.01u/4/X7R/25V/K NC39 N_SATA1RXPC

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

H81 Port 2/3 N/A

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

N_SATA4TXP NC45 0.01u/4/X7R/25V/K N_SATA4TXPC
N_SATA4TXN NC46 0.01u/4/X7R/25V/K N_SATA4TXNC
N_SATA4RXN NC47 0.01u/4/X7R/25V/K N_SATA4RXNC
N_SATA4RXP NC48 0.01u/4/X7R/25V/K N_SATA4RXPC

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

N_SATA5TXP NC57 0.01u/4/X7R/25V/K N_SATA5TXPC
N_SATA5TXN NC56 0.01u/4/X7R/25V/K N_SATA5TXNC
N_SATA5RXN NC55 0.01u/4/X7R/25V/K N_SATA5RXNC
N_SATA5RXP NC54 0.01u/4/X7R/25V/K N_SATA5RXPC

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

ME PWROK

TLS Setting
NR249 8.2K/4/X — VCC3
NR146 1K/4/1/X N_GPIO37 — NR110 8.2K/4/X — 3VDUAL

GPIO37 PU VCC3 ENABLE SBA
For H87&B85

GPIO38 Ctrl

VCC3
N_GPIO38 NR114 8.2K/4/X
NQ13
MMBT2222A/SOT23/600mA/40
SOT23
[12] N_GPIO60 — NR184 8.2K/4

Title	PCH HOST , SATA, PCI		
Size: Custom	Document Number: GA-H81M-S1	Rev: 1.0	
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Gigabyte Technology

PCH (D)

PCHD

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

ACZ_SDOUT

SPI OVERRIDE PROTECTION

PCH PU/PD

PCH_DPWROK

HSW_STRAP13

32.768KHZ

CLR_CMOS

BATTERY-DUAL-4

RB 必須放在BAT外

Reserve for EMI test

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

At least 10ms delay after 3VDUAL_PCH stabel

Gigabyte Technology	
Title	PCH GPIO , CTRL , AUDIO
Size: Custom	Document Number: GA-H81M-S1
Rev: 1.0	
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PCH (H)

PCHH

VCC1_05_PCH
VCC1_05_ME
VCC1_05_DCB
VCC1_5_PCH
VCC3_DAC
VCC3
3VDUAL
3VDUAL_PCH
V_PROC_IO
N_RTCVDD [12,18]
V_1P05_DSW_INT
V_1P5_RTC_INT
V_1P5_INT
VCCIO2PCH
NTP1
NTP2
NTP3
VCCADAC1_5

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

VCC3_DAC

CLOSE北橋(注意震盪水波紋)

3VDUAL
VCC3_DAC
+12V
NR185 8.2K/4
NQ17 2N7002/SOT23/25pF/5
NBC7 10u/6/X5R/6.3V/M
(3.3V/70mA+360uA)

3VDUAL_PCH

NQ9 L1117LG/N/SOT223/1A
5VSB
3VDUAL_PCH
NR176 301/4/1
NR180 510/4/1
NBC66 22u/8/X5R/6.3V/M
NBC67 0.1u/4/X7R/16V/K
NBC68 1u/4/X5R/6.3V/K

SHT PWR

VCC3_ME
VCC3
VCC1_05_ME
VCC1_05_PCH

CAP

VCC3_ME
3VDUAL_PCH
NBC58 1u/4/X5R/6.3V/K
NBC65 1u/4/X5R/6.3V/K

(3.3V)(X6)

VCC3
NBC24 10u/6/X5R/6.3V/M
NBC25 1u/4/X5R/6.3V/K
NBC26 1u/4/X5R/6.3V/K
NBC27 1u/4/X5R/6.3V/K
NBC20 1u/4/X5R/6.3V/K
NBC59 1u/4/X5R/6.3V/K

(1.05V)(X5)

VCC1_05_ME
NBC8 10u/6/X5R/6.3V/M
NBC10 1u/4/X5R/6.3V/K
NBC14 0.1u/4/X7R/16V/K
NBC11 1u/4/X5R/6.3V/K
NBC13 1u/4/X5R/6.3V/K

(1.05V)(X6)

VCC1_05_PCH
NBC39 10u/6/X5R/6.3V/M
NBC40 1u/4/X5R/6.3V/K
NBC41 0.1u/4/X7R/16V/K
NBC42 1u/4/X5R/6.3V/K
SNBC1 1u/4/X5R/6.3V/K
SNBC2 1u/4/X5R/6.3V/K

(1.05V)(X2)

VCCIO2PCH
NBC56 1u/4/X5R/6.3V/K
NBC57 0.1u/4/X7R/16V/K

(3.3V)(X2)

3VDUAL
NBC60 1u/4/X5R/6.3V/K
NBC63 0.1u/4/X7R/16V/K

(1.05V)(X10)

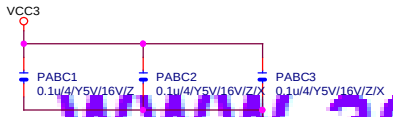
VCC1_5_PCH
NBC16 10u/6/X5R/6.3V/M
NBC29 10u/6/X5R/6.3V/M
NBC50 10u/6/X5R/6.3V/M
NBC53 10u/6/X5R/6.3V/M
NBC19 1u/4/X5R/6.3V/K
NBC23 0.1u/4/X7R/16V/K
NBC28 1u/4/X5R/6.3V/K
NBC44 1u/4/X5R/6.3V/K
NBC46 0.1u/4/X7R/16V/K
NBC48 1u/4/X5R/6.3V/K

PCH (I)

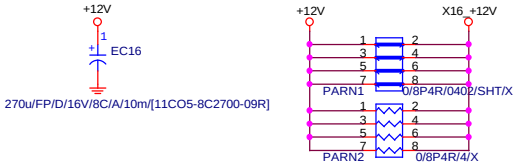
PCHI
BD82B85/S/[10HB1-030H81-10R]

Gigabyte Technology	
Title	PCH PWR ,GND
Size: Custom	Document Number: GA-H81M-S1
Rev	1.0
Date: Tuesday, July 09, 2013	Sheet 13 of 29

PCIEX16 CAP



PCIEX16 PROTECT SHT



PCIEX16 AC CAP

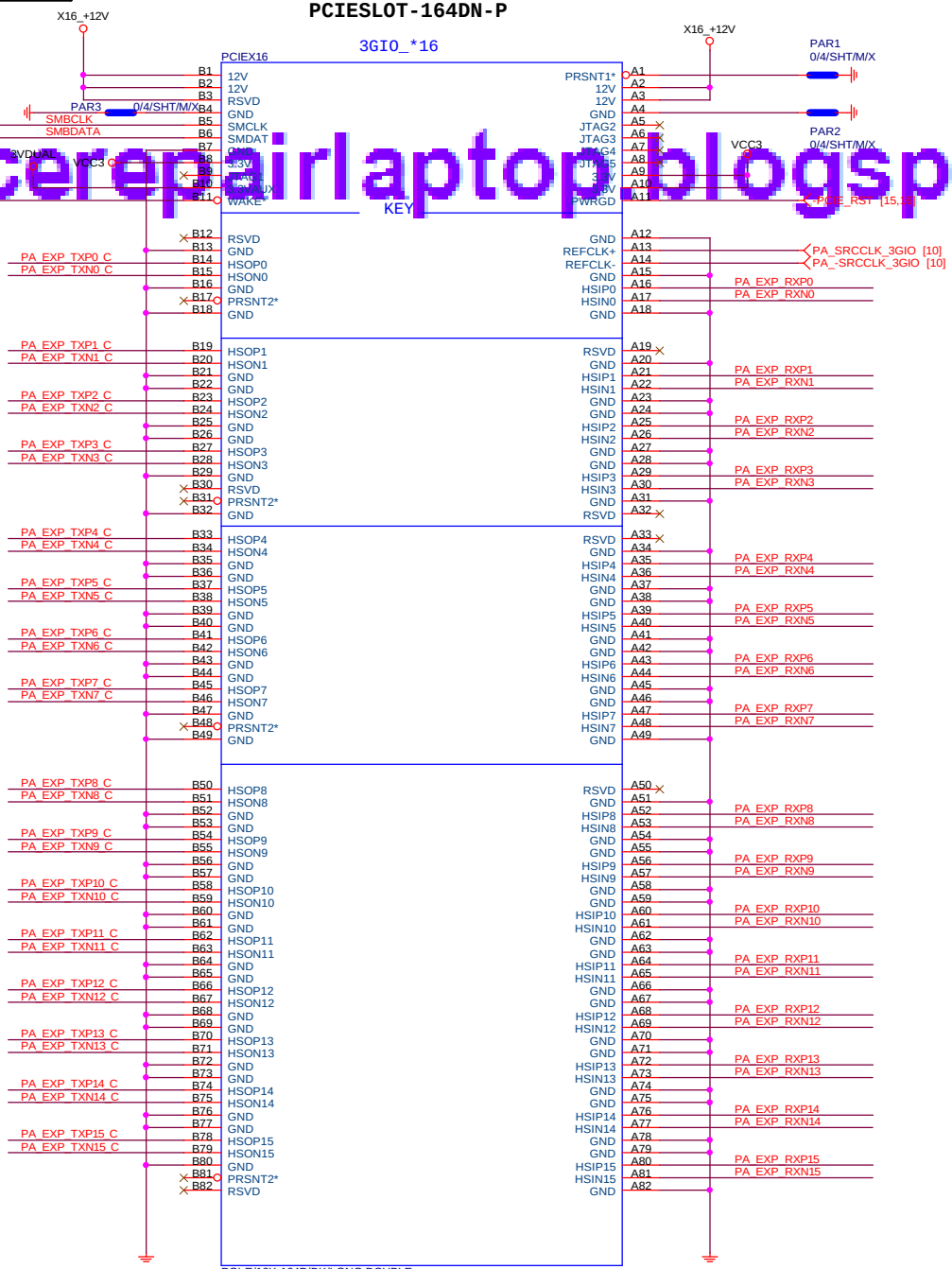
PA_EXP_TXP0	PAC5	0.22u/4/X5R/6.3V/K	PA_EXP_TXP0_C
PA_EXP_TXN0	PAC4	0.22u/4/X5R/6.3V/K	PA_EXP_TXN0_C
PA_EXP_TXP1	PAC6	0.22u/4/X5R/6.3V/K	PA_EXP_TXP1_C
PA_EXP_TXN1	PAC7	0.22u/4/X5R/6.3V/K	PA_EXP_TXN1_C
PA_EXP_TXP2	PAC8	0.22u/4/X5R/6.3V/K	PA_EXP_TXP2_C
PA_EXP_TXN2	PAC9	0.22u/4/X5R/6.3V/K	PA_EXP_TXN2_C
PA_EXP_TXP3	PAC10	0.22u/4/X5R/6.3V/K	PA_EXP_TXP3_C
PA_EXP_TXN3	PAC11	0.22u/4/X5R/6.3V/K	PA_EXP_TXN3_C
PA_EXP_TXP4	PAC12	0.22u/4/X5R/6.3V/K	PA_EXP_TXP4_C
PA_EXP_TXN4	PAC13	0.22u/4/X5R/6.3V/K	PA_EXP_TXN4_C
PA_EXP_TXP5	PAC14	0.22u/4/X5R/6.3V/K	PA_EXP_TXP5_C
PA_EXP_TXN5	PAC15	0.22u/4/X5R/6.3V/K	PA_EXP_TXN5_C
PA_EXP_TXP6	PAC16	0.22u/4/X5R/6.3V/K	PA_EXP_TXP6_C
PA_EXP_TXN6	PAC17	0.22u/4/X5R/6.3V/K	PA_EXP_TXN6_C
PA_EXP_TXP7	PAC19	0.22u/4/X5R/6.3V/K	PA_EXP_TXP7_C
PA_EXP_TXN7	PAC18	0.22u/4/X5R/6.3V/K	PA_EXP_TXN7_C
PA_EXP_TXP8	PAC20	0.22u/4/X5R/6.3V/K	PA_EXP_TXP8_C
PA_EXP_TXN8	PAC21	0.22u/4/X5R/6.3V/K	PA_EXP_TXN8_C
PA_EXP_TXP9	PAC22	0.22u/4/X5R/6.3V/K	PA_EXP_TXP9_C
PA_EXP_TXN9	PAC23	0.22u/4/X5R/6.3V/K	PA_EXP_TXN9_C
PA_EXP_TXP10	PAC24	0.22u/4/X5R/6.3V/K	PA_EXP_TXP10_C
PA_EXP_TXN10	PAC25	0.22u/4/X5R/6.3V/K	PA_EXP_TXN10_C
PA_EXP_TXP11	PAC26	0.22u/4/X5R/6.3V/K	PA_EXP_TXP11_C
PA_EXP_TXN11	PAC27	0.22u/4/X5R/6.3V/K	PA_EXP_TXN11_C
PA_EXP_TXP12	PAC28	0.22u/4/X5R/6.3V/K	PA_EXP_TXP12_C
PA_EXP_TXN12	PAC29	0.22u/4/X5R/6.3V/K	PA_EXP_TXN12_C
PA_EXP_TXP13	PAC30	0.22u/4/X5R/6.3V/K	PA_EXP_TXP13_C
PA_EXP_TXN13	PAC31	0.22u/4/X5R/6.3V/K	PA_EXP_TXN13_C
PA_EXP_TXP14	PAC32	0.22u/4/X5R/6.3V/K	PA_EXP_TXP14_C
PA_EXP_TXN14	PAC33	0.22u/4/X5R/6.3V/K	PA_EXP_TXN14_C
PA_EXP_TXP15	PAC34	0.22u/4/X5R/6.3V/K	PA_EXP_TXP15_C
PA_EXP_TXN15	PAC35	0.22u/4/X5R/6.3V/K	PA_EXP_TXN15_C

PA_EXP_RXP[0..15] >> PA_EXP_RXP[0..15] [4]
PA_EXP_RXN[0..15] >> PA_EXP_RXN[0..15] [4]
PA_EXP_TXP[0..15] >> PA_EXP_TXP[0..15] [4]
PA_EXP_TXN[0..15] >> PA_EXP_TXN[0..15] [4]

PCIEX16 SLOT

PCIESLOT-164DN-P

3GIO_*16



BLACK CONNECTOR

Gigabyte Technology		
Title: PCI EXPRESS * 16		
Size: Custom	Document Number: GA-H81M-S1	Rev: 1.0
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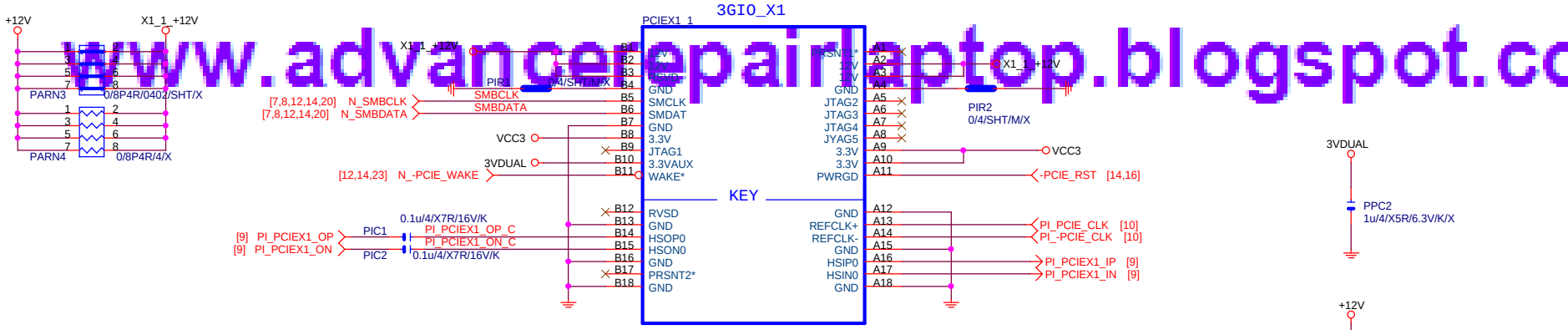
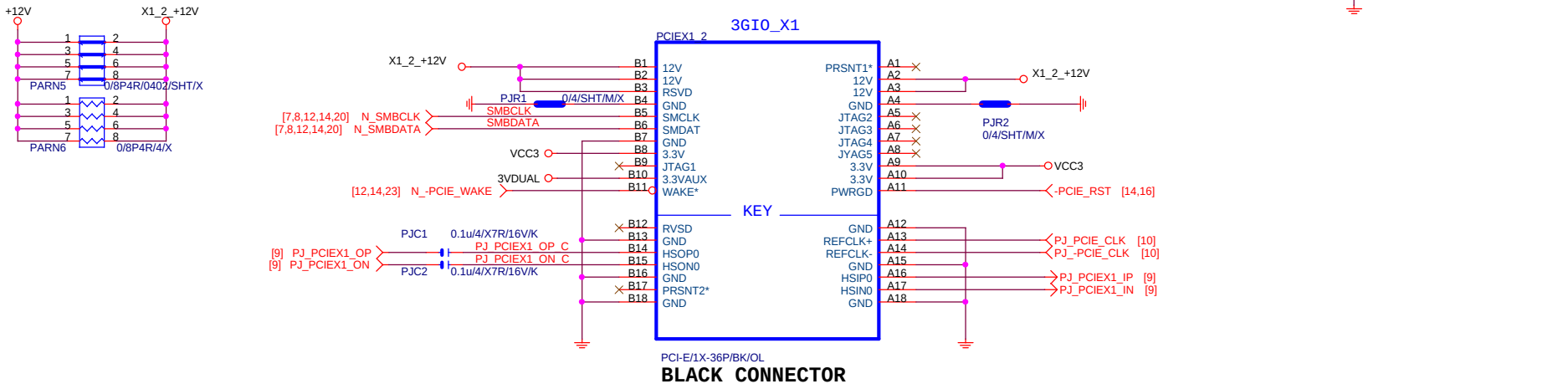
PCIEX1 SLOT

PCIEX1 PROTECT SHT





Gigabyte Technology		
Title: PCI EXPRESS X 1 PORT		
Size: Custom	Document Number: GA-H81M-S1	Rev: 1.0
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SIO IT8620

IT8620E_BX

IT8620E/BX/S

-PRCOHOT

-THRMTRIP

PWR SHT

For 8728 EUP function

3VDUAL_PCH — OR8 0/4 — IT_VCCH

VCC3 — OR9 0/4 — IT_AVCC

SIO PU

DS_ME — OR11 1K/4/4 — 3VDUAL_PCH

N_SSTCTL — OR12 8.2K/4 — 3VDUAL_PCH

-PROCHOT_CON — OR13 8.2K/4 — VCC3

N_-LDRQ0 — OR14 1K/4/1 — VCC3

ITE_PWROK2 — OR15 1K/4/1 — VCC3

ITE_PWROK1 — OR16 1K/4/1 — VCC3

-PCIE_RST — OR17 1K/4/1 — VCC3

-PFMRST2 — OR18 1K/4/1 — VCC3

[18] FANPWM1 — FANPWM1 — OR19 8.2K/4 — VCC

[18] FANPWM2 — FANPWM2 — OR20 8.2K/4 — VCC

SIO STRAP

H61M-S2 1.1 JP6 stuff pull down

JP2 — OR21 8.2K/4 — VCC3

JP3 — OR22 8.2K/4 — VCC3

JP4 — OR23 8.2K/4 — VCC3

JP5 — OR24 8.2K/4/X — VCC3

OR25 8.2K/4/X — ITE recommand

EUP control by PCH

3VDUAL — OR26 100/4/1 28_3VSB

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

Power leakage

IT_AVCC — Q4 2N7002/SOT23/25pF/5 — SOT23 — -PSON — OR27 510/4/1

For IT8721 Power leakage

DUAL BIOS OPT STRAP

H81M-DS1 Single BIOS

CEB_N — OR30 680/4/1 — OR31 1K/4/1/X — VCC3

SIO_18V

internal power pin, max 22nF cap

SIO_18V — OC7 0.1u/4/X7R/16V/K — OC8 0.1u/4/X7R/16V/K/X

MB ID

VCC3 — OR28 8.2K/4 — OR29 8.2K/4/X — MB_ID2

SIO CAP

IT_VCCH — OC9 1u/4/X5R/6.3V/K — OC10 0.1u/4/Y5V/16V/Z/X

IT_VCCH — OC11 10u/6/X5R/6.3V/M

3VDUAL — OC12 1u/4/X5R/6.3V/K

IT_AVCC — OC13 10u/6/X5R/6.3V/M

3VDUAL_PCH — OC14 0.1u/4/Y5V/16V/Z

VREF_25 — OC15 0.1u/4/X7R/16V/K

-CASEOPEN — OC6 1u/4/X5R/6.3V/K

Gigabyte Technology			
Title: PCH GPIO , CTRL , AUDIO			
Size: C	Document Number: GA-H81M-S1		Rev: 1.0
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COM

COM RI

KB/MS

KB_MS ESD

H61M-DS2 R0.2

KB_MS

MSDATA
MSCLK
KBDATA
KBCLK

FUSEVCC_R

BC8
0.1u/4/Y5V/16V/Z

AGND

KB/MS/6P/PC99/OS/RA/D/2

ESD18

KBCLK
KBDATA
MSDATA
MSCLK
FUSEVCC_R

AZC099-04S/SOT23-6L

R707
0/6/X

For EMI

FUSEVCC_R

RN1
8.2K/8P4R/4

MCLK
MDAT
KDAT
KCLK

FOR鹽化短路

[16] KCLK — KCLK — R58 — 82/4 — KBCLK
[16] KDAT — KDAT — R59 — 82/4 — KBDATA
[16] MDAT — MDAT — R57 — 82/4 — MSDATA
[16] MCLK — MCLK — R56 — 82/4 — MSCLK

MSCLK
MSDATA
KBDATA
KBCLK

CN1
180p/8P4C/6/NPO/50V/K

AGND1

USB2.0 PWR

FUSE-0805

5VDUAL — FR1 — FUSEVCC_R

SPR-P200T/6V/8/S

UBEC2
100u/D/10V/57

Close to connector

USB30_20

R_USB30
USB/18P/BU/OS/RA/D/2/1U/SB

USB3.0/2.0

FUSEVCC_USB3_R3 — BC5 — 0.1u/4/Y5V/16V/Z

[9] N_-USBP0
[9] N_+USBP0

[9] PCH_USB3_RXN0
[9] PCH_USB3_RXP0

[9] PCH_USB3_TXN0
[9] PCH_USB3_TXP0

UBC9 — PCH_USB3_TXN0C
UBC10 — PCH_USB3_TXP0C

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

U1 VBUS
U2 D-
U3 D+
U4 GND
U5 SSRX-
U6 SSRX+
U7 GND
U8 SSTX-
U9 SSTX+

U10 VBUS
U11 D-
U12 D+
U13 GND
U14 SSRX-
U15 SSRX+
U16 GND
U17 SSTX-
U18 SSTX+

AGND AGND AGND AGND
G1 G2 G3 G4

N_-USBP1 [9]
N_+USBP1 [9]

BC6 — 0.1u/4/Y5V/16V/Z — FUSEVCC_USB3_R4

PCH_USB3_RXN1 [9]
PCH_USB3_RXP1 [9]

PCH_USB3_TXN1C — UBC11
PCH_USB3_TXP1C — UBC12

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

PCH_USB3_TXN1 [9]
PCH_USB3_TXP1 [9]

USB30_20 PWR

Polyswitch-1206

F12 — SMD1206P350SLR/6V/S — FUSEVCC_USB3_R4

5VDUAL

F11 — SMD1206P350SLR/6V/S — FUSEVCC_USB3_R3

UEC4
100u/D/10V/57

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

-USBOC_R

SOT23

UD7
BAT54A/SOT23/200mA

FUSEVCC_R

UD5
BAT54A/SOT23/200mA

FUSEVCC_USB3_R4
FUSEVCC_USB3_R3

5VDUAL

UR3
8.2K/4

N_-USBOC_R — N_-USBOC_R [9]

UR4
15K/4/1

USB30_20 ESD PROCTECT

USB3.0 ESD

PCH_USB3_TXN1C
PCH_USB3_TXP1C

PCH_USB3_TXP0C
PCH_USB3_TXN0C

NC NC GND NC NC
D1 D1 GND D2 D2

UESD5
AZ1045-04F/MSOP10

PCH_USB3_TXP1C
PCH_USB3_TXN1C

PCH_USB3_TXN0C
PCH_USB3_TXP0C

PCH_USB3_RXN0
PCH_USB3_RXP0

PCH_USB3_RXP1
PCH_USB3_RXN1

UESD6
AZ1045-04F/MSOP10

PCH_USB3_RXP0
PCH_USB3_RXN0

PCH_USB3_RXN1
PCH_USB3_RXP1

USB POWER PROTECT

ESD1

N_-USBP0
N_+USBP1

FUSEVCC_USB3_R4

N_+USBP0
N_-USBP1

AZC099-04S/SOT23-6L

SOT23

[11] N_GPIO1

N_-USBOC_F
N_-USBOC_R

N_-USBOC_F [9,20]

UAD5
BAT54A/SOT23/200mA

N_GPIO1接USBOC,S3/S4/S5會拉LOW

Gigabyte Technology

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

Size: Custom | Document Number: GA-H81M-S1 | Rev: 1.0

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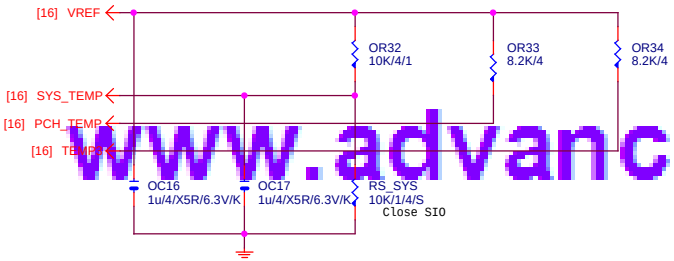
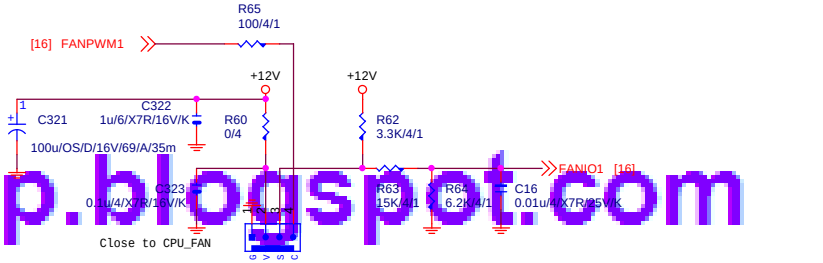
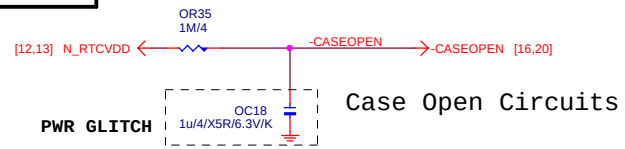
TEMP H/W MONITOR



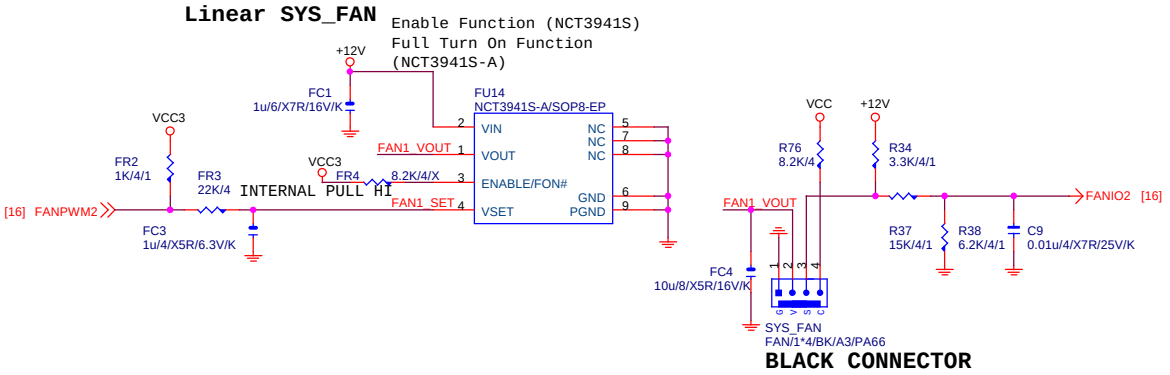
CPU SMART FAN



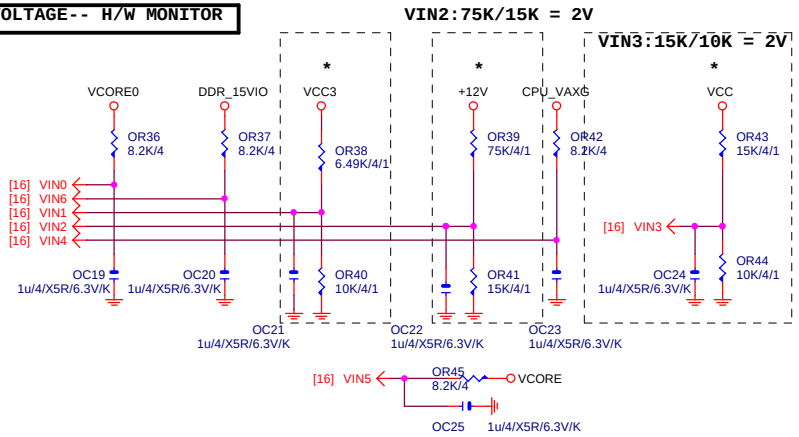
CASE OPEN



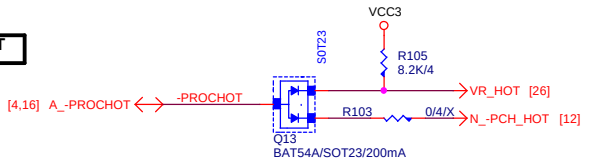
SYS SMART FAN

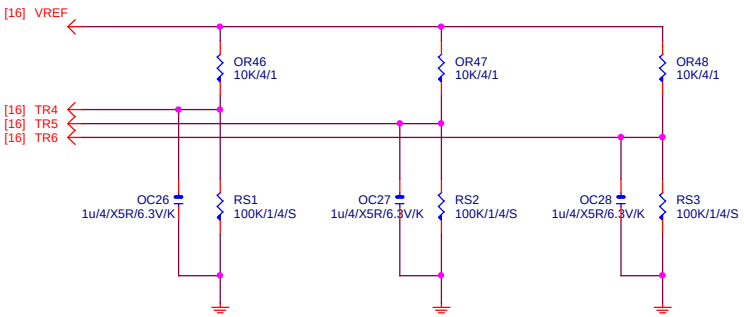


VOLTAGE-- H/W MONITOR



-PROHOT





RS1、RS2、RS3 CLOSE CPU
VR MOSFET

Gigabyte Technology		
Title: HWM,FAN CTRL,OV		
Size: Custom	Document Number: GA-H81M-S1	Rev: 1.0
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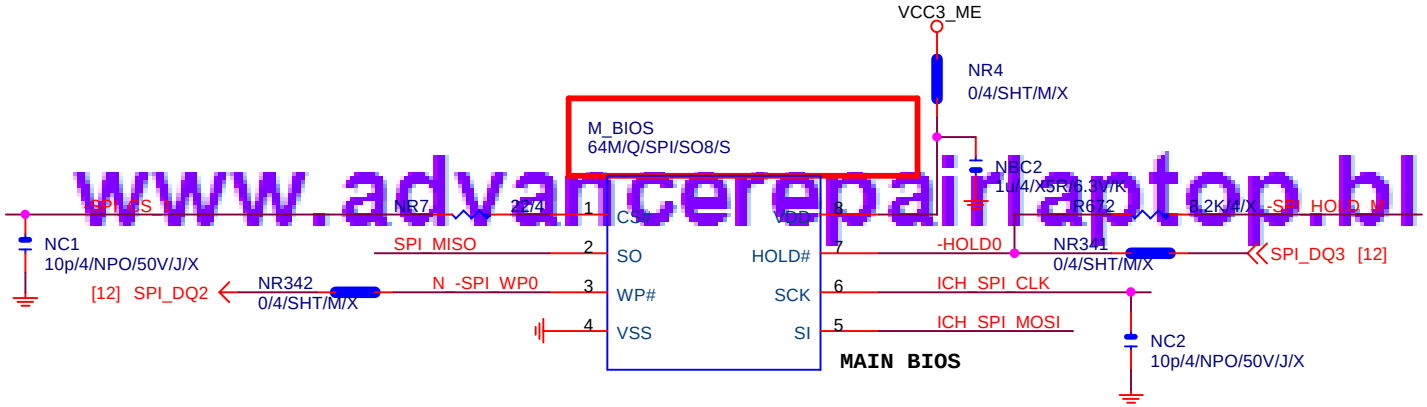
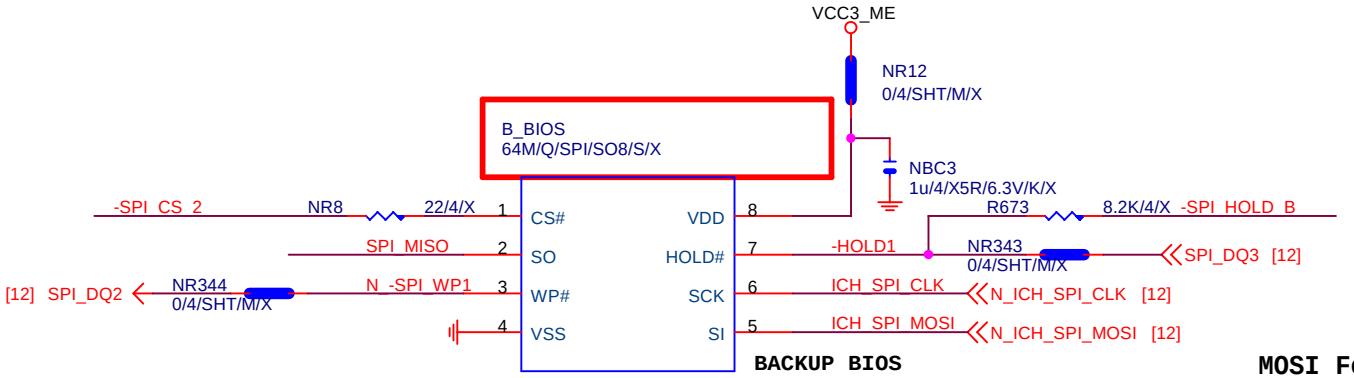
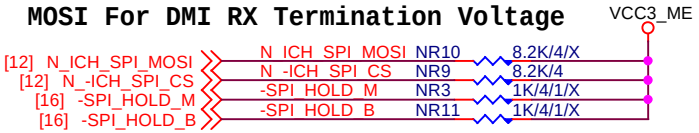
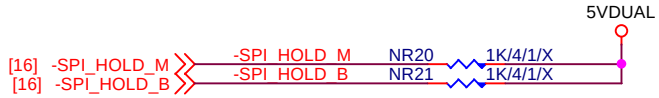


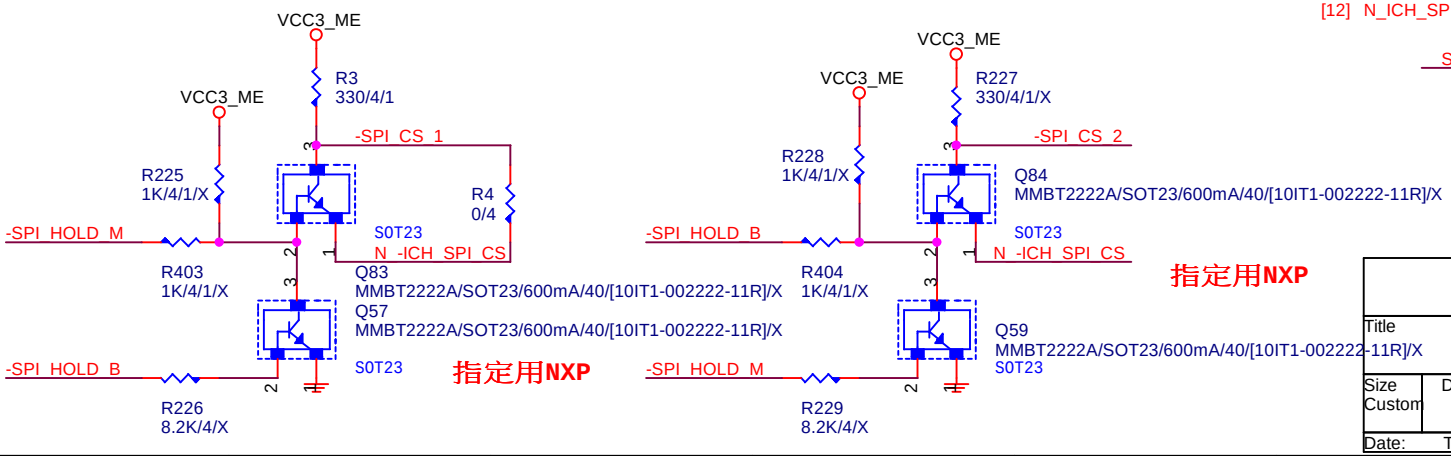


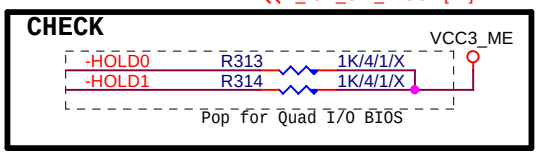
BOOT DEVICE	GNT0	GNT1
LPC	0	0
PCI	0	1
NAND	1	0
SPI	1	1

1 means floating
0 means PD 1K









Gigabyte Technology

Title: DUAL BIOS

Size: Custom | Document Number: GA-H81M-S1 | Rev: 1.0

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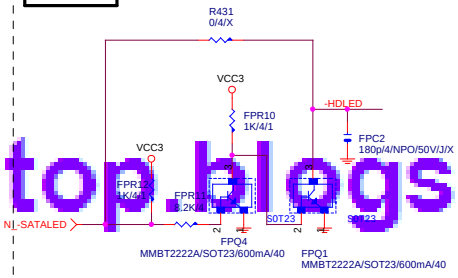
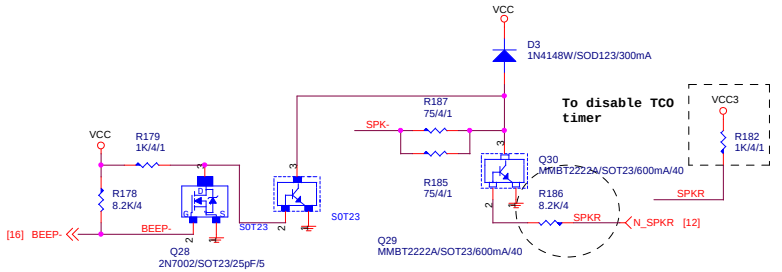
SATA LED

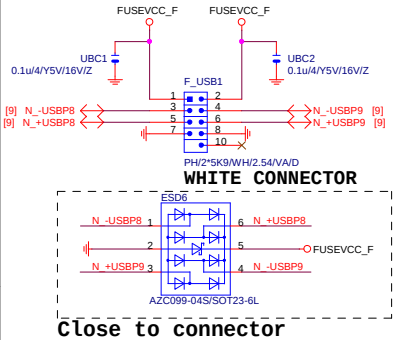


-USBOC_F

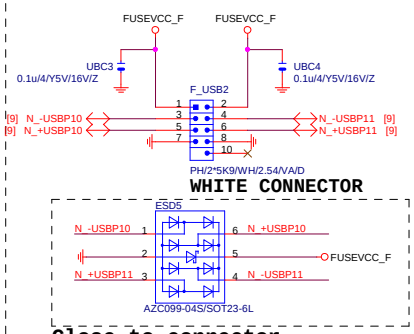
SPKR



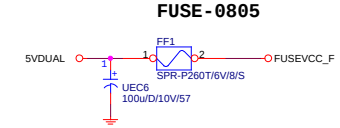
FRONT USB1

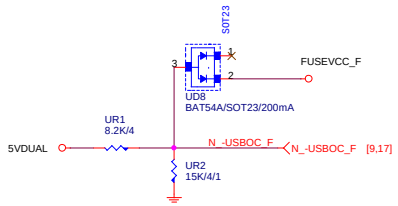


FRONT USB2



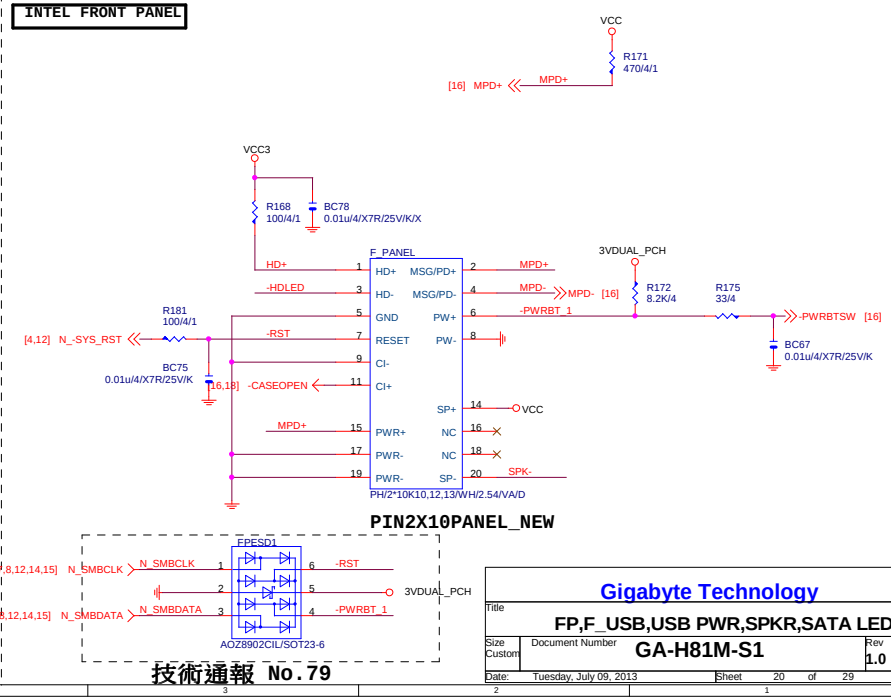
FUSE-0805





F_USB1, F_USB2 4-Port 2.6A

INTEL FRONT PANEL



技術通報 No.79

Gigabyte Technology

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

Size: Custom | Document Number: GA-H81M-S1 | Rev: 1.0

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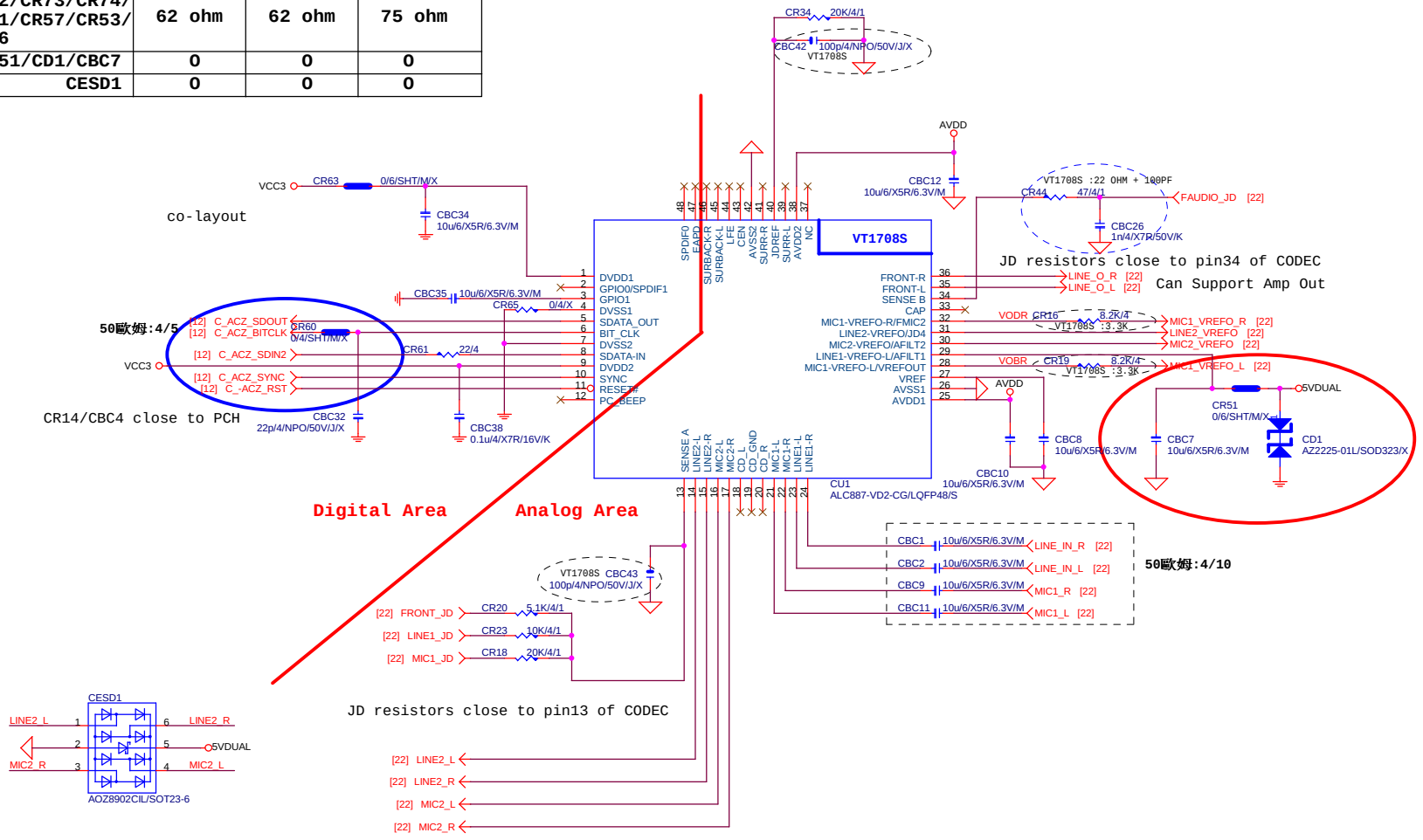
AZALIA CODEC *ALC892/ALC887-VD2/VT1708-CE Colay*

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

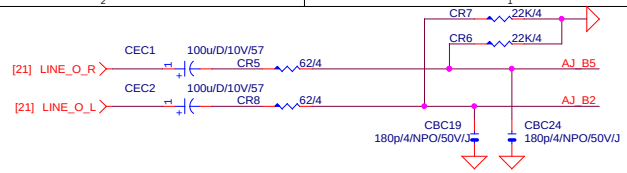


Title	HD AUDIO ALC887B-VD2/VT1708S/VT2021
Size	Custom
Document Number	GA-H81M-S1
Rev	1.0
Date:	Tuesday, July 09, 2013
Sheet	21 of 29

Gigabyte Technology

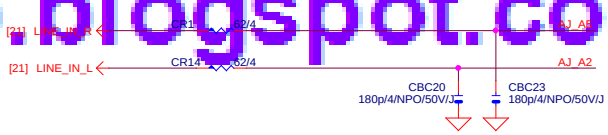
CR49 0/6/SHT/M/X
CR50 0/6/X
CR21 2.2/6
CR24 0/4/SHT/M/X

LINE-OUT



LINE-IN

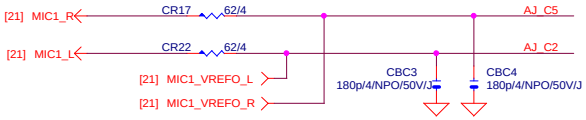
Only reserved for ALC888



Verify MIC function in LINE-in

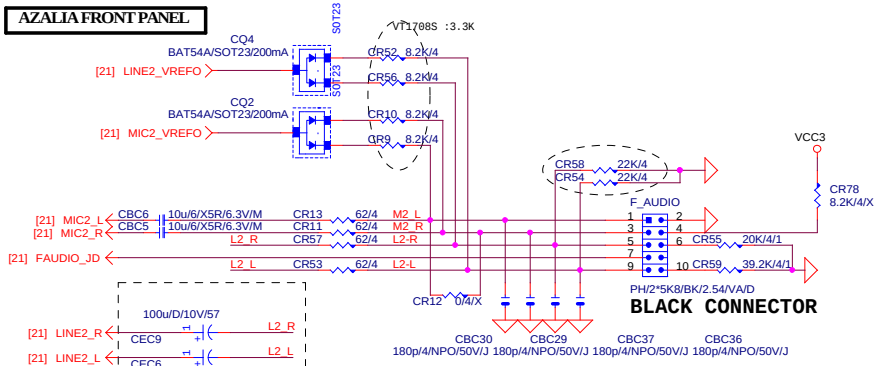
For 889A/888

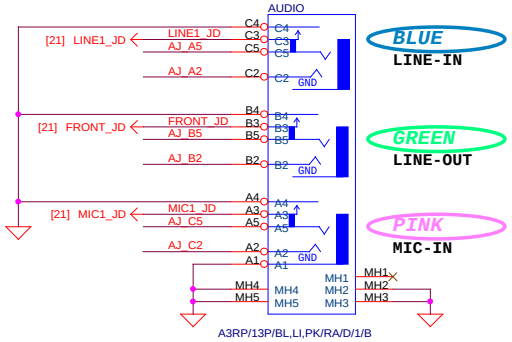
MIC-IN



SPDIF_OUT

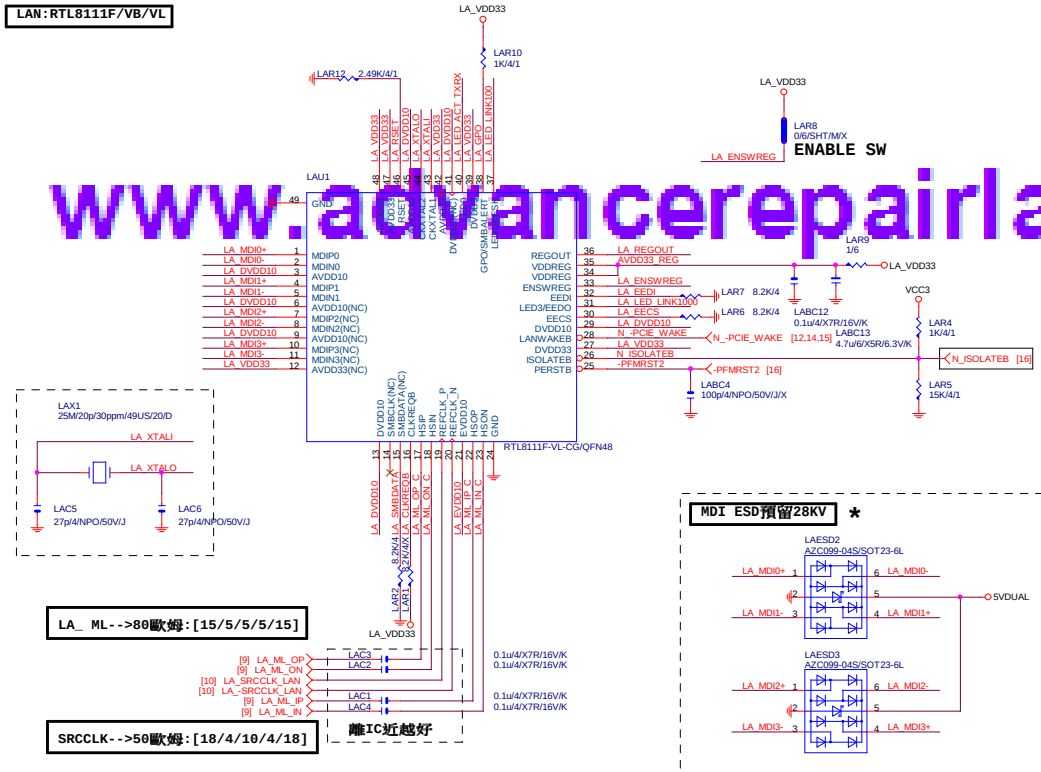
AZALIA FRONT PANEL





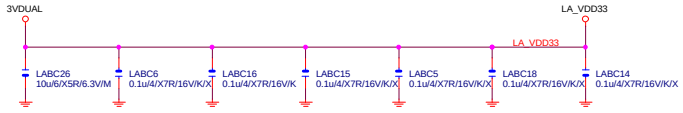
Gigabyte Technology			
Title: AUDIO JACK			
Size: Custom	Document Number: GA-H81M-S1		Rev: 1.0
Date: Tuesday, July 09, 2013	Sheet 22 of 29		

LAN:RTL8111F/VB/VL



MDI ESD預留28KV *

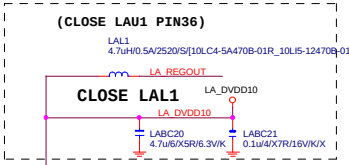
LAN POWER

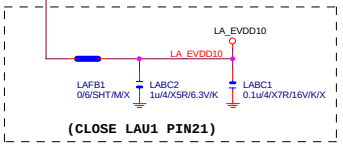


(CLOSE LAU1 PIN:12,27,39,42,47,48)

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

(CLOSE LAU1 PIN36)





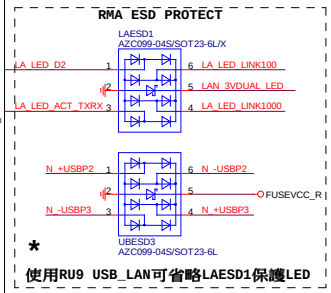
(CLOSE LAU1 PIN21)

Power domain chart

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

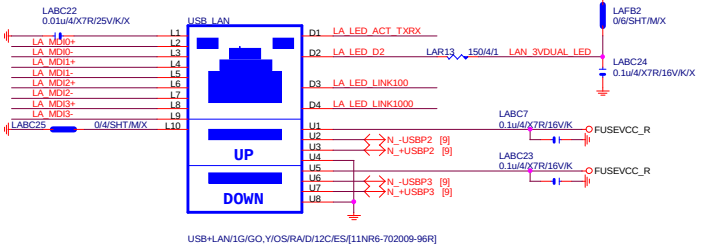
USB_LAN CONNECTOR

RMA ESD PROTECT



* 使用RU9 USB_LAN可省略LAESD1保護LED

LA_MDI-->100歐姆:[20/4/8/4/20]



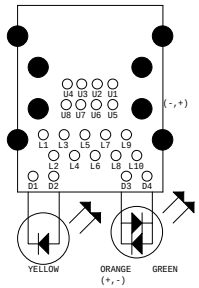
USB+LAN/1G/GO,Y/OS/RA/D/12C/ES/[11NR6-702009-96R]

USB X3 POWER

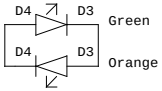
EMI SHORT PAD

PS:視EMI需求

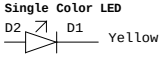
注意:USB PORT(目前:暫代6,7PORT)
USB-->90歐姆:[15/4.5/7.5/4.5/15]



Dual Color LED



Single Color LED



BOM NOTICE *

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

[LED獨立走線,可省略外加AZC099料件LAESD1]

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

Gigabyte Technology

Title: Realtek RTL8111G

Size: Custom | Document Number: GA-H81M-S1 | Rev: 1.0

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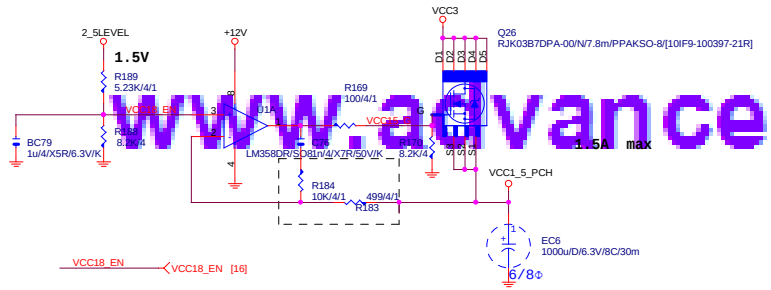
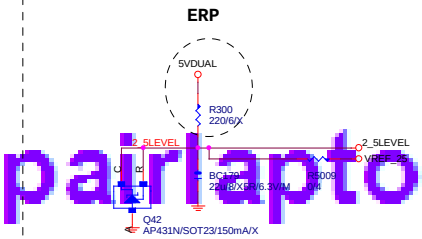
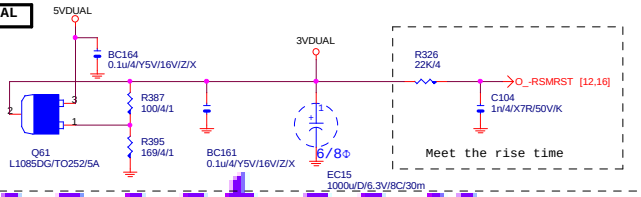
VCC1_8_PCH



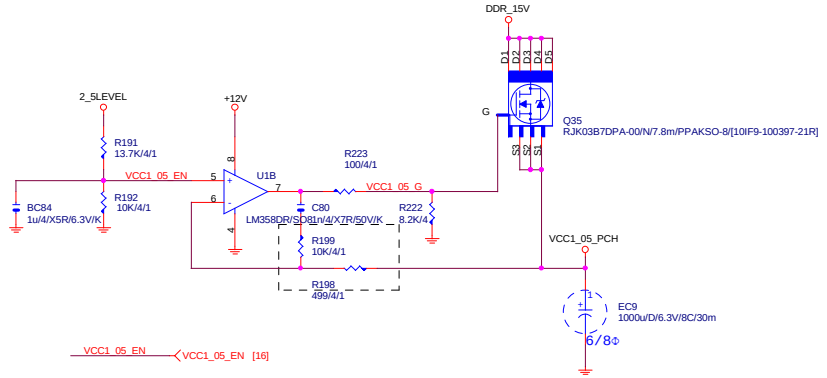
2_5LEVEL

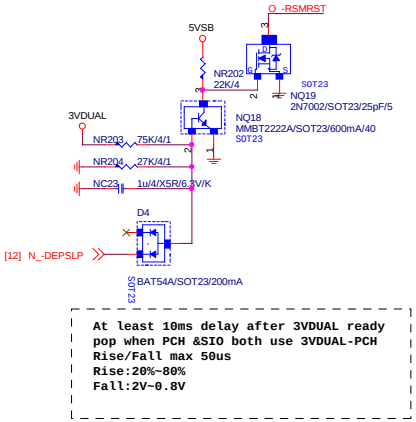


3VDUAL

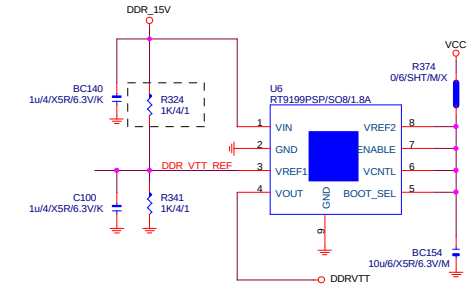


VCC1_05_PCH

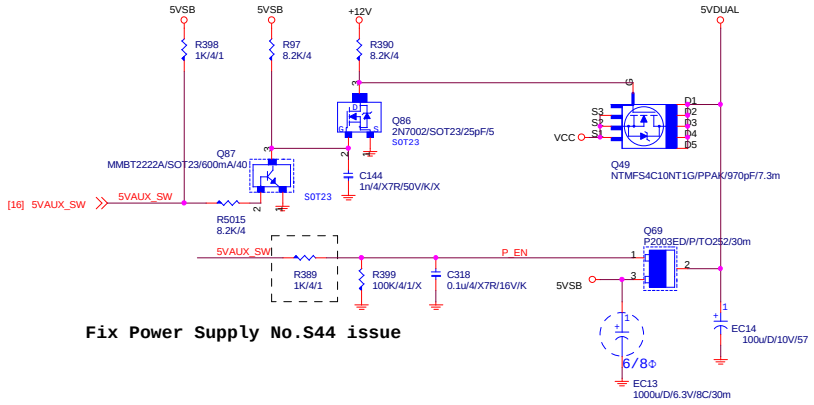




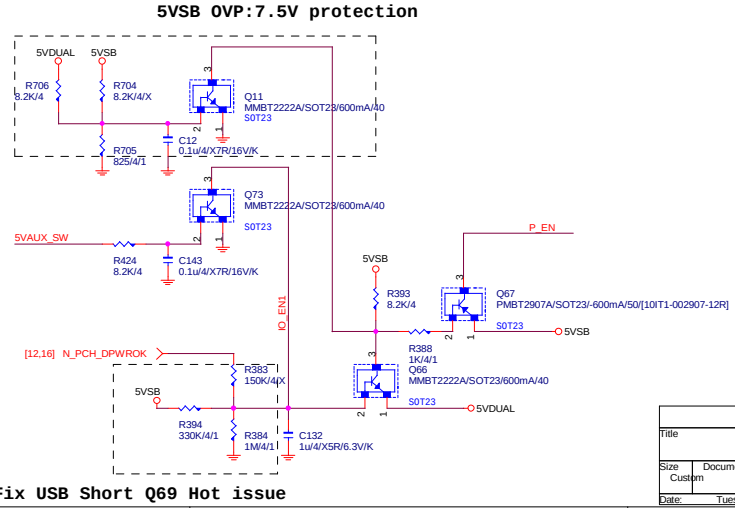
DDRVTT



5VDUAL



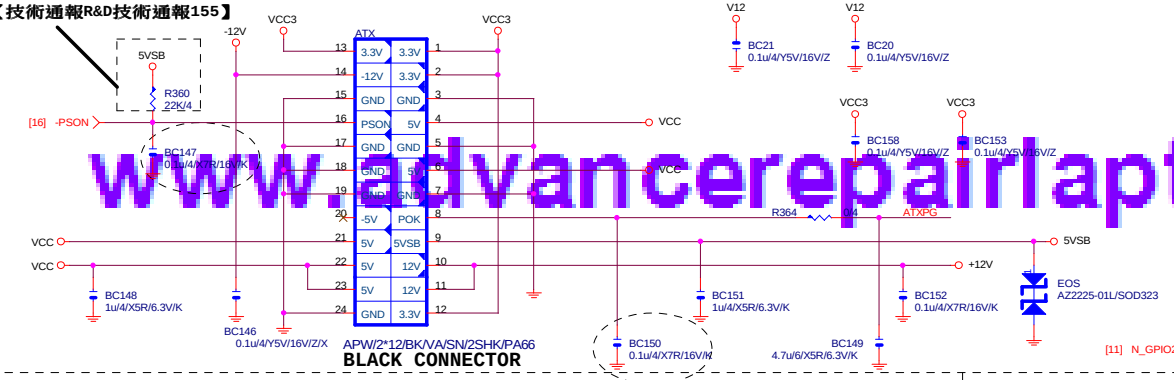
5VDUAL SHORT PROTECT



Gigabyte Technology		
Title: DISCRETE POWER		
Size: Custom	Document Number: GA-H81M-S1	Rev: 1.0
Date: Tuesday, July 09, 2013	Sheet 24 of 29	

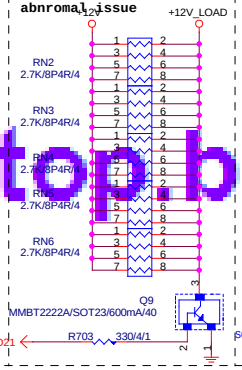
ATXX24 POWER CONNECTOR

【技術通報R&D技術通報155】



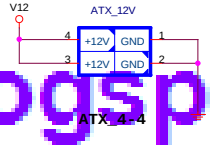
【技術通報R&D技術通報153】

To fix 12V light load abnroma1 issue

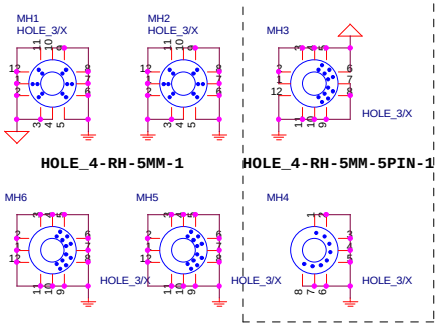


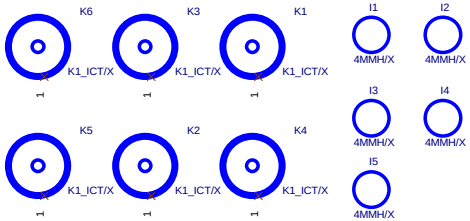
ATXX4 POWER CONNECTOR

APW/2*2/BK/P/4.2/SN/PA66/[11NH4-020004-G2R]



TPM

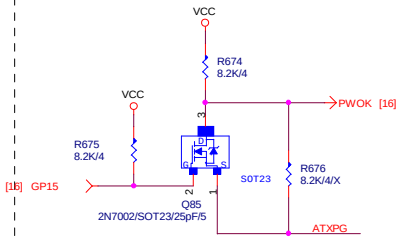


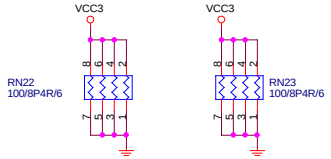


To prevent the 5VSB under loading when boot

PWOK PATCH

【技術通報R&D技術通報154】

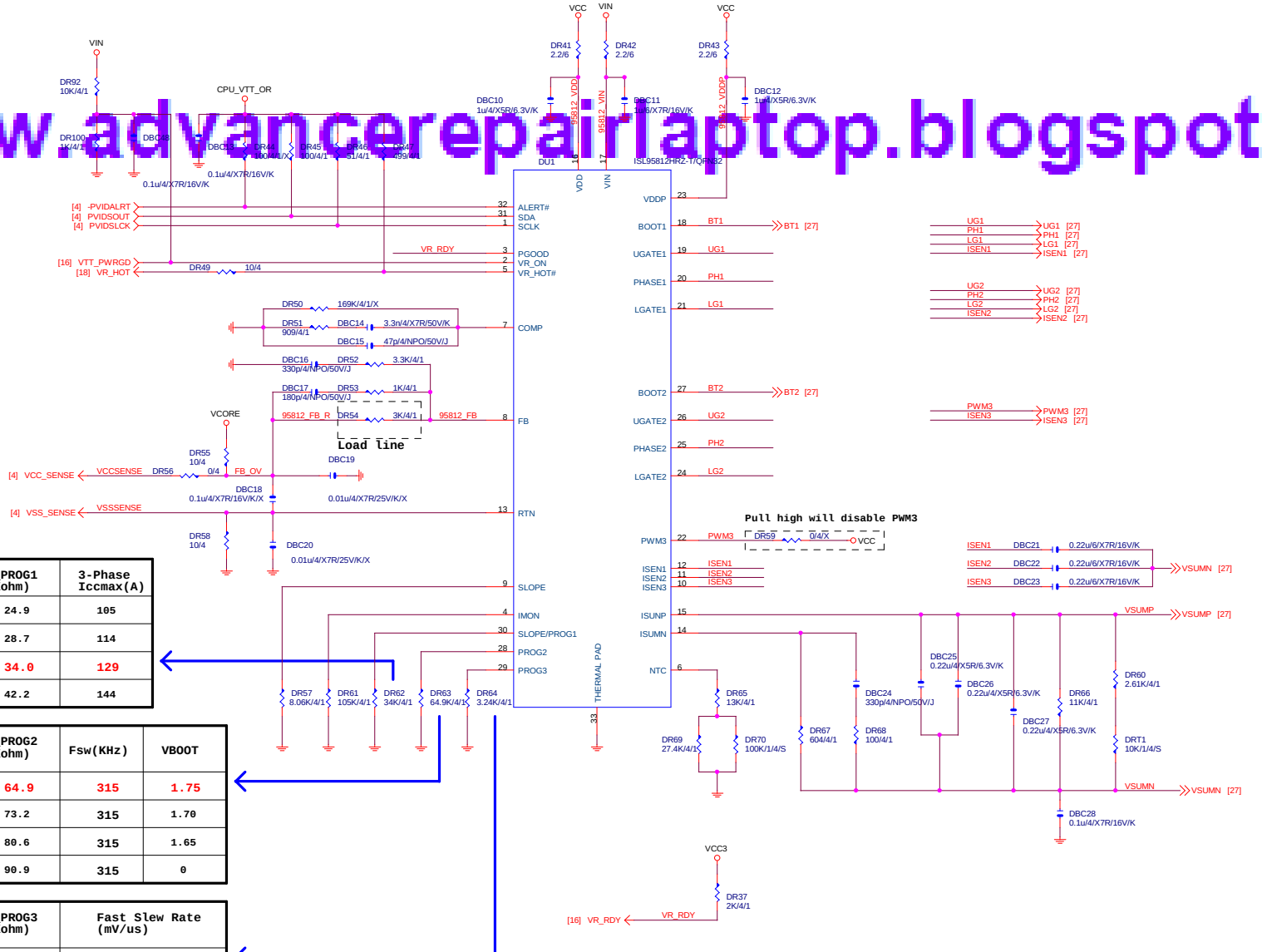




FIX PWR MINMUN LOAD

Gigabyte Technology

Title	ATX CONNECTOR	
Size: Custom	Document Number: GA-H81M-S1	Rev: 1.0
Date: Tuesday, July 09, 2013	Sheet 25 of 29	



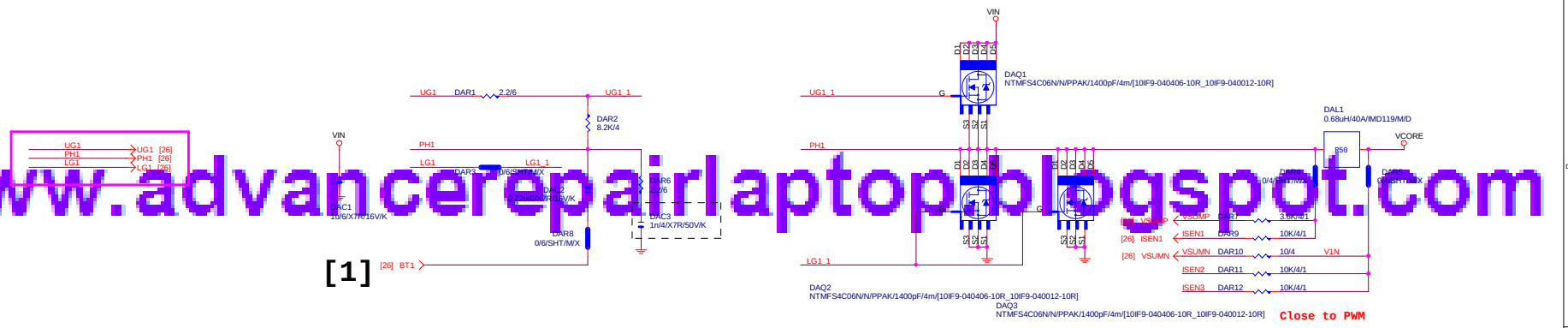
R_PROG1 (Kohm)	3-Phase Iccmax(A)
24.9	105
28.7	114
34.0	129
42.2	144

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

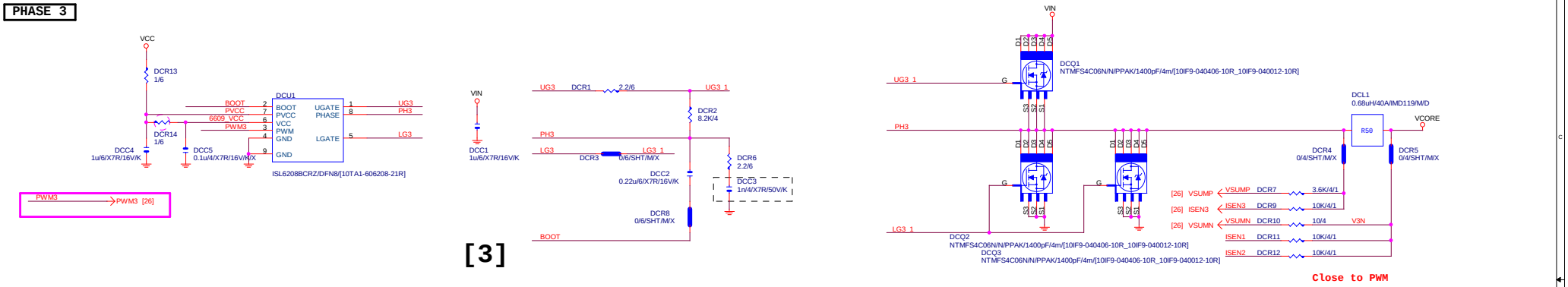
R_PROG3 (Kohm)	Fast Slew Rate (mV/us)
3.24	12
5.76	24
9.31	40
13.3	45

Gigabyte Technology			
Title: CPU CORE VR-1			
Size: Custom	Document Number: GA-H81M-S1		Rev: 1.0
Date: Tuesday, July 09, 2013		Sheet 26 of 29	

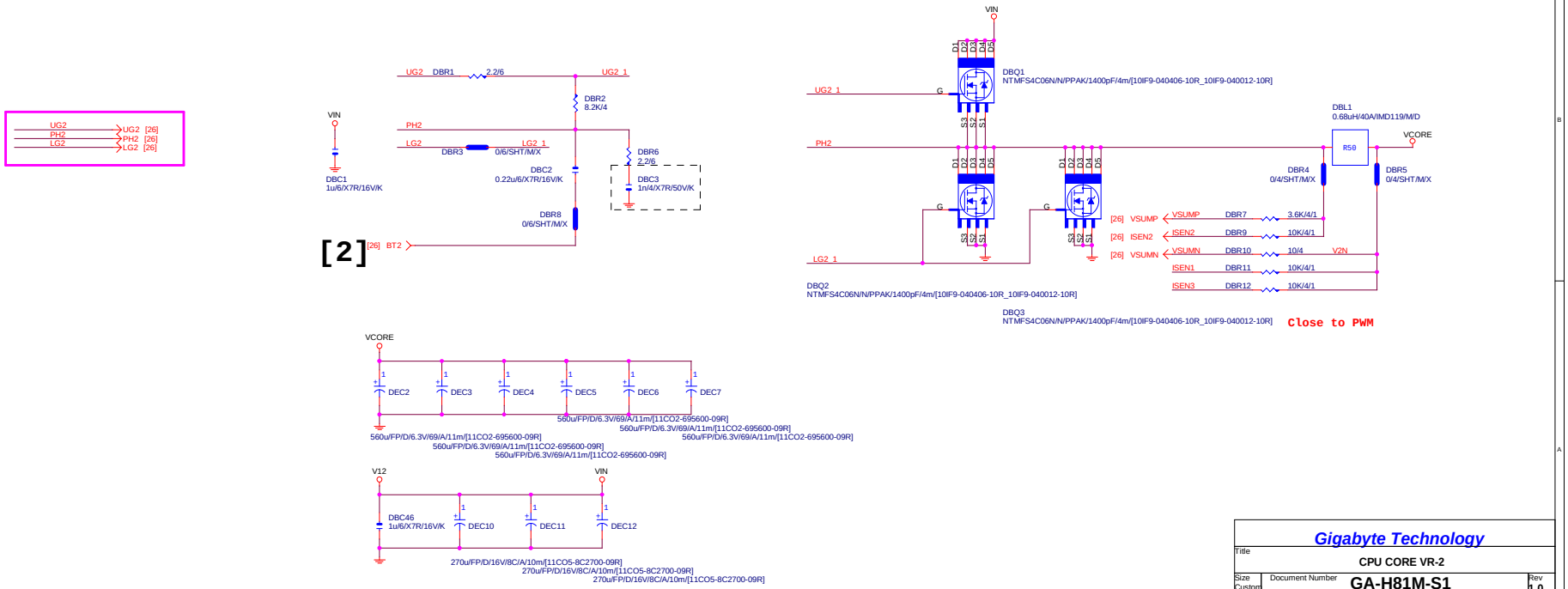
PHASE 1



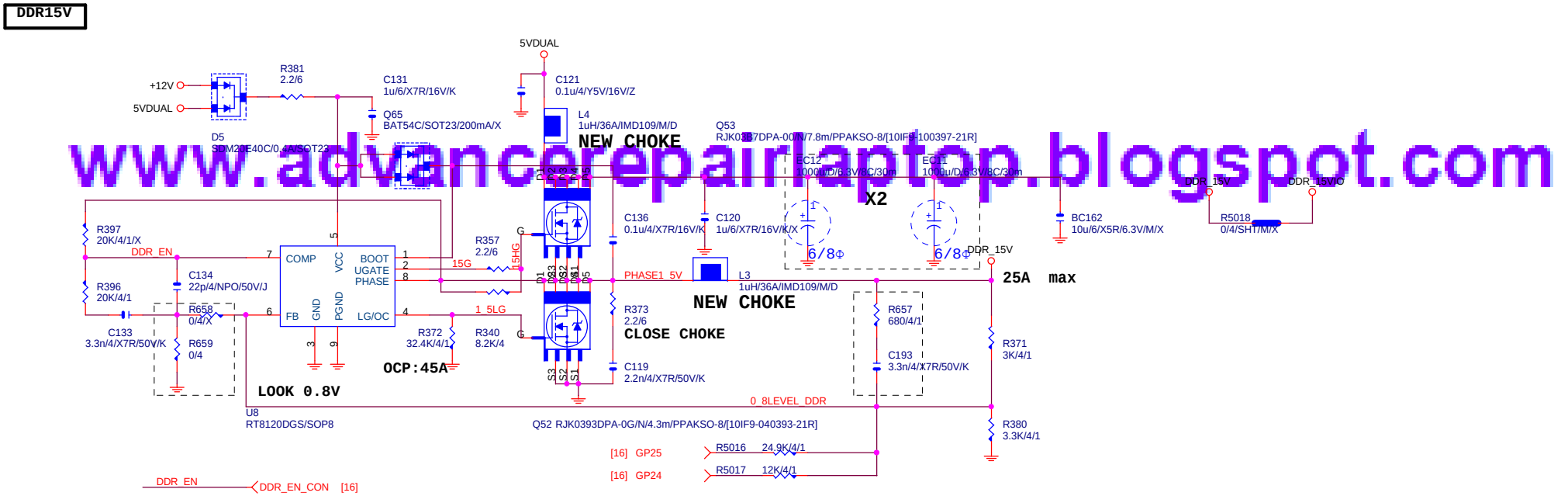
PHASE 3



PHASE 2



Gigabyte Technology			
Title	CPU CORE VR-2		
Size: Custom	Document Number: GA-H81M-S1		Rev: 1.0
Date: Tuesday, July 09, 2013	Sheet 27 of 29		



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

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

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

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

Gigabyte Technology			
Title: DDR POWER			
Size: Custom	Document Number: GA-H81M-S1		Rev: 1.0
Date: Tuesday, July 09, 2013	Sheet 28 of 29		