Model Name: GA-Z87M-HD3

Revision 1.1

SHEET	TITLE
01	COVER SHEET
02	BOM & PCB MODIFY HISTORY
03	BLOCK DIAGRAM
04	CPU_LGA1150-A
05	CPU_LGA1150-B
06	CPU_LGA1150-C
07	DDR III CHANNEL A
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	PCI SLOT
17	ITE 8728 LPC IO
18	COM,KB_MS_USB,USB30_20
19	HWM,FAN CTRL,OV,-PROCHOT
20	DUAL BIOS
21	FP,FUSB,SPK,SATALED
22	Realtek ALC887-VD2
23	REAR AUDIO JACK
24	REALTEK RTL8111F
25	DISCRETE POWER
26	ATX , CLOCK GEN
27	VCORE ISL95820_1

SHEET	TITLE
28	VCORE ISL95820_2
29	RT8120_DDR POWER
30	LPT, M3 POWER
31	DVI, HDMI
32	IT8892E

Gigabyte Technology

Title: Cover Sheet

Size: Custom | Document Number: GA-Z87M-HD3 | Rev: 1.1

Date: Tuesday, July 23, 2013 | Sheet 1 of 32

Model Name: GA-Z87M-HD3

Revision 1.1

Component value change history

2013/07/23

Data	Change Item	Reason
2013/01/08	Modify to R0.2	
	PCIEX1_2 CLK Change Port	
2013/01/14	ADD Disable SVID [SVID_CTRL]	
	ADD Disable ME [DS_ME]	
	ADD -PCIE_RST Patch	
2013/03/13	Modify 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	
2013/04/08	Update PROCHOT	PBOM: 9MZ87MHD3-00-10B
	R148: 35.7K -> 75K	
	R136: 1.4K -> 1.5K	
	DR149: 3.83K -> 13K	
2013/06/27	Update to Rev: 1.1	PBOM: 9MZ87MHD3-00-11A
	Chipset change REV: C2	
	Update HDMI Footprint "HDMI-3"	
2013/07/11	5VSB OVP Protection	PBOM: 9MZ87MHD3-00-11B
	DEL R704: 8.2K/4	
	ADD R706: 8.2K/4	
	R705: 715/4/1 -> 825/4/1	
	DEL AUDIO AZ2225-01L CD1	
2013/07/26	CPU FAN Color change to white	PBOM: 9MZ87MHD3-00-11C

Circuit or PCB layout change

DATE	Change Item	Reason

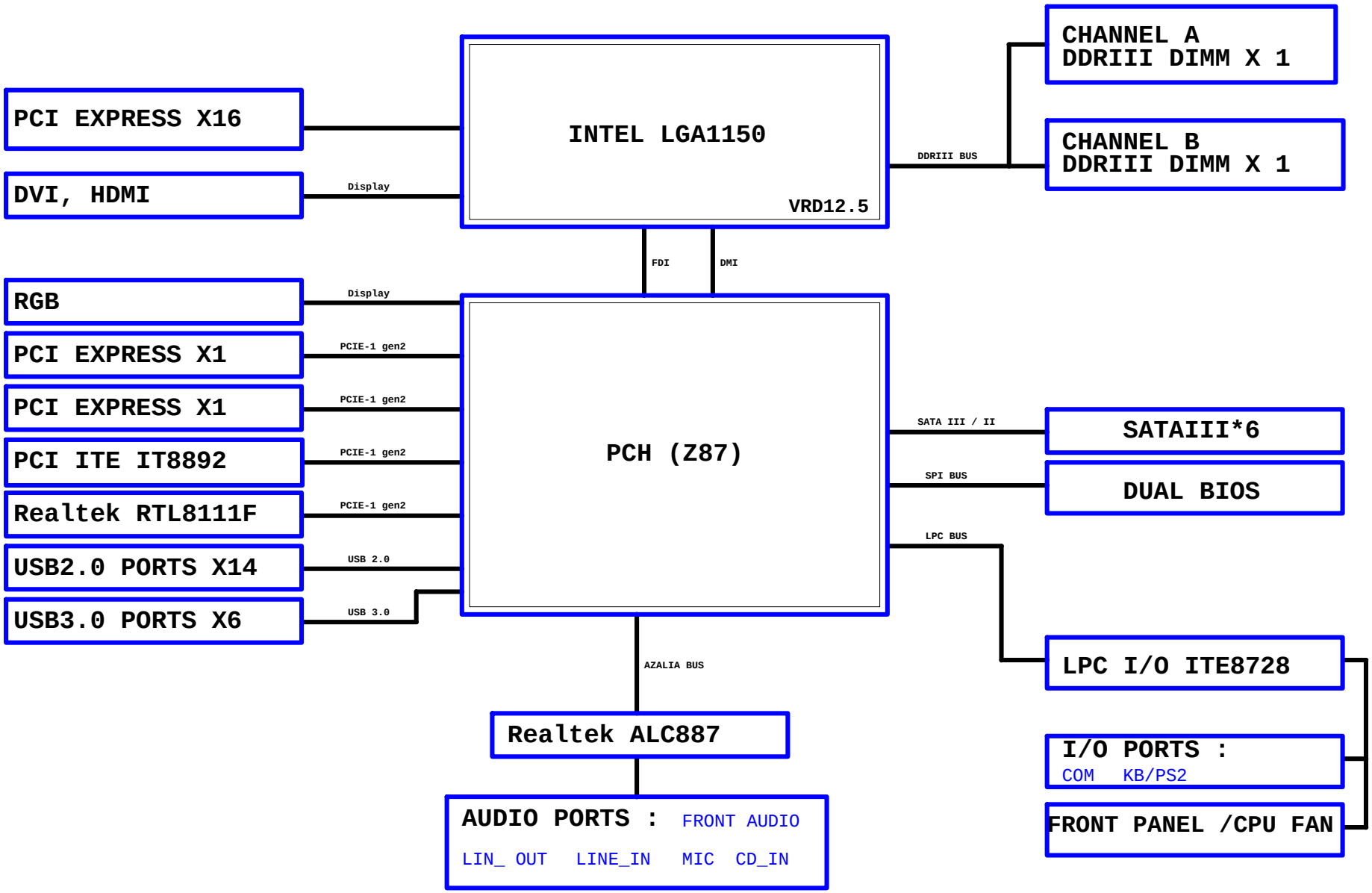
Gigabyte Technology

Title: BOM & PCB MODIFY HISTORY

Size: Custom | Document Number: GA-Z87M-HD3 | Rev: 1.1

Date: Tuesday, July 23, 2013 | Sheet 2 of 32

BLOCK DIAGRAM



Gigabyte Technology		
Title: BLOCK DIAGRAM		
Size: C	Document Number: GA-Z87M-HD3	Rev: 1.1
Date: Tuesday, July 23, 2013	Sheet 3 of 32	

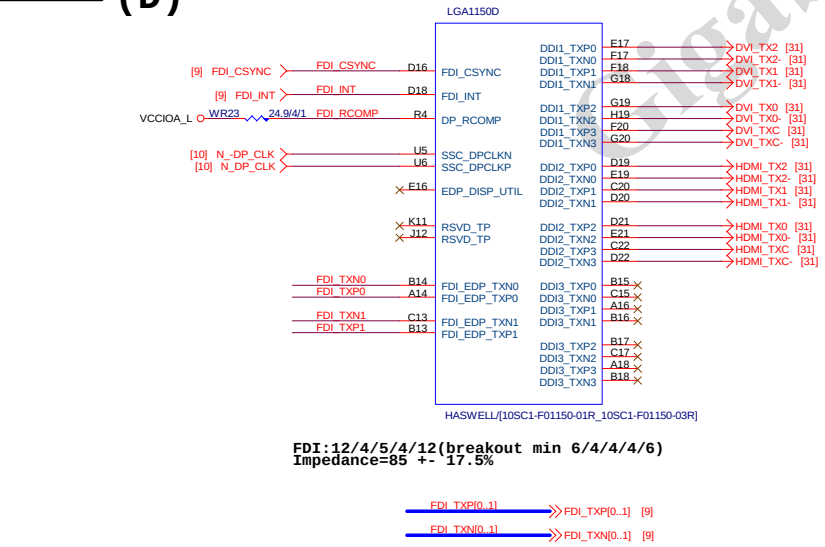
LGA1150 (E)

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

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

CFG 0-17 all internal PULL-UP

LGA1150 (D)



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

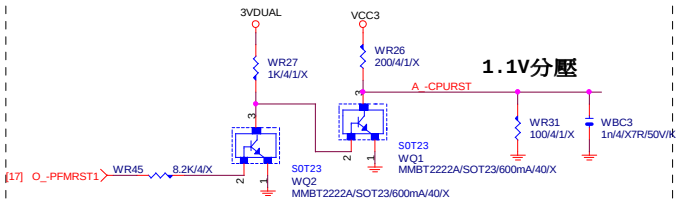
LGA1155 (C)

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

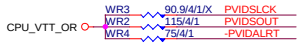
DMI:12/4/4/4/12(breakout min 8/4/4/4/8)
Impedance=85 +- 17.5%

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

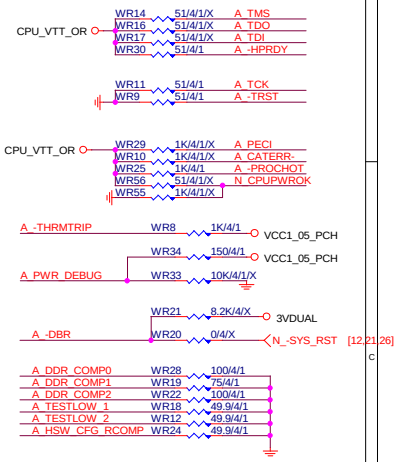
-CPURST



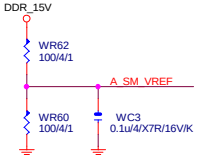
CPU SVID



CPU PU/PD



SM REF



Gigabyte Technology		
Title: CPU LGA1150-A		
Size: Custom	Document Number: GA-Z87M-HD3	Rev: 1.1
Date: Tuesday, July 23, 2013	Sheet 4 of 32	

LGA1150 (A)

LGA1150A

MAAA0	AU13	DDR0_MA0	DDR0_DQ0	AD38	MDA0
MAAA1	AV16	DDR0_MA1	DDR0_DQ1	AD39	MDA1
MAAA2	AU16	DDR0_MA2	DDR0_DQ2	AF38	MDA2
MAAA3	AW17	DDR0_MA3	DDR0_DQ3	AF39	MDA3
MAAA4	AU17	DDR0_MA4	DDR0_DQ4	AD37	MDA4
MAAA5	AW18	DDR0_MA5	DDR0_DQ5	AD40	MDA5
MAAA6	AV17	DDR0_MA6	DDR0_DQ6	AE37	MDA6
MAAA7	AT18	DDR0_MA7	DDR0_DQ7	AF40	MDA7
MAAA8	AU18	DDR0_MA8	DDR0_DQ8	AH40	MDA8
MAAA9	AT19	DDR0_MA9	DDR0_DQ9	AH39	MDA13
MAAA10	AW11	DDR0_MA10	DDR0_DQ10	AK38	MDA10
MAAA11	AV19	DDR0_MA11	DDR0_DQ11	AK39	MDA11
MAAA12	AU19	DDR0_MA12	DDR0_DQ12	AH37	MDA12
MAAA13	AY10	DDR0_MA13	DDR0_DQ13	AH38	MDA8
MAAA14	AT20	DDR0_MA14	DDR0_DQ14	AK37	MDA14
MAAA15	AU21	DDR0_MA15	DDR0_DQ15	AK40	MDA15
			DDR0_DQ16	AM40	MDA17
MODT_A0	AW10	DDR0_ODT0	DDR0_DQ17	AM39	MDA21
MODT_A1	AY8	DDR0_ODT1	DDR0_DQ18	AP38	MDA18
	AW9	DDR0_ODT2	DDR0_DQ19	AP39	MDA19
	AU8	DDR0_ODT3	DDR0_DQ20	AM37	MDA20
			DDR0_DQ21	AM38	MDA16
	AW33	DDR0_ECC0	DDR0_DQ22	AP37	MDA22
	AV33	DDR0_ECC1	DDR0_DQ23	AP40	MDA23
	AU31	DDR0_ECC2	DDR0_DQ24	AV37	MDA25
	AV31	DDR0_ECC3	DDR0_DQ25	AW37	MDA29
	AT33	DDR0_ECC4	DDR0_DQ26	AU35	MDA26
	AU33	DDR0_ECC5	DDR0_DQ27	AV35	MDA27
	AT31	DDR0_ECC6	DDR0_DQ28	AT37	MDA28
	AW31	DDR0_ECC7	DDR0_DQ29	AU37	MDA24
			DDR0_DQ30	AT35	MDA30
			DDR0_DQ31	AW35	MDA31
SBAA0	AV12	DDR0_BA0	DDR0_DQ32	AY6	MDA33
SBAA1	AY11	DDR0_BA1	DDR0_DQ33	AU6	MDA37
SBAA2	AT21	DDR0_BA2	DDR0_DQ34	AV4	MDA34
			DDR0_DQ35	AU4	MDA35
CKEA0	AV22	DDR0_CKE0	DDR0_DQ36	AW6	MDA36
CKEA1	AT23	DDR0_CKE1	DDR0_DQ37	AV6	MDA32
	AV22	DDR0_CKE2	DDR0_DQ38	AW4	MDA38
	AU23	DDR0_CKE3	DDR0_DQ39	AY4	MDA39
			DDR0_DQ40	AR1	MDA41
-CSA0	AU14	DDR0_CS_N0	DDR0_DQ41	AR4	MDA45
-CSA1	AV9	DDR0_CS_N1	DDR0_DQ42	AN3	MDA42
	AU10	DDR0_CS_N2	DDR0_DQ43	AN4	MDA43
	AW8	DDR0_CS_N3	DDR0_DQ44	AR2	MDA44
			DDR0_DQ45	AR3	MDA40
DCLKA0	AY15	DDR0_CLK_P0	DDR0_DQ46	AN2	MDA46
-DCLKA0	AY16	DDR0_CLK_N0	DDR0_DQ47	AN1	MDA47
DCLKA1	AW15	DDR0_CLK_P1	DDR0_DQ48	AL1	MDA49
-DCLKA1	AV15	DDR0_CLK_N1	DDR0_DQ49	AL4	MDA53
	AY14	DDR0_CLK_P2	DDR0_DQ50	AJ3	MDA50
	AW14	DDR0_CLK_N2	DDR0_DQ51	AJ4	MDA51
	AW13	DDR0_CLK_P3	DDR0_DQ52	AL2	MDA52
	AY13	DDR0_CLK_N3	DDR0_DQ53	AL3	MDA48
			DDR0_DQ54	AJ2	MDA54
	AW12	RSVD	DDR0_DQ55	AJ1	MDA55
			DDR0_DQ56	AG1	MDA57
			DDR0_DQ57	AG4	MDA61
			DDR0_DQ58	AE3	MDA58
			DDR0_DQ59	AE4	MDA59
			DDR0_DQ60	AG2	MDA60
			DDR0_DQ61	AG3	MDA56
			DDR0_DQ62	AE2	MDA62
SRASA	AU12	DDR0_RAS*	DDR0_DQ63	AE1	MDA63
SWEA	AU11	DDR0_WE*	DDR0_DQS_P0	AE39	DQSA0
	AV20	RSVD	DDR0_DQS_P1	AJ39	DQSA1
	AW27	RSVD	DDR0_DQS_P2	AN39	DQSA2
			DDR0_DQS_P3	AV36	DQSA3
SCASA	AU9	DDR0_CAS*	DDR0_DQS_P4	AV5	DQSA4
			DDR0_DQS_P5	AP3	DQSA5
			DDR0_DQS_P6	AK3	DQSA6
			DDR0_DQS_P7	AE3	DQSA7
			DDR0_DQS_P8	AV32	
DDR3_RST	AK22	DDR_RESET*	DDR0_DQS_N0	AE38	-DQSA0
			DDR0_DQS_N1	AJ38	-DQSA1
			DDR0_DQS_N2	AN38	-DQSA2
			DDR0_DQS_N3	AU36	-DQSA3
			DDR0_DQS_N4	AW5	-DQSA4
			DDR0_DQS_N5	AP2	-DQSA5
			DDR0_DQS_N6	AK2	-DQSA6
			DDR0_DQS_N7	AF2	-DQSA7
			DDR0_DQS_N8	AU32	

WR61 0/4/SHT/MIX

WC4 0.1u/4/X7R/16V/K/X

HASWELL/[10SC1-F01150-01R_10SC1-F01150-03R]

LGA1150 (B)

LGA1150B

MAAB0	AL19	DDR1_MA0	DDR1_DQ0	AE34	MDB0
MAAB1	AK23	DDR1_MA1	DDR1_DQ1	AE35	MDB1
MAAB2	AM22	DDR1_MA2	DDR1_DQ2	AG35	MDB2
MAAB3	AM23	DDR1_MA3	DDR1_DQ3	AH35	MDB3
MAAB4	AP23	DDR1_MA4	DDR1_DQ4	AD34	MDB4
MAAB5	AL23	DDR1_MA5	DDR1_DQ5	AD35	MDB5
MAAB6	AY24	DDR1_MA6	DDR1_DQ6	AG34	MDB6
MAAB7	AV25	DDR1_MA7	DDR1_DQ7	AH34	MDB7
MAAB8	AU26	DDR1_MA8	DDR1_DQ8	AL34	MDB8
MAAB9	AW25	DDR1_MA9	DDR1_DQ9	AL35	MDB9
MAAB10	AP18	DDR1_MA10	DDR1_DQ10	AK31	MDB10
MAAB11	AY25	DDR1_MA11	DDR1_DQ11	AL31	MDB11
MAAB12	AV26	DDR1_MA12	DDR1_DQ12	AK34	MDB12
MAAB13	AR15	DDR1_MA13	DDR1_DQ13	AK35	MDB13
MAAB14	AV27	DDR1_MA14	DDR1_DQ14	AK32	MDB14
MAAB15	AY28	DDR1_MA15	DDR1_DQ15	AL32	MDB15
			DDR1_DQ16	AN34	MDB17
MODT_B0	AM17	DDR1_ODT0	DDR1_DQ17	AP34	MDB21
MODT_B1	AL16	DDR1_ODT1	DDR1_DQ18	AN31	MDB19
	AM16	DDR1_ODT2	DDR1_DQ19	AP31	MDB23
	AK15	DDR1_ODT3	DDR1_DQ20	AN35	MDB20
			DDR1_DQ21	AP35	MDB16
	AM26	DDR1_ECC0	DDR1_DQ22	AN32	MDB18
	AM25	DDR1_ECC1	DDR1_DQ23	AP32	MDB22
	AP25	DDR1_ECC2	DDR1_DQ24	AM29	MDB25
	AP26	DDR1_ECC3	DDR1_DQ25	AM28	MDB28
	AL26	DDR1_ECC4	DDR1_DQ26	AR29	MDB27
	AL25	DDR1_ECC5	DDR1_DQ27	AR28	MDB30
	AR26	DDR1_ECC6	DDR1_DQ28	AL29	MDB24
	AR25	DDR1_ECC7	DDR1_DQ29	AL28	MDB29
			DDR1_DQ30	AP29	MDB26
SBAB0	AK17	DDR1_BA0	DDR1_DQ31	AP28	MDB31
SBAB1	AL18	DDR1_BA1	DDR1_DQ32	AR12	MDB32
SBAB2	AW28	DDR1_BA2	DDR1_DQ33	AP12	MDB33
			DDR1_DQ34	AL13	MDB34
CKEB0	AW29	DDR1_CKE0	DDR1_DQ35	AL12	MDB35
CKEB1	AY29	DDR1_CKE1	DDR1_DQ36	AR13	MDB36
	AU28	DDR1_CKE2	DDR1_DQ37	AP13	MDB37
	AU29	DDR1_CKE3	DDR1_DQ38	AM13	MDB38
			DDR1_DQ39	AM12	MDB39
-CSB0	AP17	DDR1_CS_N0	DDR1_DQ40	AR9	MDB45
-CSB1	AN15	DDR1_CS_N1	DDR1_DQ41	AP9	MDB41
	AN17	DDR1_CS_N2	DDR1_DQ42	AR6	MDB47
	AL15	DDR1_CS_N3	DDR1_DQ43	AP6	MDB43
			DDR1_DQ44	AR10	MDB44
			DDR1_DQ45	AP10	MDB40
			DDR1_DQ46	AR7	MDB46
			DDR1_DQ47	AP7	MDB42
DCLKB0	AM20	DDR1_CLK_P0	DDR1_DQ48	AM9	MDB52
-DCLKB0	AM21	DDR1_CLK_N0	DDR1_DQ49	AL9	MDB53
DCLKB1	AP22	DDR1_CLK_P1	DDR1_DQ50	AL6	MDB50
-DCLKB1	AP21	DDR1_CLK_N1	DDR1_DQ51	AL7	MDB55
			DDR1_DQ52	AM10	MDB48
	AN20	DDR1_CLK_P2	DDR1_DQ53	AL10	MDB49
	AN21	DDR1_CLK_N2	DDR1_DQ54	AM6	MDB54
	AP19	DDR1_CLK_P3	DDR1_DQ55	AM7	MDB51
	AP20	DDR1_CLK_N3	DDR1_DQ56	AH6	MDB61
			DDR1_DQ57	AH7	MDB60
SCASB	AP16	DDR1_CAS*	DDR1_DQ58	AE6	MDB59
	AL20	RSVD	DDR1_DQ59	AE7	MDB63
SRASB	AM18	DDR1_RAS*	DDR1_DQ60	AJ6	MDB56
SWEB	AK16	DDR1_WE*	DDR1_DQ61	AJ7	MDB57
			DDR1_DQ62	AF6	MDB58
VREF_DQA	AB39	DDR_VREF_DQ0	DDR1_DQ63	AF7	MDB62
VREF_DQB	AB40	DDR_VREF_DQ1	DDR1_DQS_P0	AE35	DQSB0
			DDR1_DQS_P1	AL33	DQSB1
			DDR1_DQS_P2	AP33	DQSB2
			DDR1_DQS_P3	AN28	DQSB3
			DDR1_DQS_P4	AN12	DQSB4
			DDR1_DQS_P5	AP8	DQSB5
			DDR1_DQS_P6	AL8	DQSB6
			DDR1_DQS_P7	AG7	DQSB7
			DDR1_DQS_P8	AN25	
			DDR1_DQS_N0	AE34	-DQSB0
			DDR1_DQS_N1	AK33	-DQSB1
			DDR1_DQS_N2	AN33	-DQSB2
			DDR1_DQS_N3	AN29	-DQSB3
			DDR1_DQS_N4	AN13	-DQSB4
			DDR1_DQS_N5	AR8	-DQSB5
			DDR1_DQS_N6	AM8	-DQSB6
			DDR1_DQS_N7	AG6	-DQSB7
			DDR1_DQS_N8	AN26	

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

HASWELL/[10SC1-F01150-01R_10SC1-F01150-03R]

LGA1150 (CR)

CR
CPU RETAINTION/X

LGA1150_P

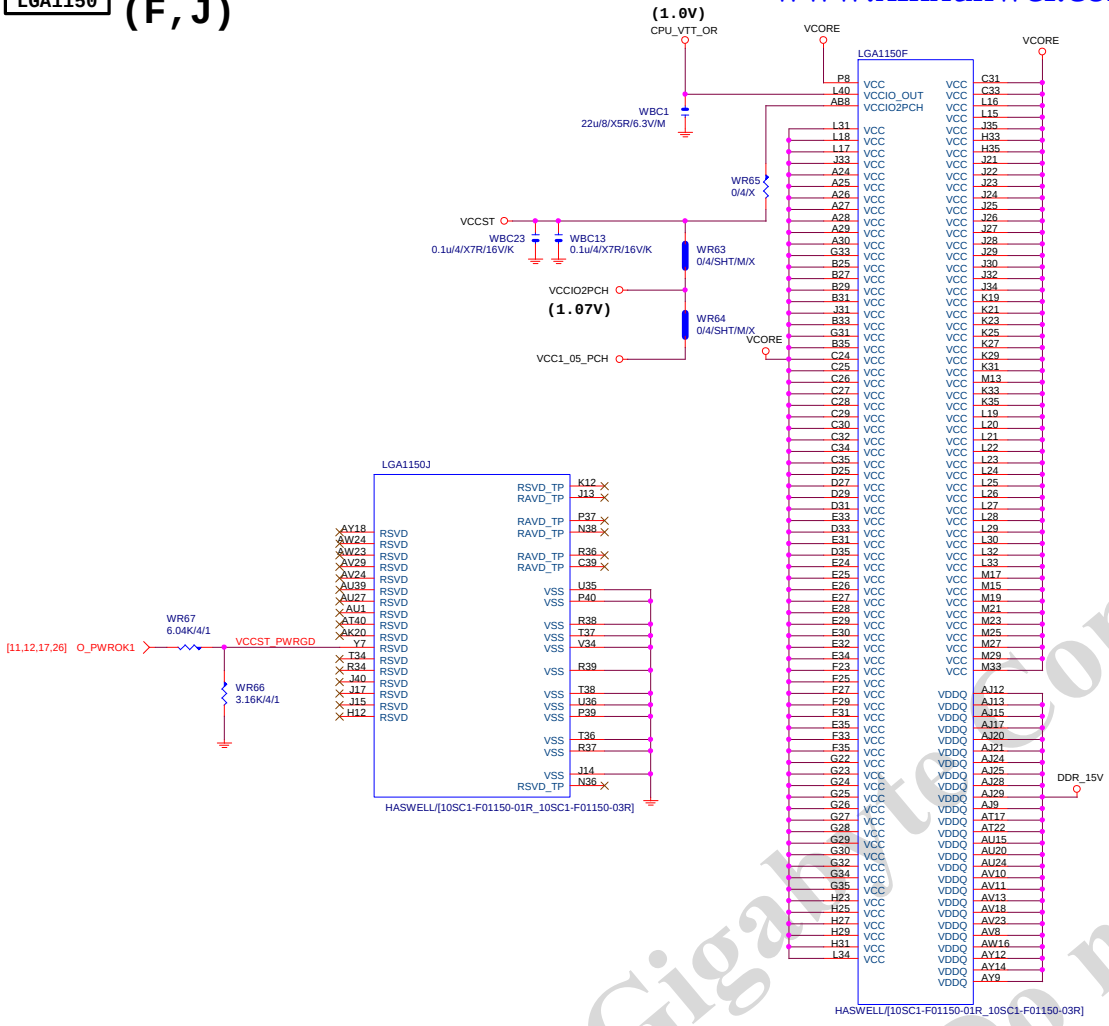
ILM_BP/1156/CSP/ILM_BP/1156/CSP/[12KRC-0F0001-52R_12KRC-0F0001-51R]

DDR BUS

[7] MODT_A[0..1] — MODT_A[0..1]
[8] MODT_B[0..1] — MODT_B[0..1]
[7] MDA[0..63] — MDA[0..63]
[8] MDB[0..63] — MDB[0..63]
[7] DQSA[0..7] — DQSA[0..7]
[7] -DQSA[0..7] — -DQSA[0..7]
[7] MAAA[0..15] — MAAA[0..15]
[8] MAAB[0..15] — MAAB[0..15]
[8] DQSB[0..7] — DQSB[0..7]
[8] -DQSB[0..7] — -DQSB[0..7]

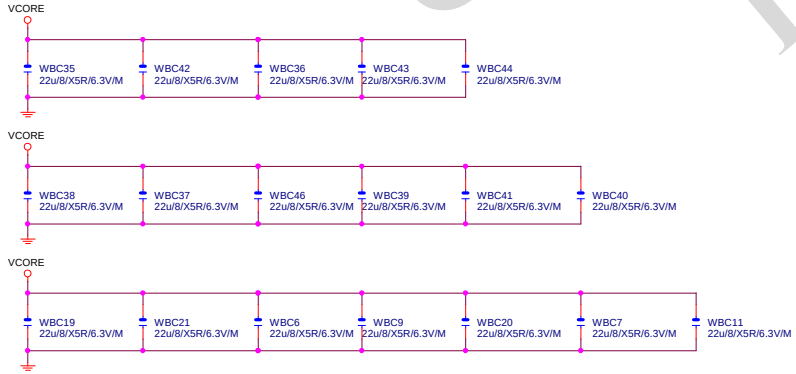
Gigabyte Technology		
Title: CPU LGA1150-B		
Size: Custom	Document Number: GA-Z87M-HD3	Rev: 1.1
Date: Tuesday, July 23, 2013	Sheet 5 of 32	

LGA1150 (F,J)

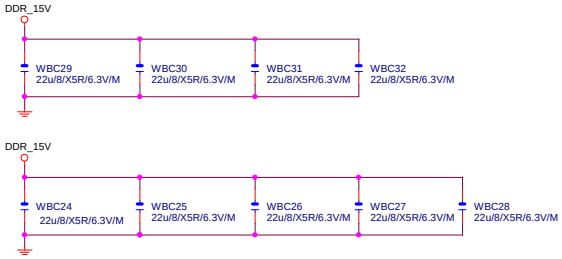


LGA1155 (G,H,I)

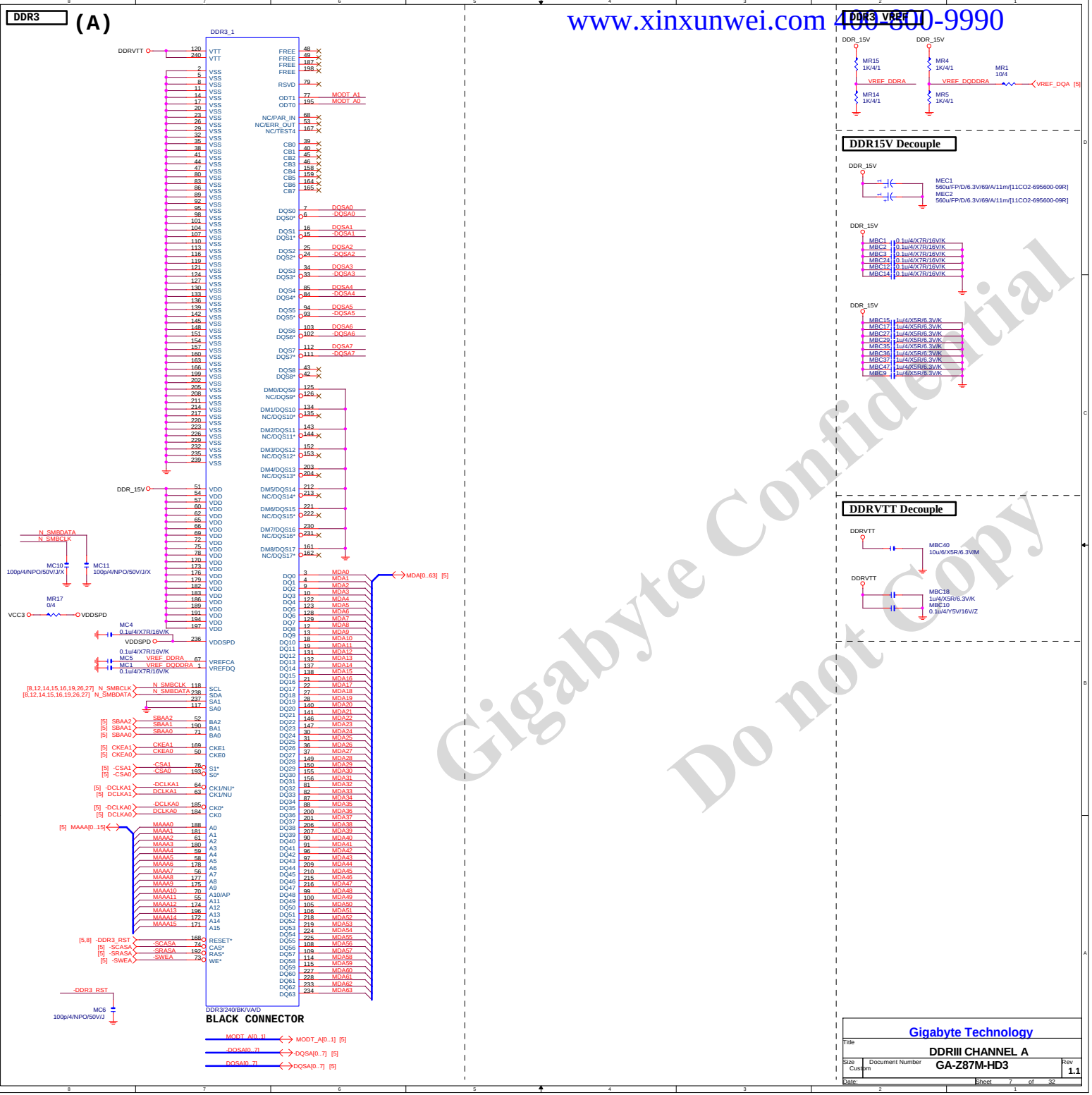
VCore CAP (X18)



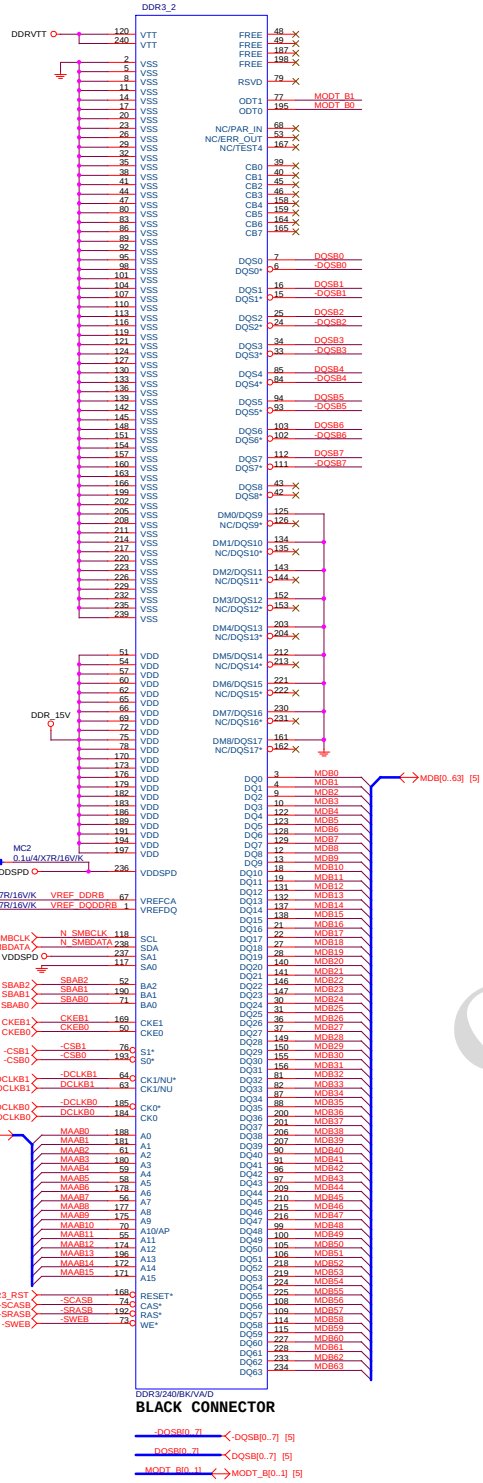
DDR CAP (X9)

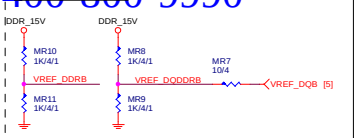


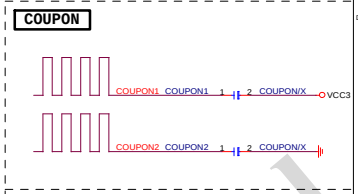
Gigabyte Technology		
Title: CPU LGA1150-C		
Size: Custom	Document Number: GA-Z87M-HD3	Rev: 1.1
Date: Tuesday, July 23, 2013	Sheet 6 of 32	

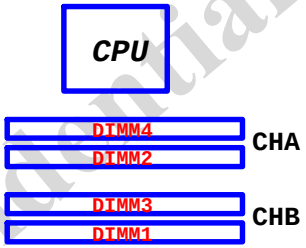


DDR3 (B)









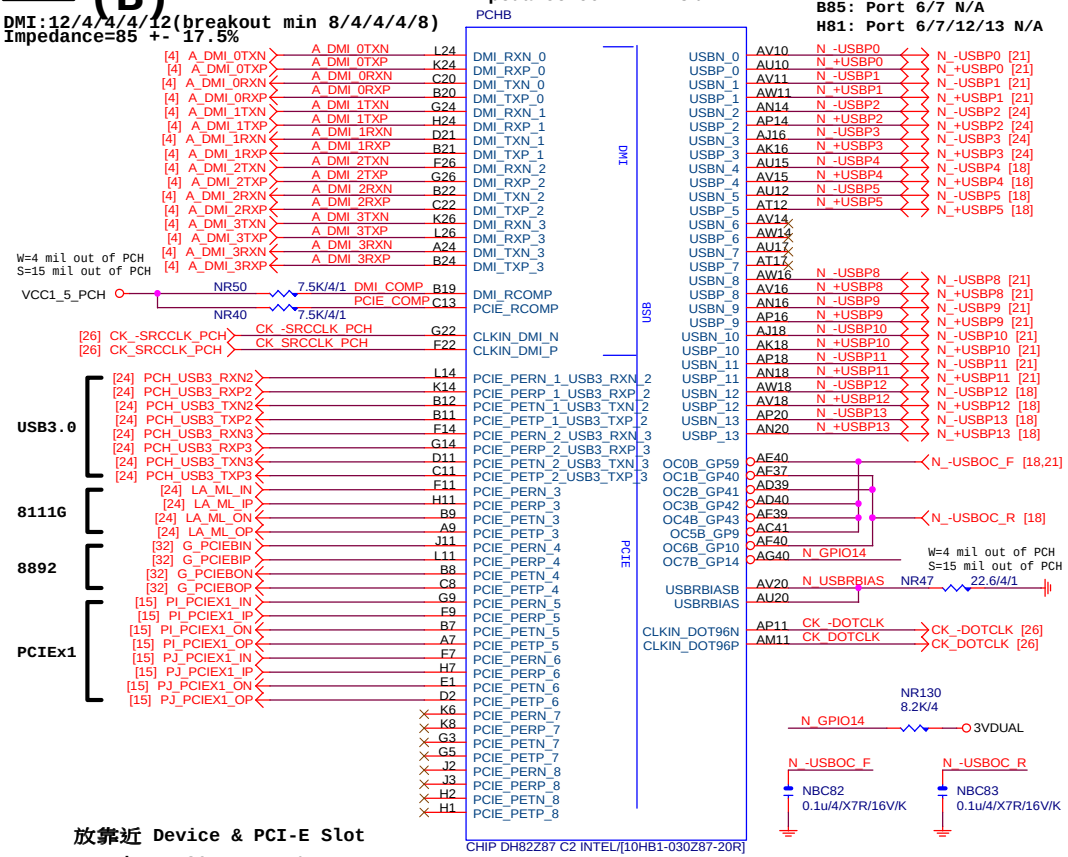
Gigabyte Technology			
Title: DDRIII CHANNEL B			
Size: Custom	Document Number: GA-Z87M-HD3		Rev: 1.1
Date:	Sheet 8 of 32		

PCH (B)

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

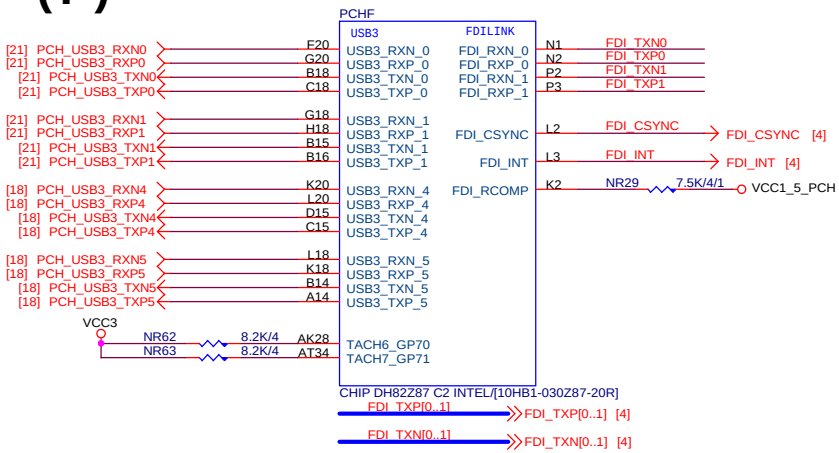
USB2.0 : 12/4.5/7.5/4.5/12 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%

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



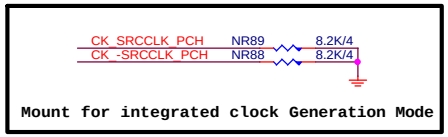
放靠近 Device & PCI-E Slot
Impedance=80 +- 17.5%
PCIEX1:16/5/5/5/16 (breakout min 8/4/4/4/8)

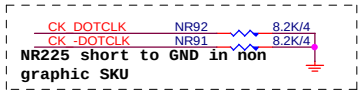
PCH (F)



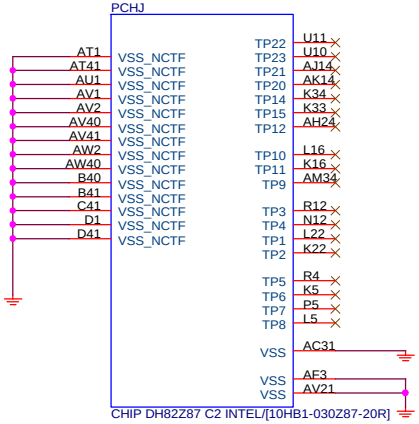
USB3.0:20/5/7/5/20 (breakout min 8/4/4/4/8) ; ONLY 3 VIAS
Impedance=85 +- 17.5%
Back Panel < 10000 MILS
Front Panel < 6000 MILS

PCH CLK PD



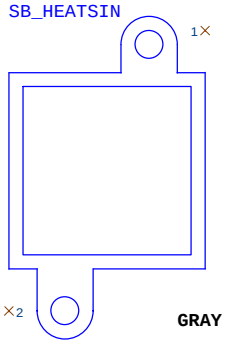


PCH (J)



PCH H/S

LOW COST ICH7 HEATSINK



PCH_HS
PCH_HS/[12SP2-030005-43R_12SP2-030005-41R_12SP2-030005-42R]

USB TABLE

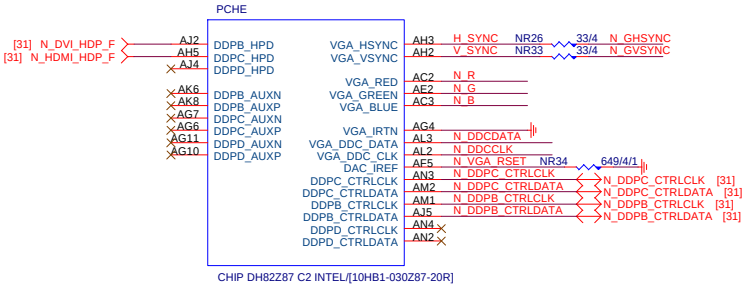
OC[3:0]# for Device 29 (ports 0-7)
OC[7:4]# for Device 26 (ports 8-13)

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

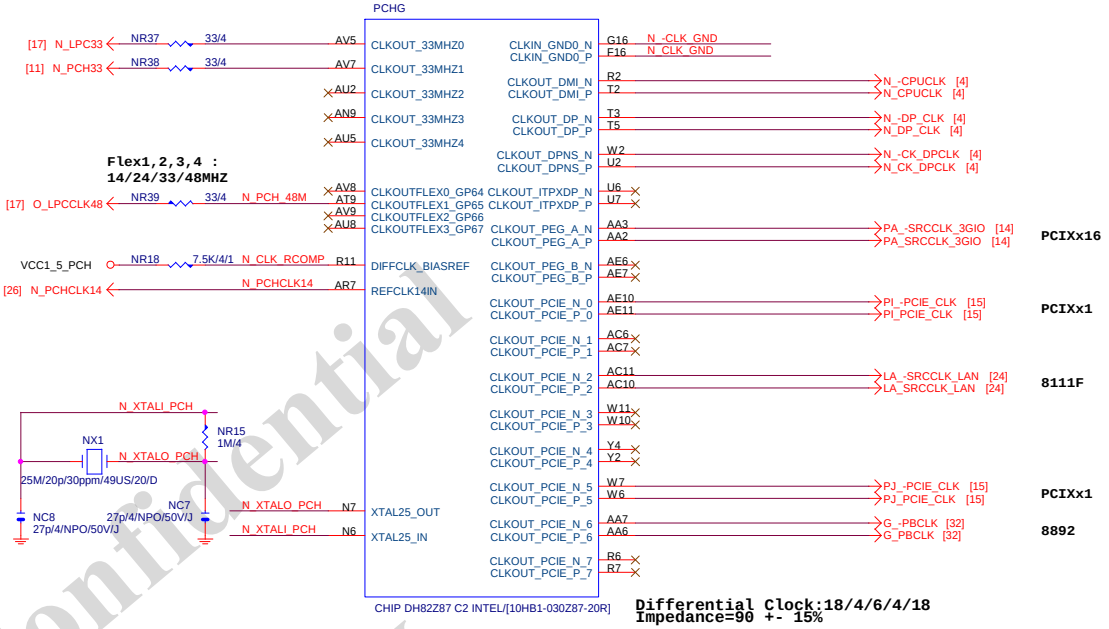
Gigabyte Technology

Title	PCH FDI,DMI,USB ,PCIE,NVRAM	
Size: Custom	Document Number: GA-Z87M-HD3	Rev: 1.1
Date: Tuesday, July 23, 2013	Sheet 9 of 32	

PCH (E)

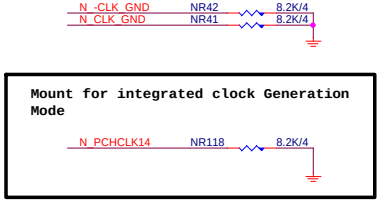


PCH (G)

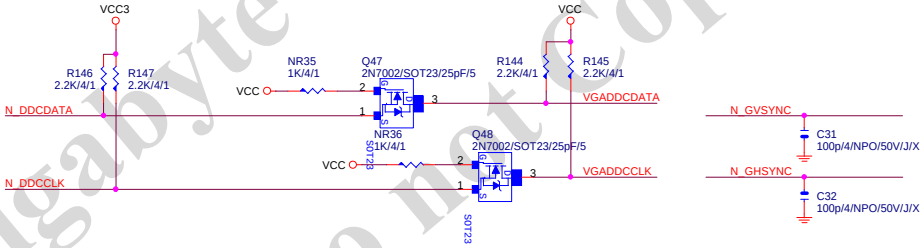


Differential Clock:18/4/6/4/18
Impedance=90 +- 15%

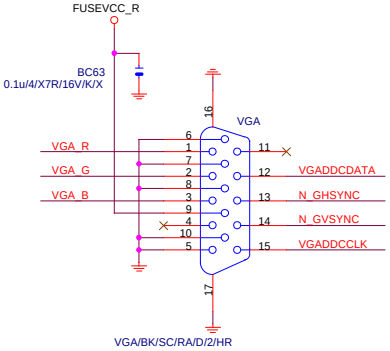
PCH CLK PD



VGA DDC

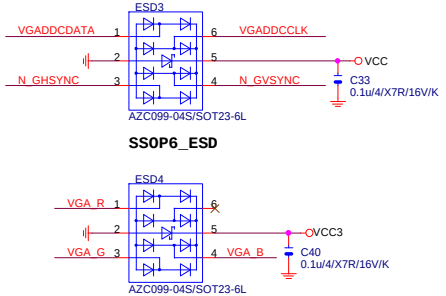


VGA CONNECTOR

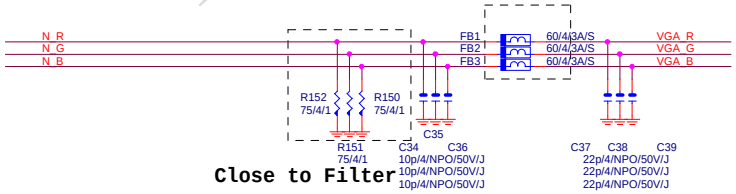


BLACK CONNECTOR

VGA ESD



VGA DDC

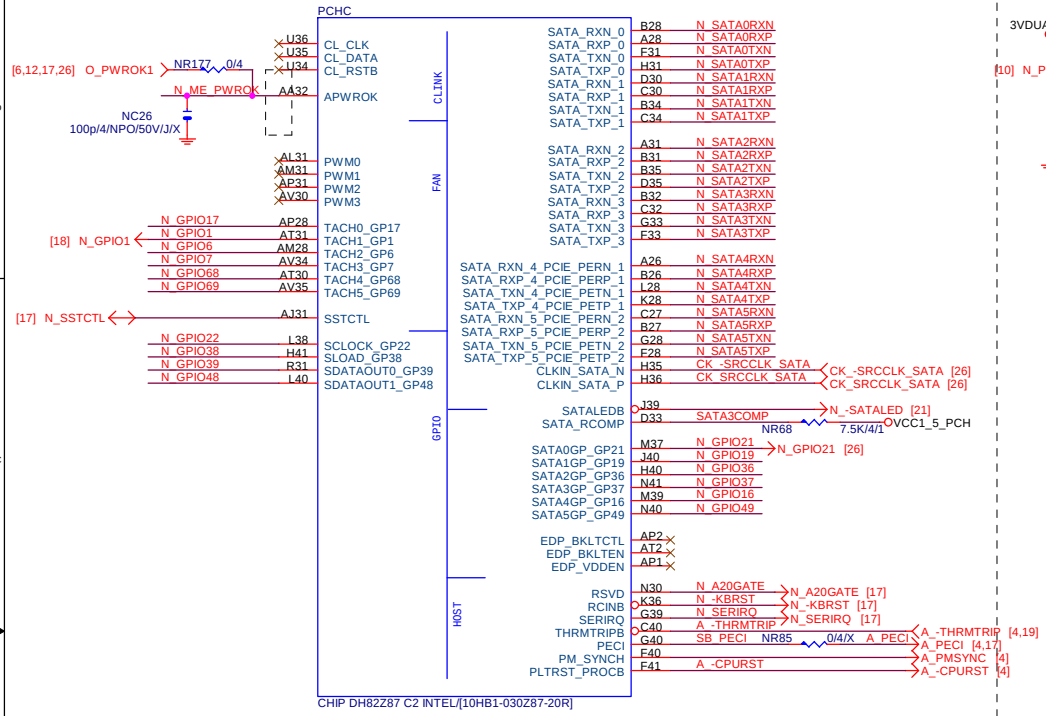


Close to Filter

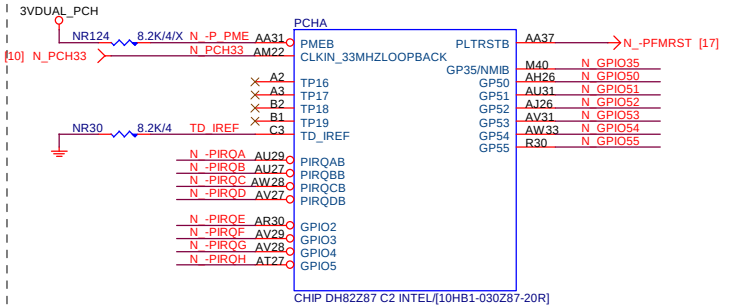
Gigabyte Technology		
Title	PCH DISPLAY ,CLK BUFFER	
Size: Custom	Document Number: GA-Z87M-HD3	Rev: 1.1
Date: Tuesday, July 23, 2013	Sheet 10 of 32	

PCH (C)

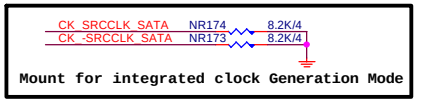
SATA3 : 20/7.5/4.5/7.5/20 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%
SATA2 : 15/7.5/4.5/7.5/15 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%



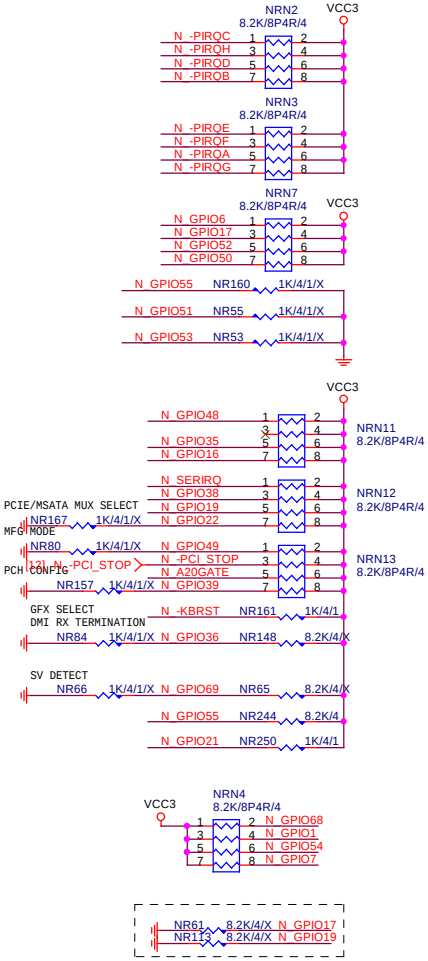
PCH (A)



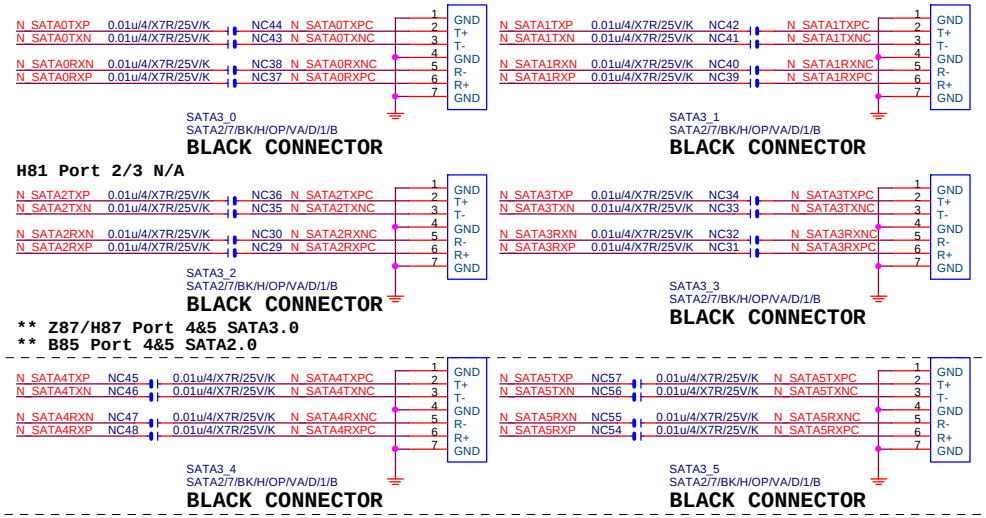
PCH CLK PD



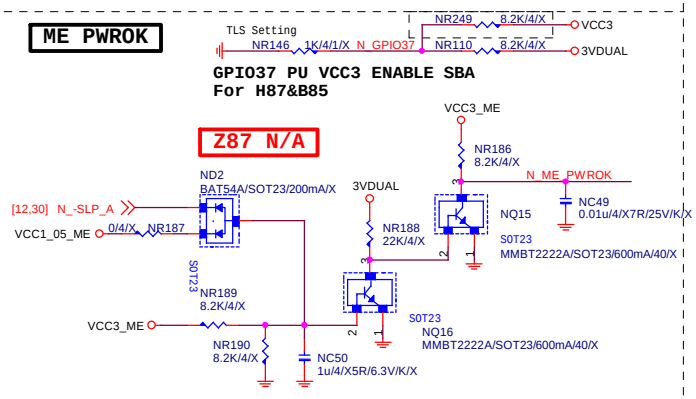
PCH PU/PD



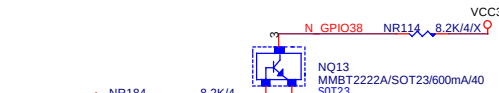
SATA CONNECTOR



ME PWROK



GPIO38 Ctrl



Title	PCH HOST , SATA, PCI
Size	Custom
Document Number	GA-Z87M-HD3
Rev	1.1
Date:	Tuesday, July 23, 2013
Sheet	11 of 32

Gigabyte Technology

PCH (D)

[17] N_LAD[0..3] ← N_LAD[0..3]

PCHD

VCC3 NR54 8.2K/4/X N_GPIO23 AK26
[17] N_LAD0 N_LAD0 AN24
[17] N_LAD1 N_LAD1 AP26
[17] N_LAD2 N_LAD2 AJ24
[17] N_LAD3 N_LAD3 AN26
[17] N_-LDRQ0 N_-LDRQ0 AK22
[17] N_-LFRAME N_-LFRAME AP24

[22] C_ACZ_BITCLK NR45 33/4 AV23
[22] C_-ACZ_RST NR43 33/4 AU24
AT26
AV22
[22] C_ACZ_SDIN2 AT22
AW23
[22] C_ACZ_SDOUT NR44 33/4 A_SO AU22
[22] C_ACZ_SYNC NR46 33/4 A_SYC AV24

[20] N_ICH_SPI_MOSI P40
[20] N_ICH_SPI_MISO R36
[20] N_-ICH_SPI_CS R38
[20] N_ICH_SPI_CLK U39
R35
R40
[20] SPI_DQ2 U40
[20] SPI_DQ3 U37

N_Y1 AN40
N_Y2 AN39
N_-RTCRST AR38
N_-SRTCRST AR39
N_-INTRUDER AR41
[6,11,17,26] O_PWROK1 AT40
[17,25] O_-RSMRST AM40
N_INTVRMEN AV36
N_PCH_DPWROK AV38
N_DSWVRMEN AM41

[17] N_-LPCPME N_-LPCPME AG31
[7,8,14,15,16,19,26,27] N_SMBCLK N_SMBCLK AG36
[7,8,14,15,16,19,26,27] N_SMBDATA N_SMBDATA AG32
[11] N_GPIO60 N_GPIO60 AG35
N_SMLOCLK AE32
N_SML0DAT AE35
[19] N_-PCH_HOT N_-PCH_HOT AJ39
N_SML1CLK AK36
N_SML1DAT AK33

LDRQ1B_GP23
LAD_0
LAD_1
LAD_2
LAD_3
LDRQ0B
LFRAMEB
HDA_BCLK
HDA_RSTB
HDA_SDI0
HDA_SDI1
HDA_SDI2
HDA_SDI3
HDA_SDO
HDA_SYNC
SPI_MOSI_IO0
SPI_MISO_IO1
SPI_CS0B
SPI_CLK
SPI_CS1B
SPI_CS2B
SPI_IO2
SPI_IO3
RTCX1
RTCX2
RTESTB
SRTCRSTB
INTRUDERB
PCH_PWROK
RSMRSTB
INTVRMEN
DPWROK
DSWODVREN
SMBALERTB_GP11
SMBCLK
SMBDATA
SML0ALERTB_GP60
SML0CLK
SML0DATA
SML1ALERTB_PCHHOTB_GP74
SML1CLK_GP58_MGPIO11
SML1DATA_GP75_MGPIO12

BMBUSYB_GP0 G38 N_GPIO0
CLKRUNB_GP32 N32 N_GPIO32
DOCKENB_GP33 AV26 N_GPIO33
STPPCIB_GP34 N34 N_-PCI_STOP → N_-PCI_STOP [11]
GP8 AC40 N_-IGC_EN
LAN_PHY_PWR_CTRL_GP12 AL40
HDA_DOCK_RSTB_GP13 AN22 -D_GPIO_HRST → -D_GPIO_HRST [14]
GP15 AC32 N_TEMP_ALARM → N_TEMP_ALART- [17]
GP24 AE34 A_-SKTOCC → A_-SKTOCC [4]
GP28 V41 N_GPIO28
SLP_WLANB_GP29 AL39 N_GPIO29
PCIECLKRQ0B_GP73 W34 N_GPIO73
PCIECLKRQ1B_GP18 P39 N_GPIO18
PCIECLKRQ2B_GP20_SMIB P37 N_GPIO20
PCIECLKRQ3B_GP25 AA39 N_GPIO25
PCIECLKRQ4B_GP26 W35 N_GPIO26
PCIECLKRQ5B_GP44 AA36 N_GPIO44
PCIECLKRQ6B_GP45 W32 N_GPIO45
PCIECLKRQ7B_GP46 AA40 N_GPIO46
GP57 AC36 N_GPIO57
SYS_PWROK W31 → N_PCH_VRMPWRGD [27]
RIB AE36 → N_-RI [18]
WAKEB AK34 → N_-PCIE_WAKE [14,15,24,32]
SLP_AB AN37 → N_-SLP_A [11,30]
SLP_LANB AU36 N_-SLP_LAN
SLP_S0B AC35
SLP_S3B AK40 → N_-SLP_S3 [17,25,27,29]
SLP_S4B AT35 → N_-S4_S5 [17,29]
SLP_S5B_GP63 AA35
SUS_STATB_GP61 AD37 N_-SUSTAT
SUSCLK_GP62 W36 N_SUSCLK
GP72 AJ40 N_GPIO72
SUSACKB AJ37
SUSWARNB_SUSPWRDNACK_GP30 AG41 N_-S_WARN
DRAMPWRGD AE38 N_DRAM_PWROK
GP27 AU34 N_GPIO27
ACPRESENT_GP31_MGPIO2 AM36 N_GPIO31
SLP_SUSB AK38 → N_-DEPSLP [25]
PWRBTNB AK41 → O_PWRBTSW [17]
SYS_RESETB N36 N_-SYS_RST → N_-SYS_RST [4,21,26]
SPKR R32 N_SPKR → N_SPKR [21]
PROCPWRGD D40 N_CPUPWROK → N_CPUPWROK [4,25]

TP13 W37 N_PCH_RST
JTAG_TCK Y40 N_PCH_TCK
JTAG_TDI W39 N_PCH_TDI
JTAG_TDO Y38 N_PCH_TDO
JTAG_TMS W40 N_PCH_TMS

CHIP DH82Z87 C2 INTEL/[10HB1-030Z87-20R]

DDR_15V
NR131 680/4/1
N_DRAM_PWROK → N_DRAM_PWROK [4]
NR132 1.47K/4/1

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

ACZ_SDOUT

NR140 8.2K/4 C_ACZ_SDOUT
NQ14 PMBT2907A/SOT23/-600mA/50 S0T23
N_GPIO57 NR64 8.2K/4
DS_ME NR178 8.2K/4
[17] DS_ME
3VDUAL_PCH
SPI OVERRIDE PROTECTION

PCH_DPWROK

At least 10ms delay after 3VDUAL_PCH stabel
3VDUAL_PCH
NR69 8.2K/4
N_PCH_DPWROK
5VSB
NR94 22K/4
NC17 1n/4/X7R/50V/K
S0T23
NQ4 MMBT2222A/SOT23/600mA/40
NQ3 MMBT2222A/SOT23/600mA/40 S0T23
3VDUAL_PCH
NR116 75K/4/1
NR93 27K/4/1
NC21 1u/4/X5R/6.3V/K
NR233 0/4
5VSB
At least 40ns lead fall to 0V before 3VDUAL_PCH fall to 2V
NR234 6.19K/4/1/X
NQ2 MMBT2222A/SOT23/600mA/40/X S0T23
NR235 1K/4/1/X

PCH PU/PD

3VDUAL
NR139 8.2K/4/X N_GPIO46
NR155 8.2K/4/X N_GPIO45
NR103 8.2K/4/X N_GPIO44
N_GPIO57
NRN9 8.2K/8P4R/4
A_-SKTOCC
N_TEMP_ALART-
N_-RI
NRN10 8.2K/8P4R/4
GP8:Low to enable PCH clock chip
NR106 1K/4/1 N_-IGC_EN NR105 8.2K/4/X
NR153 1K/4/1/X N_SUSCLK NR154 8.2K/4/X
SUSCLK:Low to OD PLL VR
N_SUSTAT NR133 8.2K/4/X
-D_GPIO_HRST NR51 1K/4/1
N_GPIO28 NR144 1K/4/1
GP28:Lo disable VRM ,Hi enable VRM
N_GPIO29 NR96 1K/4/1
3VDUAL_PCH
N_-S_WARN NR129 8.2K/4
N_GPIO27 NR60 8.2K/4
N_GPIO31 NR72 8.2K/4
N_-SLP_LAN NR73 8.2K/4/X
N_GPIO72 NR100 8.2K/4
N_-PCIE_WAKE NR76 1K/4/1
N_GPIO29 NR95 1K/4/1/X
VCC3
NR145 8.2K/4/X N_GPIO20 NR109 1K/4/1
N_GPIO0 NR115 8.2K/4
N_-SYS_RST NR164 8.2K/4
N_GPIO32 NR162 8.2K/4/X
NR48 8.2K/4/X N_GPIO33 NR49 8.2K/4
3VDUAL
N_PCH_RST NR172 20K/4/1
N_PCH_TDI NR170 200/4/1
N_PCH_TDO NR141 200/4/1
N_PCH_TMS NR169 200/4/1
N_PCH_TCK NR87 200/4/1/X
N_PCH_RST NR143 1K/4/1/X
N_PCH_TDI NR171 100/4/1
N_PCH_TDO NR168 100/4/1
N_PCH_TMS NR142 100/4/1
N_PCH_TCK NR108 51/4/1
N_GPIO18 NR79 8.2K/4
N_GPIO73 NR134 8.2K/4
N_GPIO26 NR107 8.2K/4
N_GPIO25 NR137 8.2K/4
N_-SYS_RST NC58 1n/4/X7R/50V/K
N_DRAM_PWROK NC59 1n/4/X7R/50V/K

HSW_STRAP13

3VDUAL_PCH
NR182 8.2K/4/X → A_HSW_STRAP13 [4]
NR183 8.2K/4
S0T23
NQ11 MMBT2222A/SOT23/600mA/40
VCC3
NR136 1K/4/1/X
NR135 8.2K/4
NQ12 MMBT2222A/SOT23/600mA/40 S0T23
N_-IGC_EN
NR104 0/4/SHT/M/X

32.768KHZ

NX2-SHT SHW/D0.64*5.08*6.74
N_Y1
N_Y2 NR75 10M/4
NX2
32.768K/12.5p/20ppm/TF38/35K/D
NC16 18P/4/NPO/50V/J
NC18 18P/4/NPO/50V/J

CLR_CMOS

BATTERY CR2032
ND1 BAS40-05/0.2A/SOT23
3VDUAL_PCH
NR90 390K/4 N_DSWVRMEN
N_RTCVDD → N_RTCVDD [13,19]
NR67 390K/4 N_INTVRMEN
NR78 20K/4/1 N_-RTCRST
NC15 1u/4/X5R/6.3V/K
NC20 1u/4/X5R/6.3V/K
N_VBATT NRB 1K/4/1
NR340 0/6/SHT/M/X
BAT BAT-SK/BK/P/S/D/SN
RB_TP
N_VBAT → N_VBAT [17]
BATTERY-DUAL-4
RB 必须放在BAT外
CLR_CMOS
N_-RTCRST
PH/1*2/BK/2.54/VA/D
N_-INTRUDER NR74 1M/4 → N_RTCVDD [13,19]
N_-SRTCRST NR77 20K/4/1 → N_RTCVDD [13,19]
NC19 1u/4/X5R/6.3V/K

NRN6 8.2K/8P4R/4
3VDUAL
N_-LPCPME
N_GPIO60
N_-PCH_HOT
NR117 1K/4/1 N_SML1CLK
NR120 1K/4/1 N_SML1DAT
NR122 499/4/1 N_SML0CLK
NR123 499/4/1 N_SML0DAT
NR121 1K/4/1 N_SMBCLK
NR97 1K/4/1 N_SMBDATA

Gigabyte Technology

Title: PCH GPIO , CTRL , AUDIO

Size: Custom | Document Number: GA-Z87M-HD3 | Rev: 1.1

Date: Tuesday, July 23, 2013 | Sheet 12 of 32

PCH (H)

PCHH

CHIP DH82Z87 C2 INTEL/[10HB1-030Z87-20R]

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/6X5R/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

H87 N/A

NRN5 0/8P4R/4 VCC3_ME VCC3

NRN1 0/8P4R/4 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 NBC26 NBC27 NBC20 NBC59 1u/4/X5R/6.3V/K

(1.05V)(X5)

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

(1.05V)(X6)

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

(1.05V)(X2)

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

(3.3V)(X2)

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

(1.05V)(X10)

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

PCH (I)

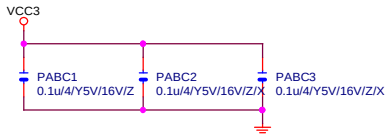
PCHI

CHIP DH82Z87 C2 INTEL/[10HB1-030Z87-20R]

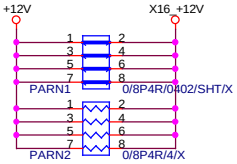
Title	PCH PWR ,GND
Size	Custom
Document Number	GA-Z87M-HD3
Rev	1.1
Date:	Tuesday, July 23, 2013
Sheet	13 of 32

Gigabyte Technology

PCIEX16 CAP



PCIEX16 PROTECT SHT



PCIEX16 AC CAP

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

PA_EXP_RXP[0..15] PA_EXP_RXP[0..15] [4]
PA_EXP_RXN[0..15] PA_EXP_RXN[0..15] [4]
PA_EXP_TXP[0..15] PA_EXP_TXP[0..15] [4]
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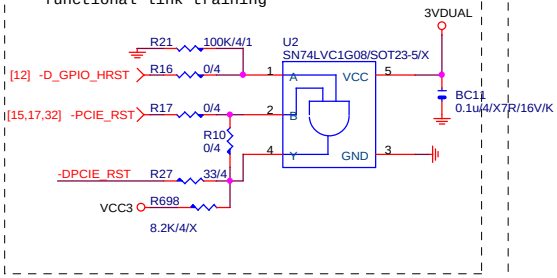
The auxiliary reset circuit is only required for PCIe Gen3 margining and functional link training



PCIEX16 SLOT

PCIESLOT-164DN-P

3GIO_*16

PCIEX16

B1	12V	PRSNT1*	A1
B2	12V	12V	A2
B3	RSVD	12V	A3
B4	GND	GND	A4
B5	SMCLK	JTAG2	A5
B6	SMDAT	JTAG3	A6
B7	GND	JTAG4	A7
B8	3.3V	JTAG5	A8
B9	JTAG1	3.3V	A9
B10	3.3VAUX	3.3V	A10
B11	WAKE*	PWRGD	A11
	KEY		
B12	RSVD	GND	A12
B13	GND	REFCLK+	A13
B14	HSOP0	REFCLK-	A14
B15	HSON0	GND	A15
B16	GND	HSIP0	A16
B17	PRSNT2*	HSIN0	A17
B18	GND	GND	A18
B19	HSOP1	RSVD	A19
B20	HSON1	GND	A20
B21	GND	HSIP1	A21
B22	GND	HSIN1	A22
B23	HSOP2	GND	A23
B24	HSON2	GND	A24
B25	GND	HSIP2	A25
B26	GND	HSIN2	A26
B27	HSOP3	GND	A27
B28	HSON3	GND	A28
B29	GND	HSIP3	A29
B30	RSVD	HSIN3	A30
B31	PRSNT2*	GND	A31
B32	GND	RSVD	A32
B33	HSOP4	RSVD	A33
B34	HSON4	GND	A34
B35	GND	HSIP4	A35
B36	GND	HSIN4	A36
B37	HSOP5	GND	A37
B38	HSON5	GND	A38
B39	GND	HSIP5	A39
B40	GND	HSIN5	A40
B41	HSOP6	GND	A41
B42	HSON6	GND	A42
B43	GND	HSIP6	A43
B44	GND	HSIN6	A44
B45	HSOP7	GND	A45
B46	HSON7	GND	A46
B47	GND	HSIP7	A47
B48	PRSNT2*	HSIN7	A48
B49	GND	GND	A49
B50	HSOP8	RSVD	A50
B51	HSON8	GND	A51
B52	GND	HSIP8	A52
B53	GND	HSIN8	A53
B54	HSOP9	GND	A54
B55	HSON9	GND	A55
B56	GND	HSIP9	A56
B57	GND	HSIN9	A57
B58	HSOP10	GND	A58
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B60	GND	HSIP10	A60
B61	GND	HSIN10	A61
B62	HSOP11	GND	A62
B63	HSON11	GND	A63
B64	GND	HSIP11	A64
B65	GND	HSIN11	A65
B66	HSOP12	GND	A66
B67	HSON12	GND	A67
B68	GND	HSIP12	A68
B69	GND	HSIN12	A69
B70	HSOP13	GND	A70
B71	HSON13	GND	A71
B72	GND	HSIP13	A72
B73	GND	HSIN13	A73
B74	HSOP14	GND	A74
B75	HSON14	GND	A75
B76	GND	HSIP14	A76
B77	GND	HSIN14	A77
B78	HSOP15	GND	A78
B79	HSON15	GND	A79
B80	GND	HSIP15	A80
B81	PRSNT2*	HSIN15	A81
B82	RSVD	GND	A82

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

BLACK CONNECTOR

PAR1 0/4/SHT/M/X
PAR2 0/4/SHT/M/X
PAR3 0/4/SHT/M/X
VCC3
-DPCIE_RST
PAC1 22p/4/NPO/50V/J/X
[7,8,12,15,16,19,26,27] N_SMBCLK
[7,8,12,15,16,19,26,27] N_SMBDATA
[12,15,24,32] N_-PCIE_WAKE
PA_SRCCLK_3GIO [10]
PA_-SRCCLK_3GIO [10]

Gigabyte Technology		
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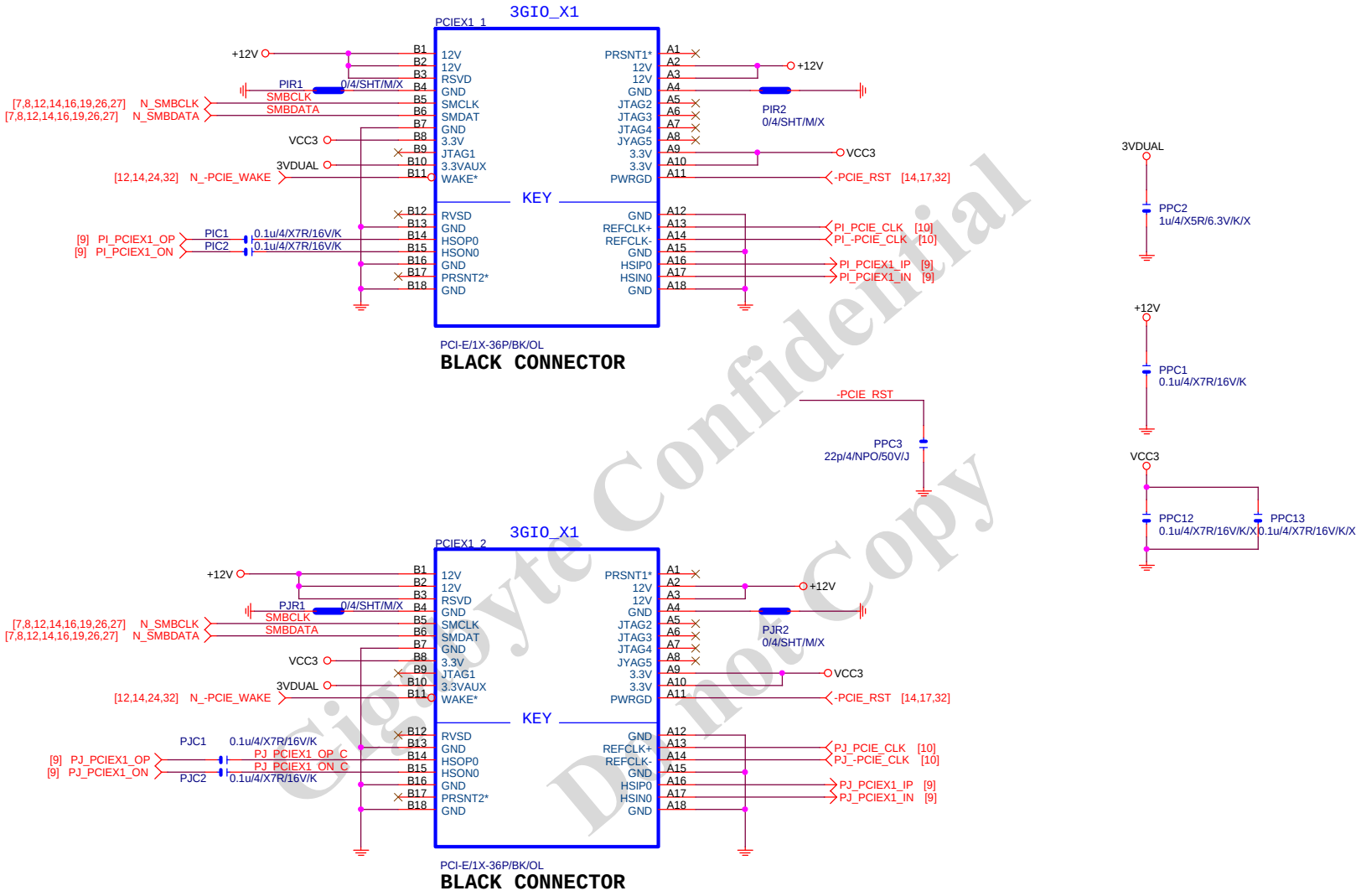
Size: Custom	Document Number: GA-Z87M-HD3	Rev: 1.1
Date: Tuesday, July 23, 2013	Sheet 14 of 32	

PCIEX1 SLOT



Gigabyte Technology		
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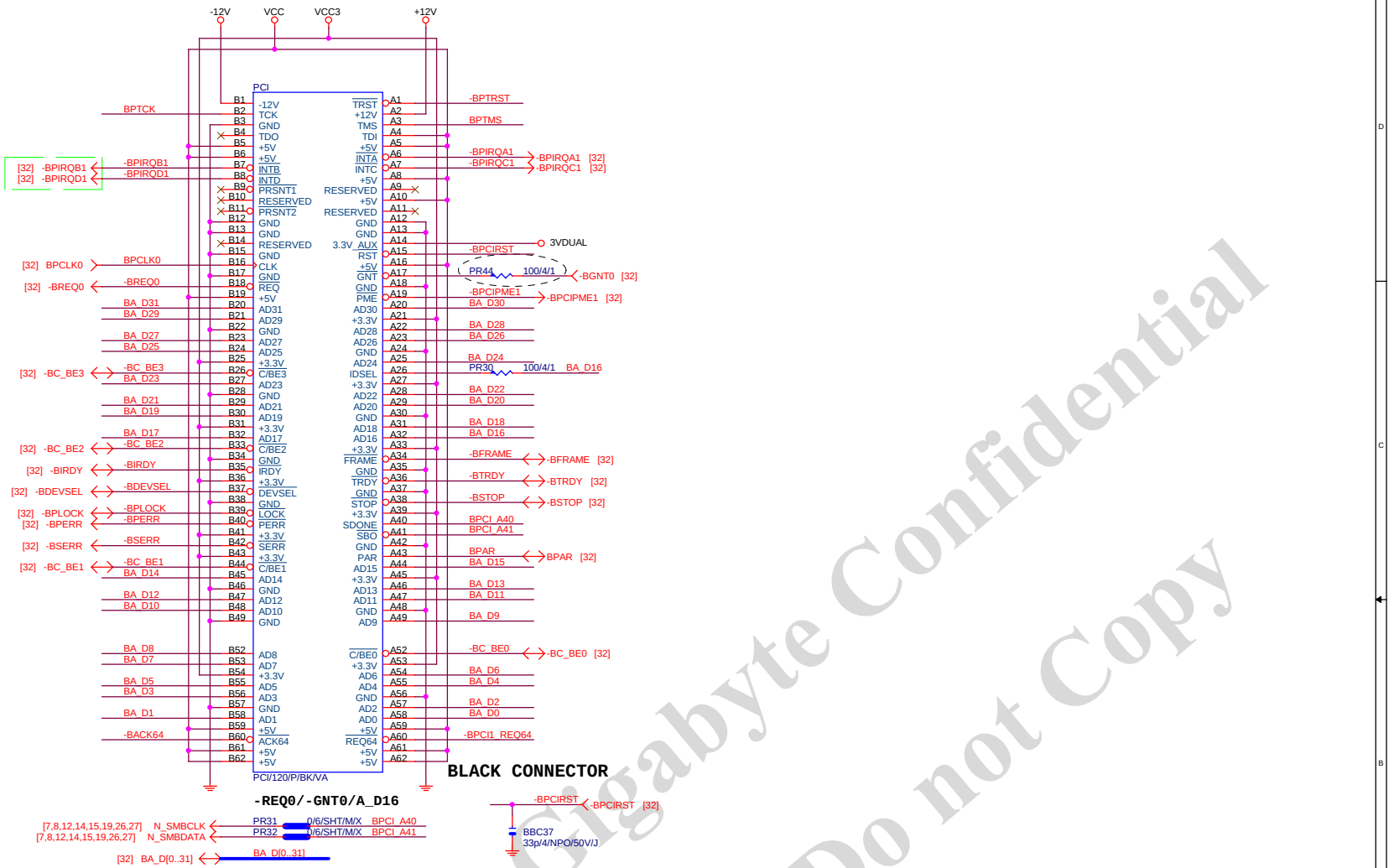
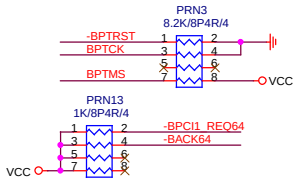
Size: Custom	Document Number: GA-Z87M-HD3	Rev: 1.1
Date: Tuesday, July 23, 2013	Sheet 15 of 32	

PCI SLOT 1



PCI PU



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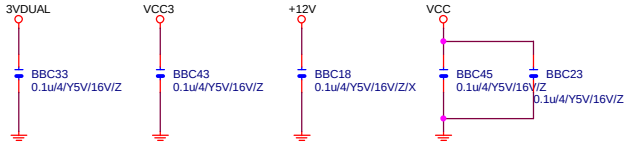

Gigabyte Technology		
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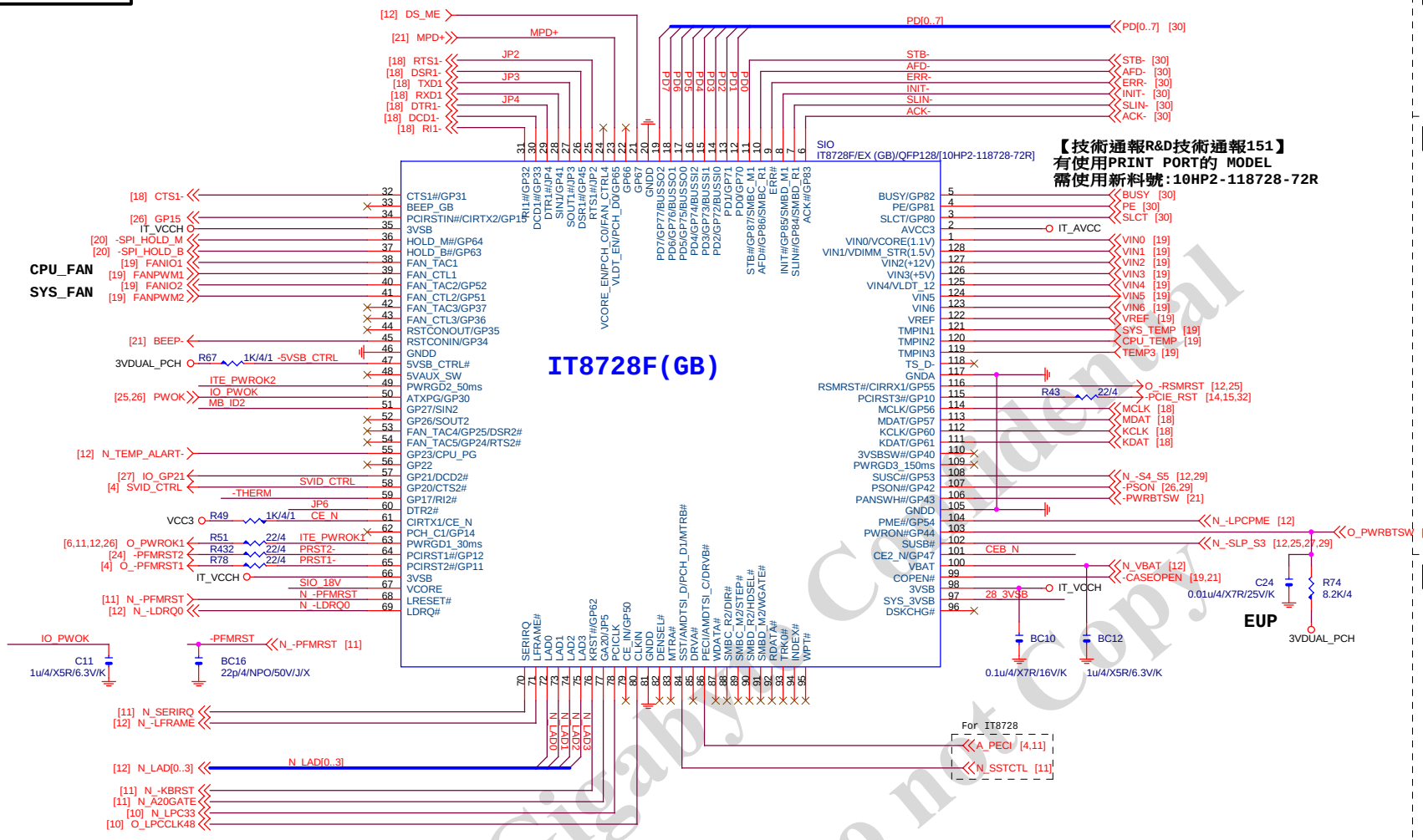
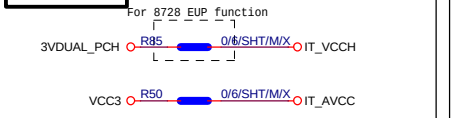
Size: Custom	Document Number: GA-Z87M-HD3	Rev: 1.1
Date: Tuesday, July 23, 2013	Sheet 16 of 32	

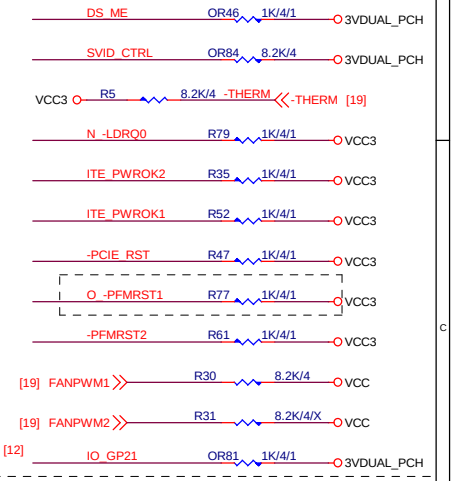
SIO IT8728F



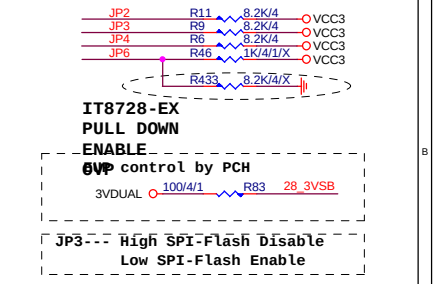
PWR SHT



SIO PU



SIO STRAP

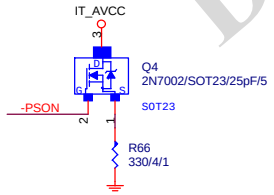


IT8728F NOTE

	IT8728
PIN121	VCORE_EN/PCH_C0
PIN120	VLDT_EN/PCH_D0
PIN19	ATXPG
PIN31	PCH_C1
PIN53	SST/AMDTSI_D/MTRB#/PCH_D1
PIN55	PECI/AMDTSI_C/DRVB#
PIN66	SYS_3VSB
PIN70	GP47
PIN95	VIN2(VCC5)
PIN96	VIN1(VCC12)
PIN97	VIN1/VDIMM_STR(1.5V)
PIN98	VIN0/VCORE(1.1V)/NC

DUAL BIOS OPT STRAP

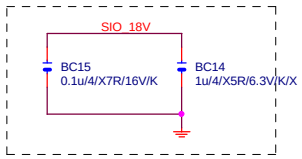
Power leakage



For IT8721 Power leakage

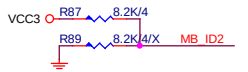
SIO_18V

internal power pin, max 22nF cap

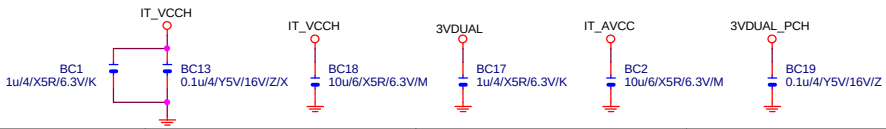


FOR LOW TEMP POWER ON INTO TEST MODE ISSUE

MB ID



SIO CAP



Gigabyte Technology

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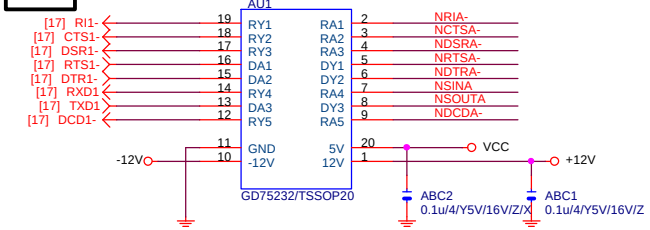
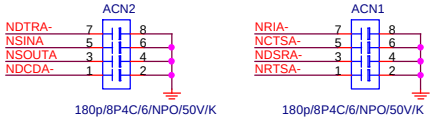
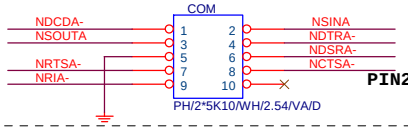
Size: Custom	Document Number: GA-Z87M-HD3	Rev: 1.1
Date: Tuesday, July 23, 2013	Sheet 17 of 32	

COM

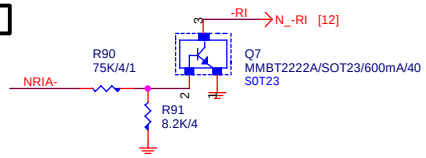




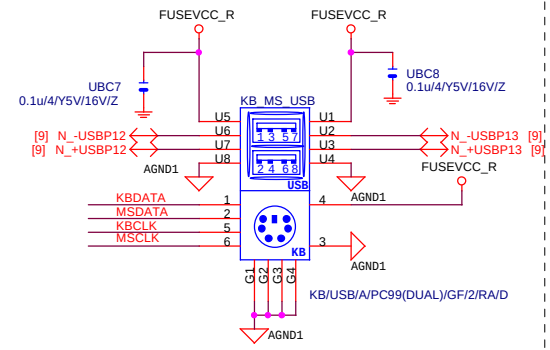


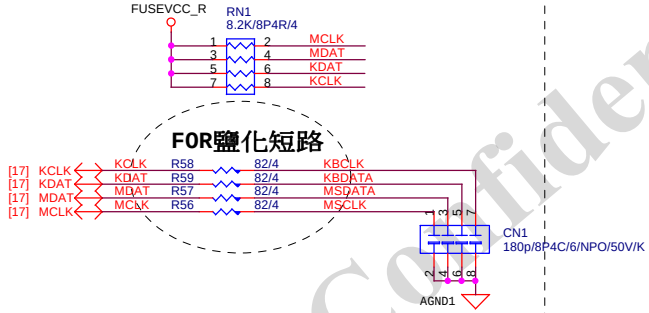
PIN2X5-CUT10-COM

COM RI

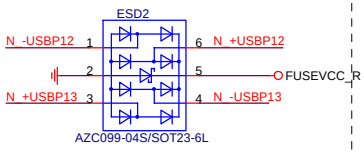


KB/MS





USB2.0 ESD



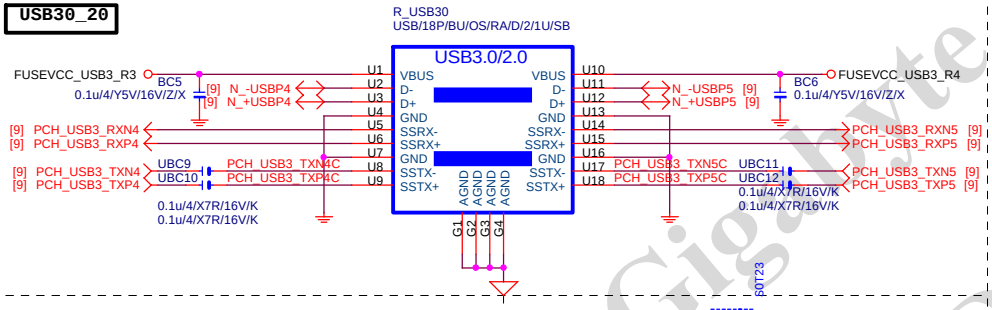
USB2.0 PWR

FUSE-0805

Close to connector

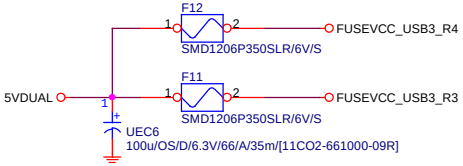
KB_MS_USB 2-Port 2.0A

USB30_20



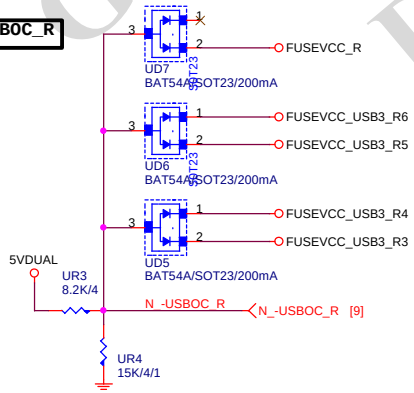
USB30_20 PWR

Polyswitch-1206



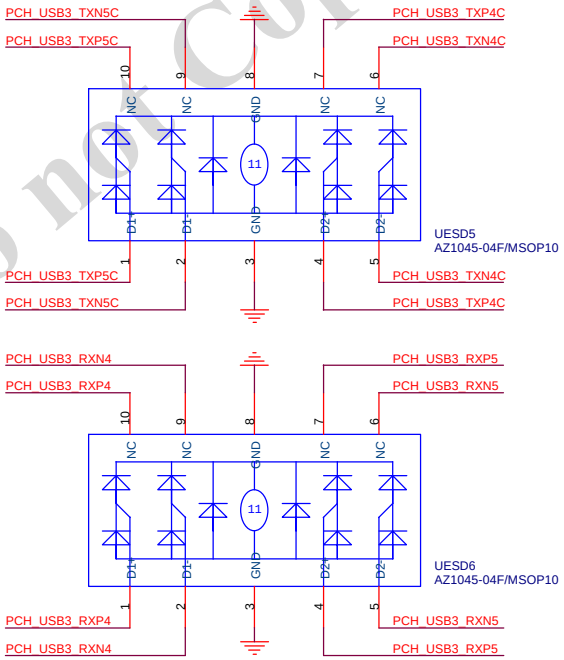
USB3.0 1Port - 1Fuse (3.5A)

-USBOC_R

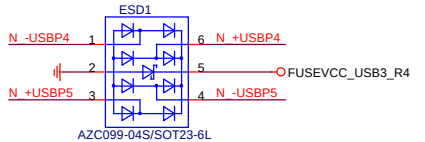


USB30_20 ESD PROCTECT

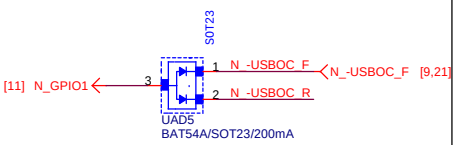
USB3.0 ESD



USB2.0 ESD

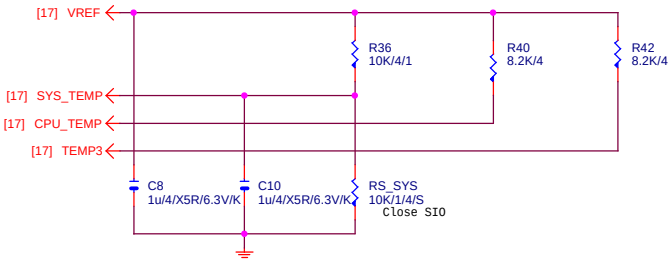


USB POWER PROTECT

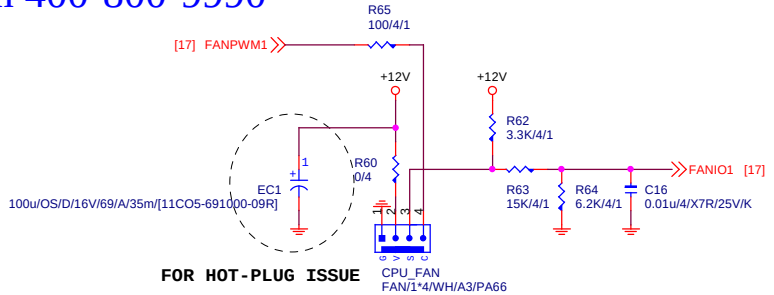


Gigabyte Technology	
Title	COM,-RI,KB_USB,USB_ESATA,-PROCHOT
Size: Custom	Document Number: GA-Z87M-HD3
Rev	1.1
Date: Tuesday, July 23, 2013	Sheet 18 of 32

TEMP H/W MONITOR



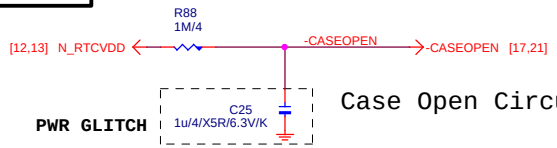
CPU SMART FAN



FOR HOT-PLUG ISSUE

WHITE CONNECTOR

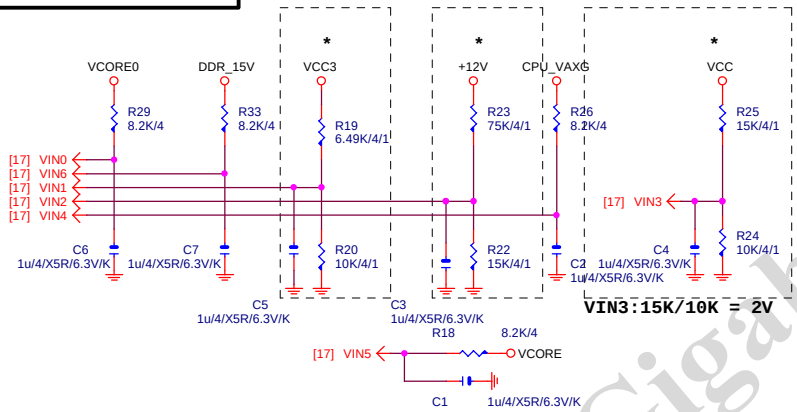
CASE OPEN



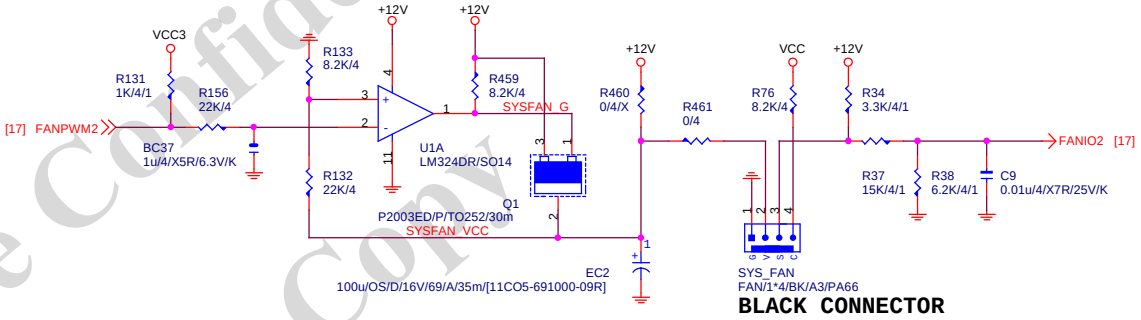
PWR GLITCH

Case Open Circuits

VOLTAGE-- H/W MONITOR

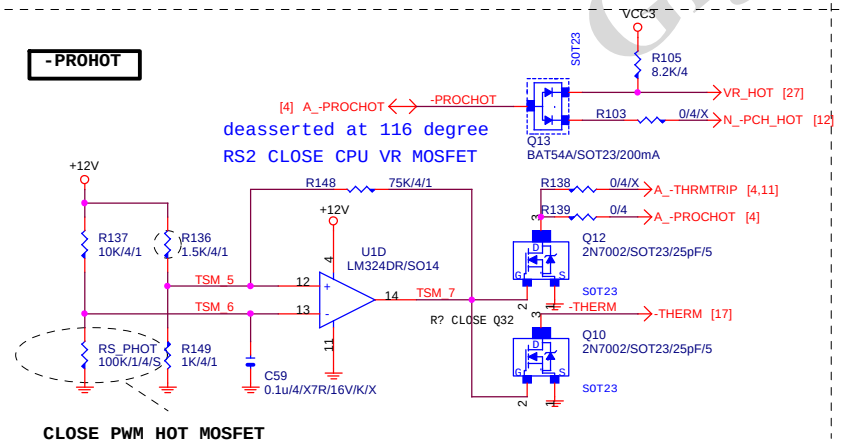


SYS SMART FAN



BLACK CONNECTOR

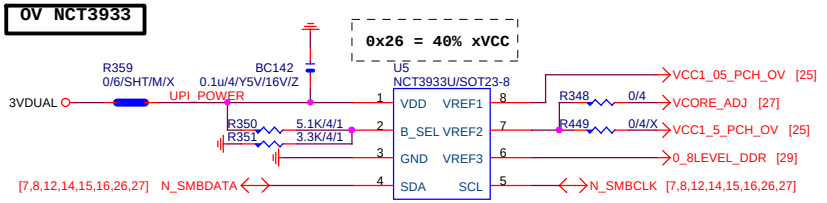
-PROHOT



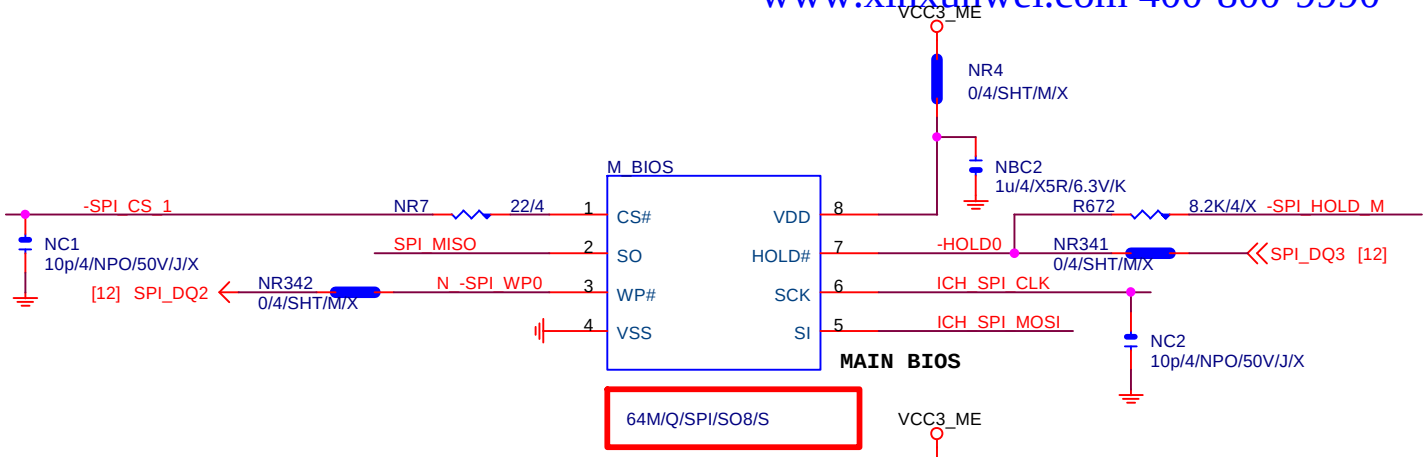
CLOSE PWM HOT MOSFET

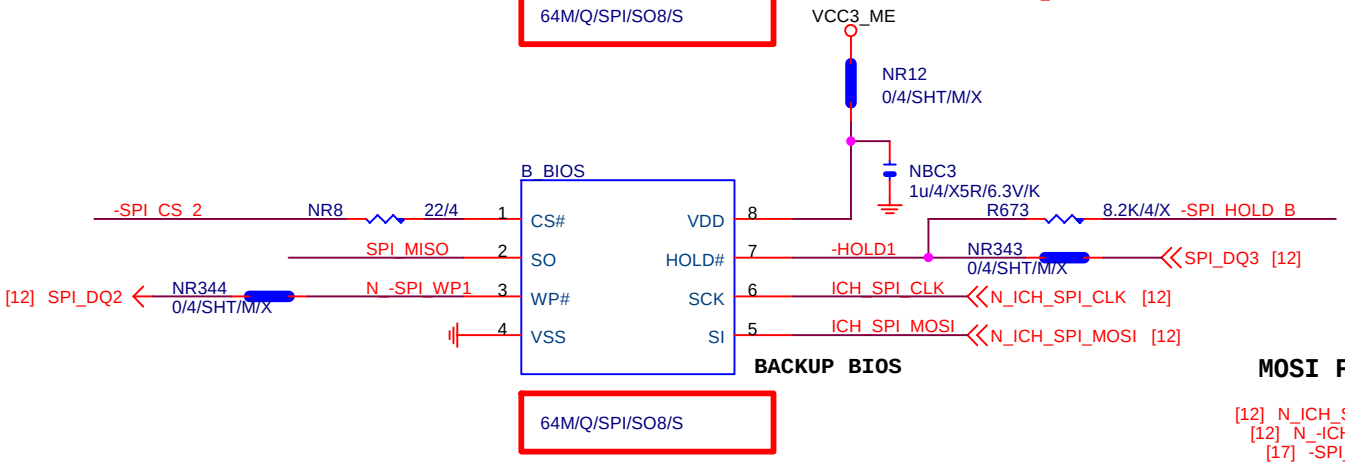
接pwm feedback pin

OV NCT3933



Gigabyte Technology		
Title: HWM,FAN CTRL,OV		
Size: Custom	Document Number: GA-Z87M-HD3	Rev: 1.1
Date: Tuesday, July 23, 2013	Sheet 19 of 32	

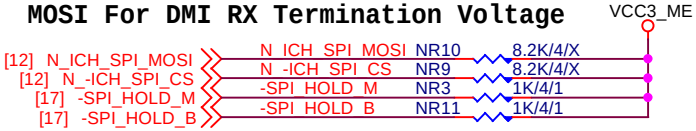


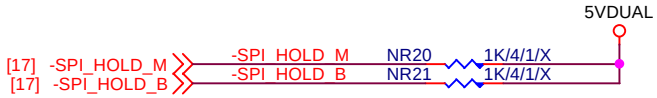


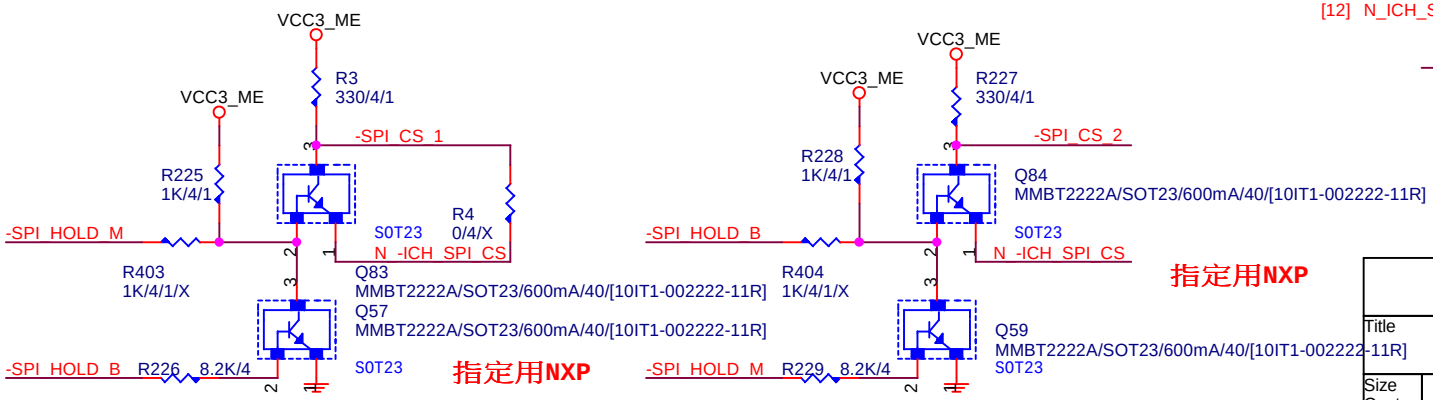
BOOT DEVICE	GNT0	GNT1
LPC	0	0
PCI	0	1
NAND	1	0
SPI	1	1

1 means floating
0 means PD 1K

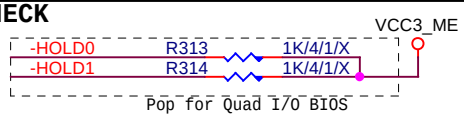
MOSI For DMI RX Termination Voltage





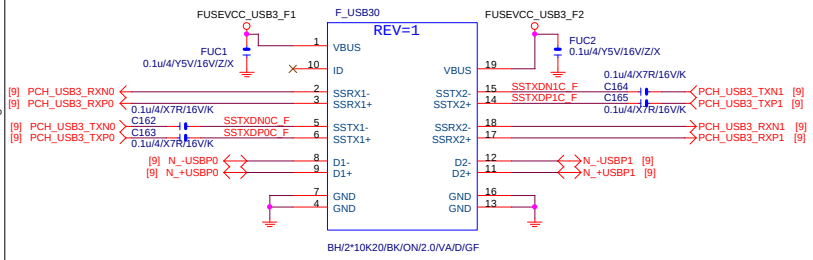


CHECK



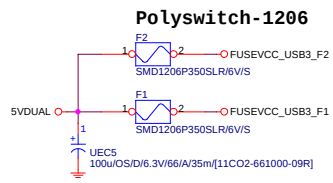
Gigabyte Technology			
Title: DUAL BIOS			
Size: Custom	Document Number: GA-Z87M-HD3		Rev: 1.1
Date: Tuesday, July 23, 2013		Sheet 20 of 32	

F_USB30



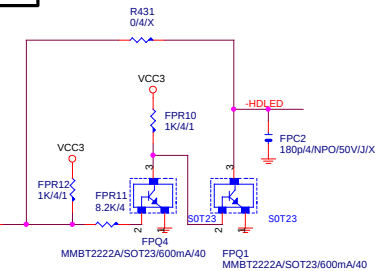
BLACK CONNECTOR

F_USB30 PWR

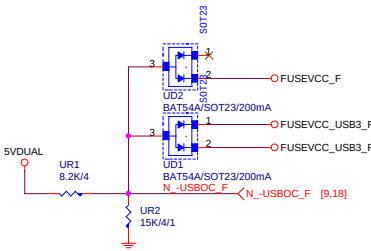


USB3.0 1Port - 1Fuse (3.5A)

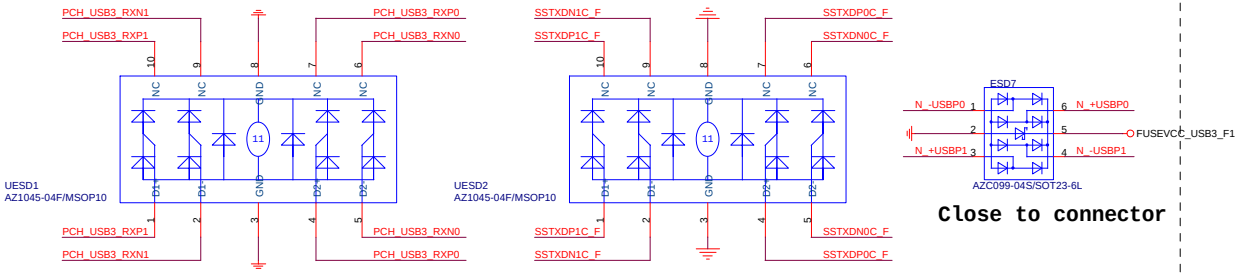
SATA LED



-USBOC_F

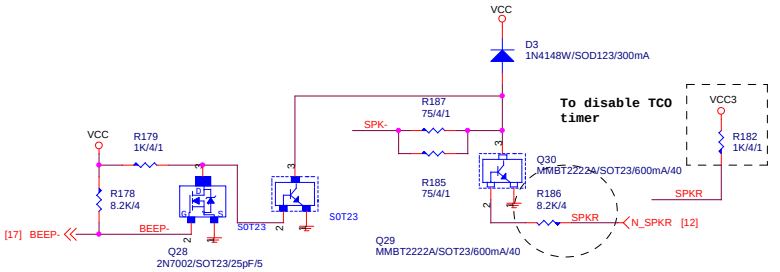


F_USB30 ESD PROTECT

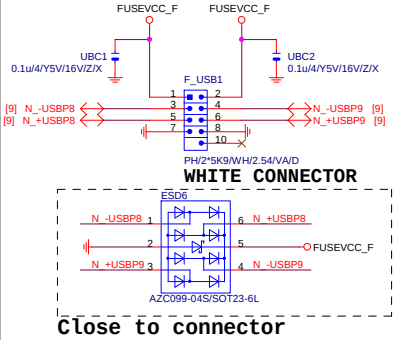


Close to connector

SPKR



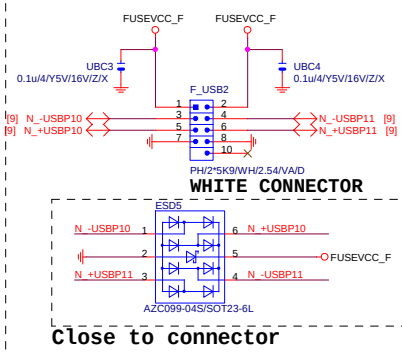
FRONT USB1



WHITE CONNECTOR

Close to connector

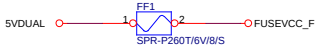
FRONT USB2



WHITE CONNECTOR

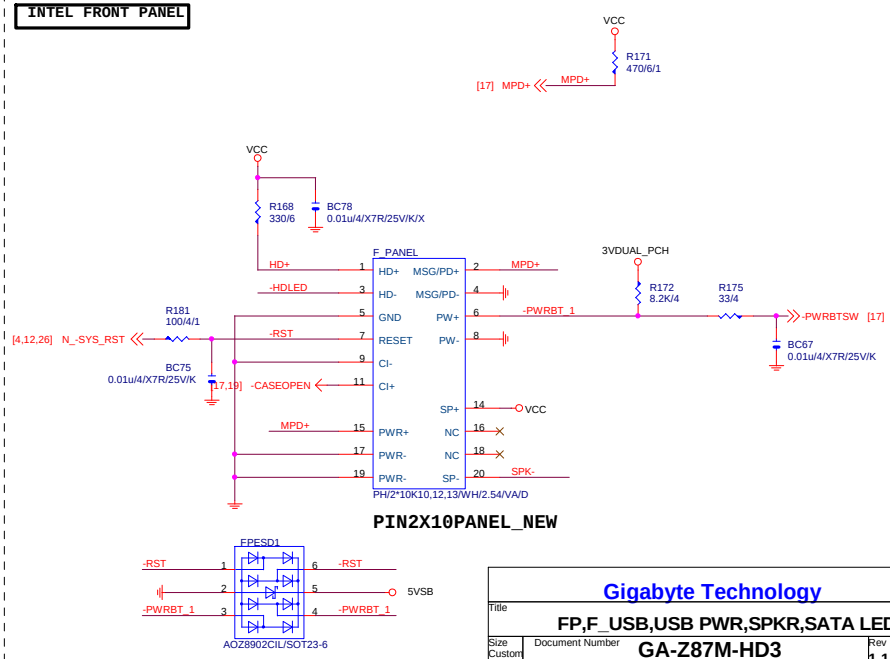
Close to connector

FUSE-0805



F_USB1, F_USB2 4-Port 2.6A

INTEL FRONT PANEL

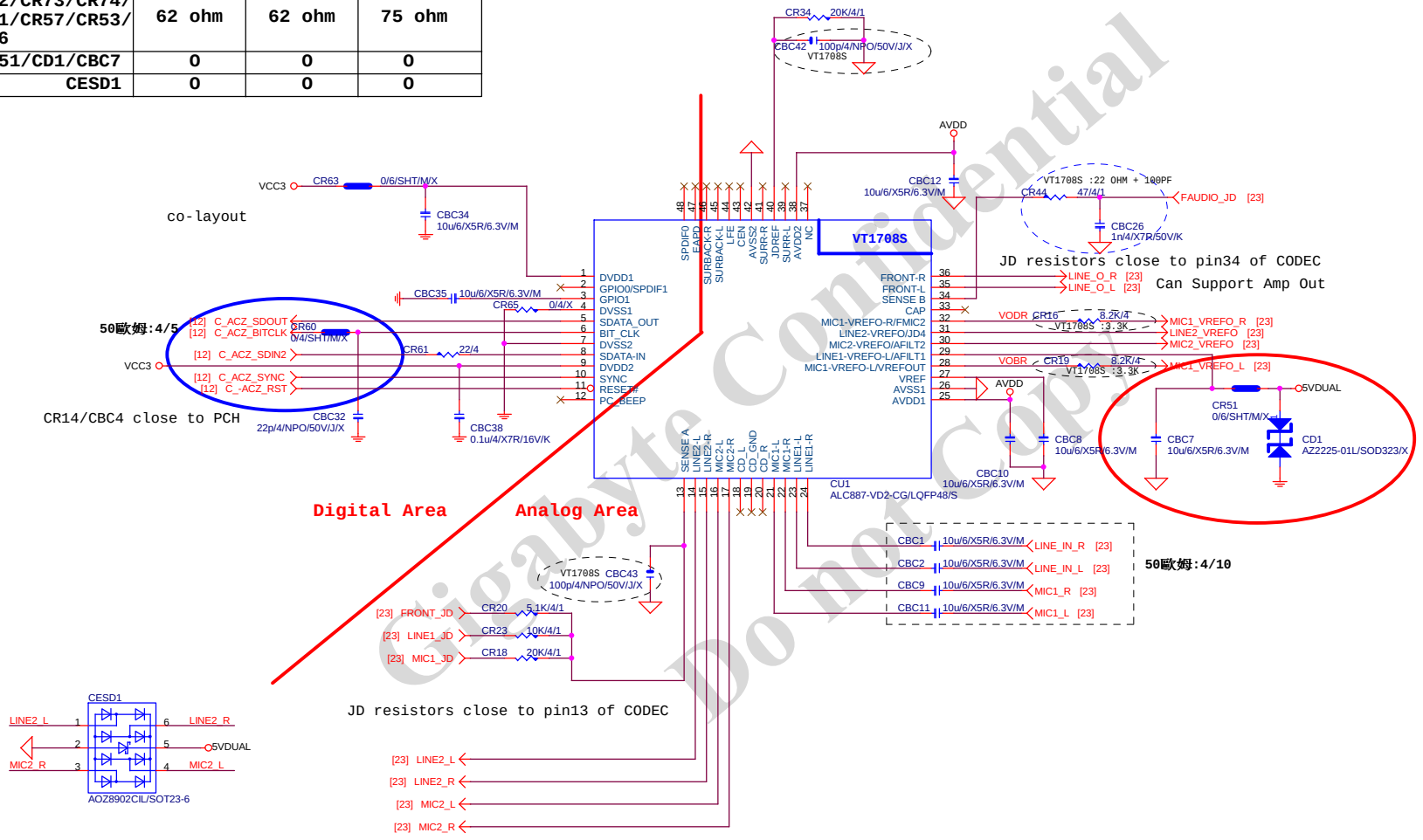


PIN2X10PANEL_NEW

Gigabyte Technology		
Title: FP,F_USB,USB PWR,SPKR,SATA LED		
Size: Custom	Document Number: GA-Z87M-HD3	Rev: 1.1
Date: Tuesday, July 23, 2013	Sheet 21 of 32	

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

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



Gigabyte Technology

Title: HD AUDIO ALC887B-VD2/VT1708S/VT2021

Size: Custom | Document Number: GA-Z87M-HD3 | Rev: 1.1

Date: Tuesday, July 23, 2013 | Sheet 22 of 32

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

LINE-OUT

CR7 22K/4
CR6 22K/4
[22] LINE_O_R — CEC1 100u/OS/D/6.3V/66/A/35m/[11CO2-661000-09R] — CR5 62/4 — AJ_B5
[22] LINE_O_L — CEC2 100u/OS/D/6.3V/66/A/35m/[11CO2-661000-09R] — CR8 62/4 — AJ_B2
CBC19 180p/4/NPO/50V/J
CBC24 180p/4/NPO/50V/J

Only reserved for ALC888

LINE-IN

[22] LINE_IN_R — CR1 62/4 — AJ_A5
[22] LINE_IN_L — CR14 62/4 — AJ_A2
CBC20 180p/4/NPO/50V/J
CBC23 180p/4/NPO/50V/J

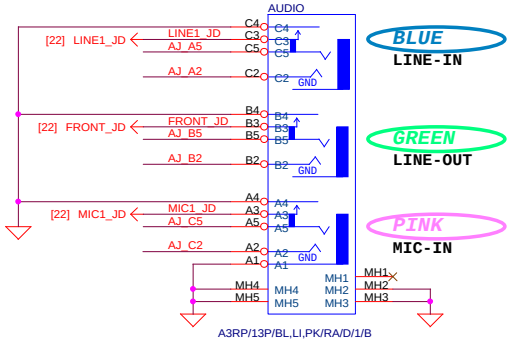
Verify MIC function in LINE-in

For 889A/888

MIC-IN

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

SPDIF_OUT



AZALIA FRONT PANEL

CQ4 BAT54A/SOT23/200mA
[22] LINE2_VREFO
CQ2 BAT54A/SOT23/200mA
[22] MIC2_VREFO
SOT23
VT1708S :3.3K
CR52 8.2K/4
CR56 8.2K/4
CR10 8.2K/4
CR9 8.2K/4
[22] MIC2_L
[22] MIC2_R
CBC6 10u/6/X5R/6.3V/M
CBC5 10u/6/X5R/6.3V/M
CR13 62/4 M2_L
CR11 62/4 M2_R
L2_R CR57 62/4 L2-R
[22] FAUDIO_JD
L2_L CR53 62/4 L2-L
CR12 0/4/X
CR58 22K/4
CR54 22K/4
F_AUDIO
CR55 20K/4/1
CR59 39.2K/4/1
VCC3
CR78 8.2K/4/X
PH/2*5K8/BK/2.54/VA/D
BLACK CONNECTOR
[22] LINE2_R
[22] LINE2_L
CEC9
CEC6
100u/OS/D/6.3V/66/A/35m/[11CO2-661000-09R]
CBC30 180p/4/NPO/50V/J
CBC29 180p/4/NPO/50V/J
CBC37 180p/4/NPO/50V/J
CBC36 180p/4/NPO/50V/J

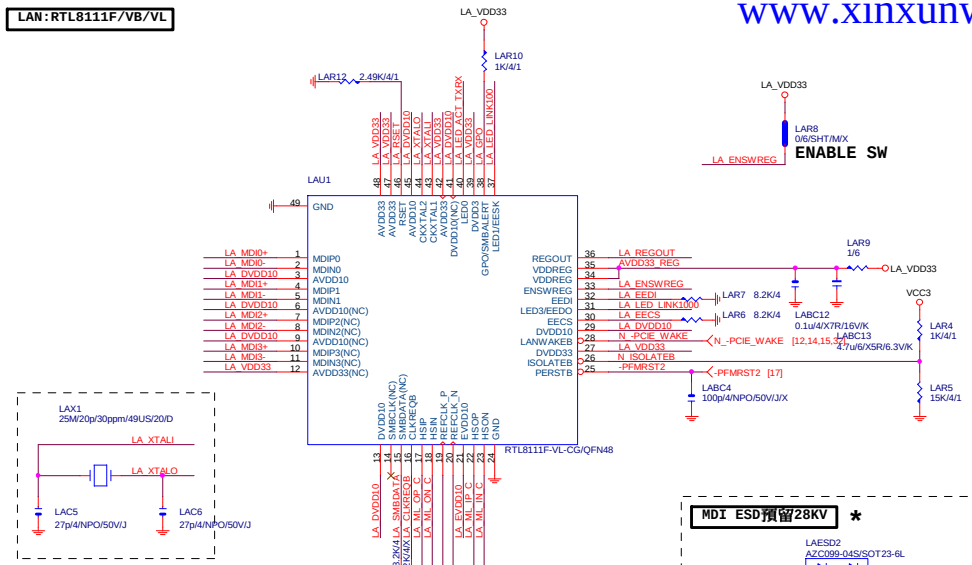
Gigabyte Technology

Title: **AUDIO JACK**

Size: Custom | Document Number: **GA-Z87M-HD3** | Rev: 1.1

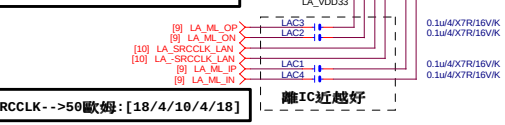
Date: Tuesday, July 23, 2013 | Sheet 23 of 32

LAN:RTL8111F/VB/VL

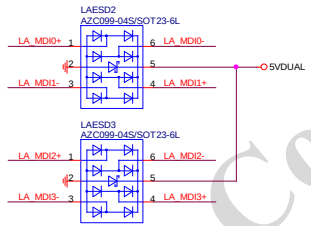


LA_ ML-->80歐姆:[15/5/5/5/15]

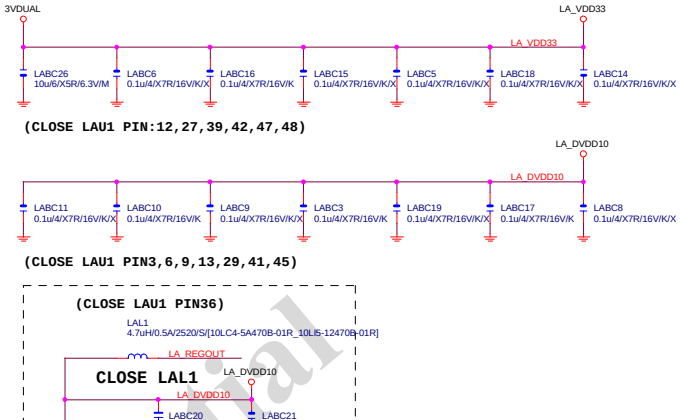
SRCCLK-->50歐姆:[18/4/10/4/18]



MDI ESD預留28KV *



LAN POWER

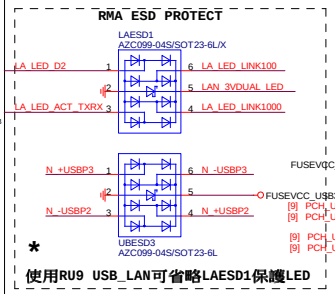


Power domain chart

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

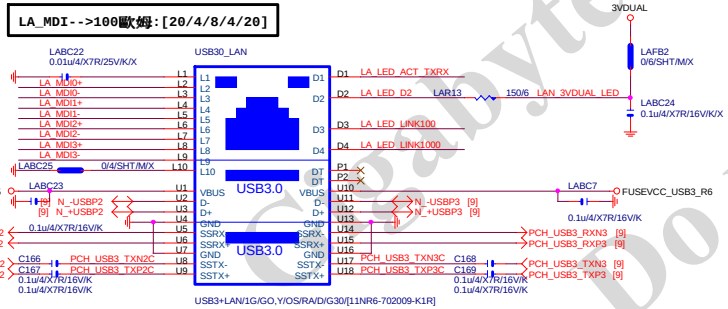
USB_LAN CONNECTOR

RMA ESD PROTECT



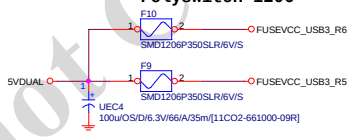
* 使用RU9 USB_LAN可省略LAESD1保護LED

LA_MDI-->100歐姆:[20/4/8/4/20]



USB3+LAN/1G/GO,Y/OS/RA/D/G30/[11NR6-702009-K1R]

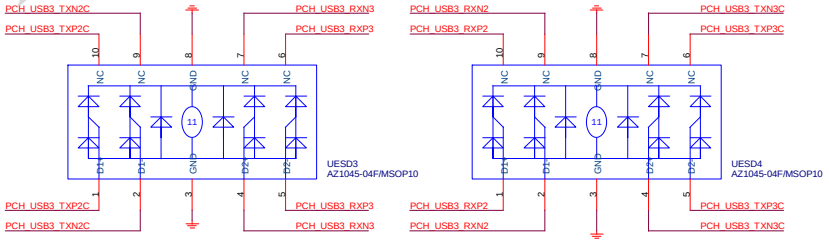
USB X3 POWER



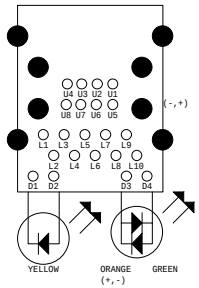
USB3.0 1Port - 1Fuse (3.5A)

EMI SHORT PAD

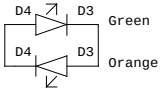
PS:視EMI需求



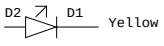
注意:USB PORT(目前:暫代6,7PORT)
USB-->90歐姆:[15/4.5/7.5/4.5/15]



Dual Color LED



Single Color LED



BOM NOTICE *

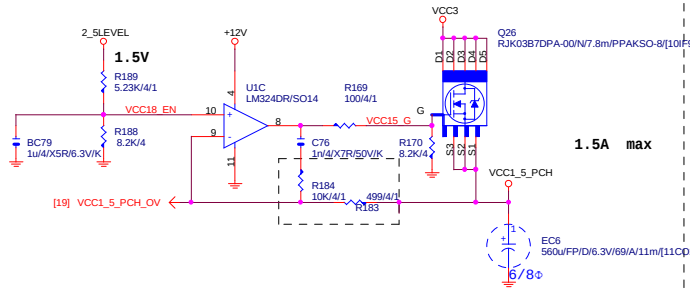
料號	規格	廠商
11NR6-702009-96R	1G LAN (12core)	UDE(RU9 ESD+)

[LED獨立走線,可省略外加AZC099料件LAESD1]

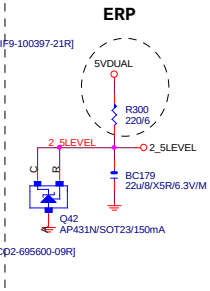
1. 9KV ESD BOM:
   USB_LAN (RU9):11NR6-702009-96R
2. 28KV ESD BOM:
   USB_LAN (RU9):11NR6-702009-96R
   LAESD2,LAESD3:上件AZC398-04S

Gigabyte Technology			
Title: Realtek RTL8111G			
Size: Custom	Document Number: GA-Z87M-HD3		Rev: 1.1
Date: Tuesday, July 23, 2013	Sheet 24 of 32		

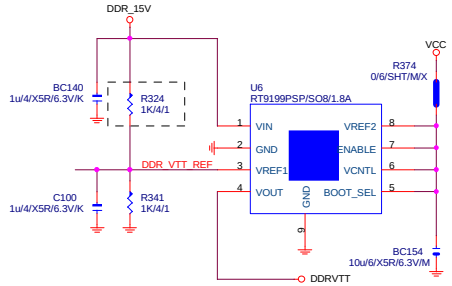
VCC1_8_PCH



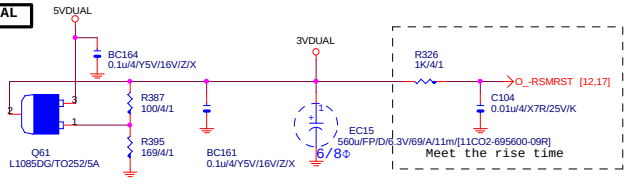
2_5LEVEL



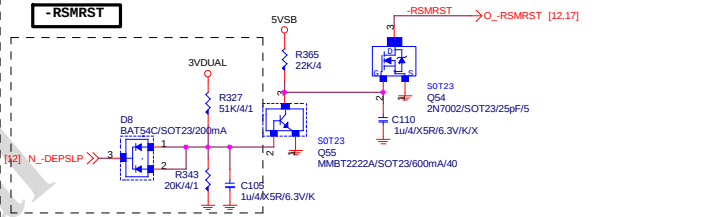
DDRVTT



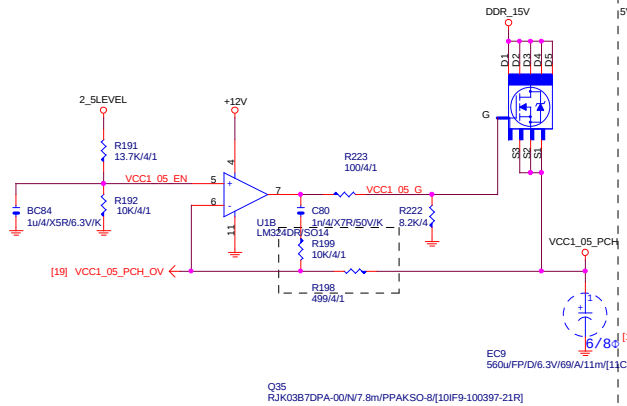
3VDUAL



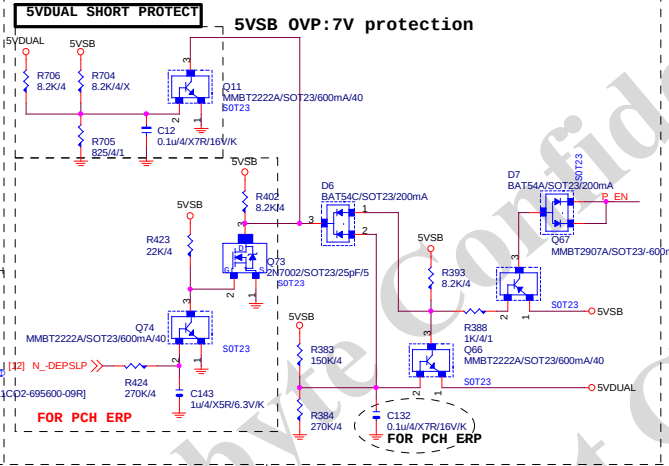
-RSMRST



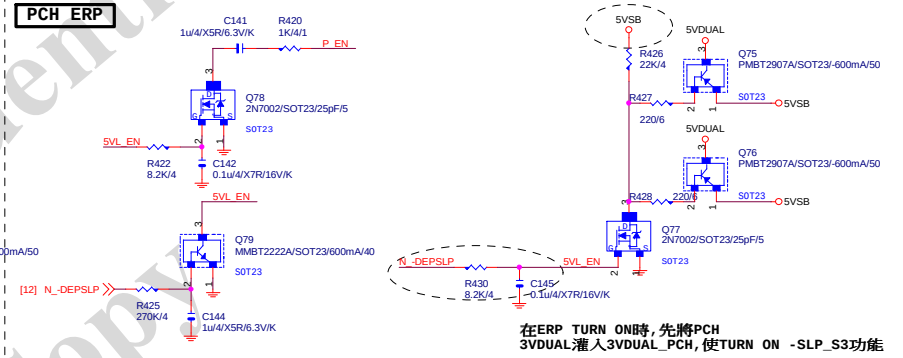
VCC1_05_PCH



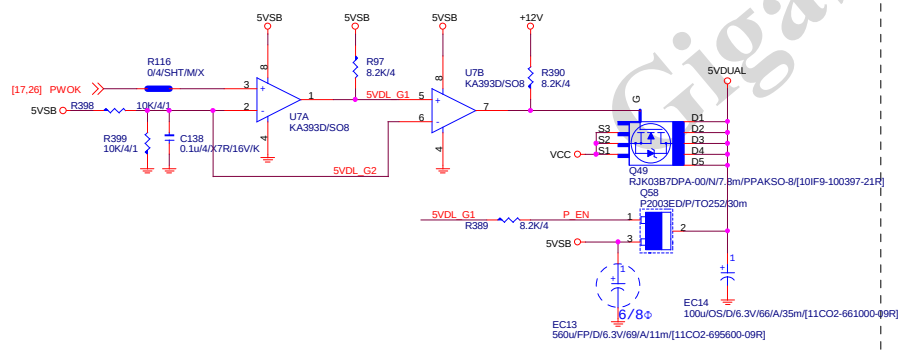
5VDUAL SHORT PROTECT



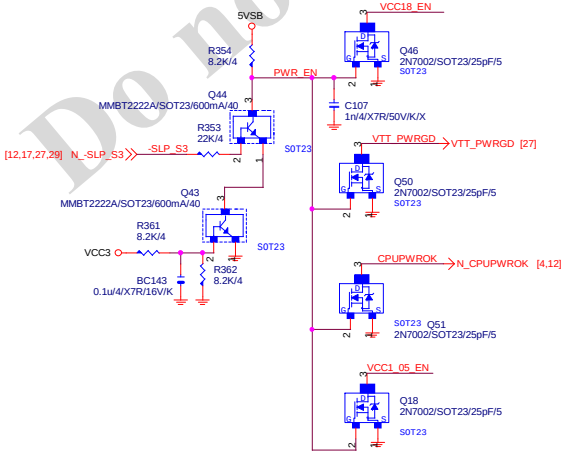
PCH_ERP



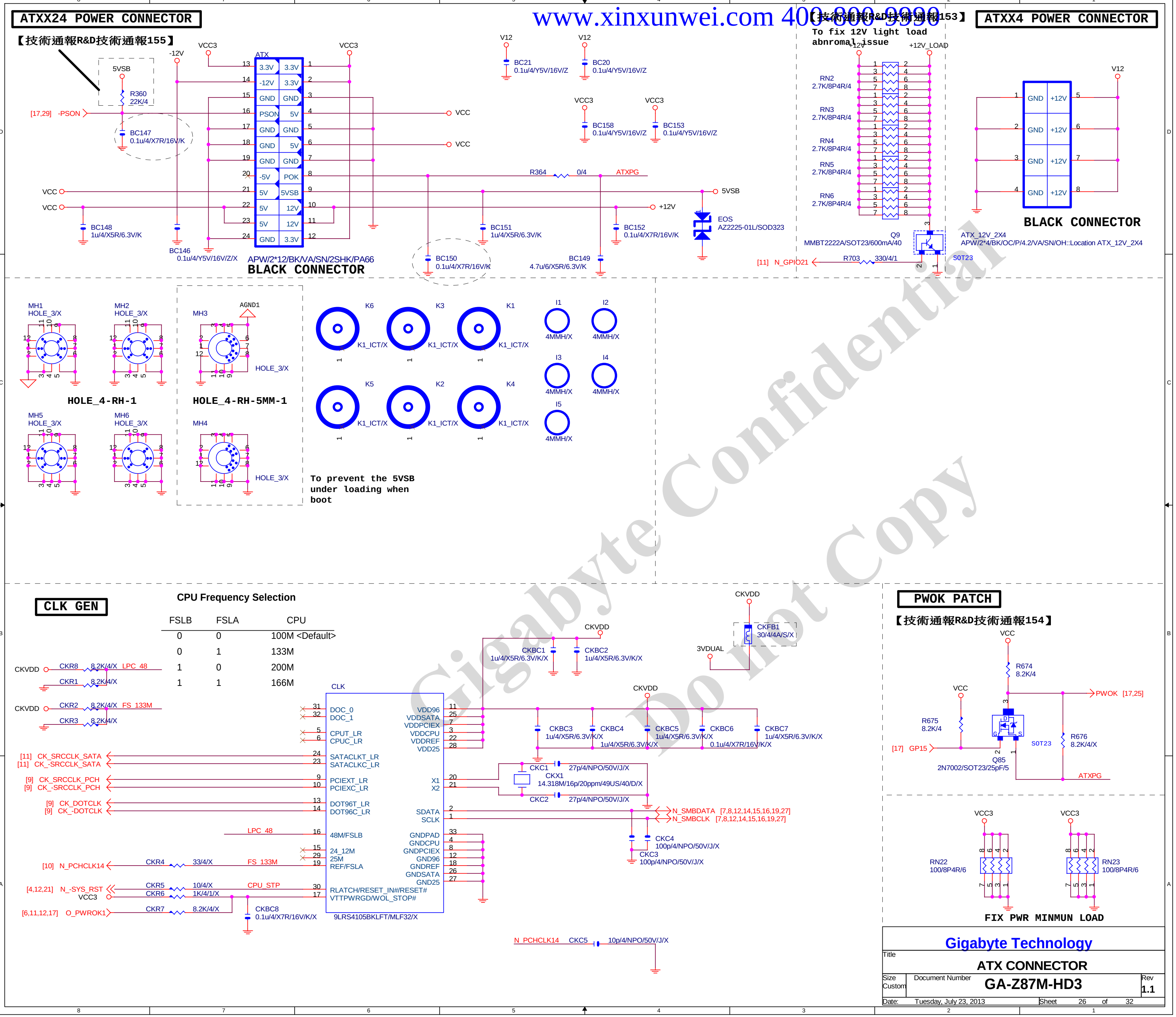
5VDUAL



PWR SEQ



Title	Gigabyte Technology DISCRETE POWER	
Size: Custom	Document Number: GA-Z87M-HD3	Rev: 1.1
Date: Tuesday, July 23, 2013	Sheet 25 of 32	


ATXX24 POWER CONNECTOR
【技術通報R&D技術通報155】
5VSB
R360 22K/4
[17,29] -PSON
BC147 0.1u/4/X7R/16V/K
-12V
VCC3
ATX
3.3V 3.3V
-12V 3.3V
GND GND
PSON 5V
GND GND
GND 5V
GND GND
-5V POK
5V 5VSB
5V 12V
5V 12V
GND 3.3V
VCC
VCC
BC148 1u/4/X5R/6.3V/K
BC146 0.1u/4/Y5V/16V/Z/X
APW/2*12/BK/VA/SN/2SHK/PA66
BLACK CONNECTOR
V12
BC21 0.1u/4/Y5V/16V/Z
BC20 0.1u/4/Y5V/16V/Z
BC158 0.1u/4/Y5V/16V/Z
BC153 0.1u/4/Y5V/16V/Z
R364 0/4 ATXPG
5VSB
+12V
BC150 0.1u/4/X7R/16V/K
BC151 1u/4/X5R/6.3V/K
BC149 4.7u/6/X5R/6.3V/K
BC152 0.1u/4/X7R/16V/K
EOS AZ2225-01L/SOD323
【技術通報R&D技術通報153】
To fix 12V light load abnromal issue
+12V +12V_LOAD
RN2 2.7K/8P4R/4
RN3 2.7K/8P4R/4
RN4 2.7K/8P4R/4
RN5 2.7K/8P4R/4
RN6 2.7K/8P4R/4
Q9 MMBT2222A/SOT23/600mA/40
[11] N_GPIO21
R703 330/4/1
SOT23
ATXX4 POWER CONNECTOR
GND +12V
BLACK CONNECTOR
ATX_12V_2X4
APW/2*4/BK/OC/P/4.2/VA/SN/OH::Location ATX_12V_2X4
MH1 HOLE_3/X
MH2 HOLE_3/X
MH3
AGND1
HOLE_3/X
HOLE_4-RH-1
HOLE_4-RH-5MM-1
MH5 HOLE_3/X
MH6 HOLE_3/X
MH4
K6 K3 K1 K5 K2 K4
K1_ICT/X
I1 I2 I3 I4 I5
4MMH/X
To prevent the 5VSB under loading when boot
CLK GEN
CKVDD
CKR8 8.2K/4/X LPC_48
CKR1 8.2K/4/X
CKR2 8.2K/4/X FS_133M
CKR3 8.2K/4/X
[11] CK_SRCCLK_SATA
[11] CK_-SRCCLK_SATA
[9] CK_SRCCLK_PCH
[9] CK_-SRCCLK_PCH
[9] CK_DOTCLK
[9] CK_-DOTCLK
LPC_48
[10] N_PCHCLK14
CKR4 33/4/X FS_133M
[4,12,21] N_-SYS_RST
CKR5 10/4/X CPU_STP
CKR6 1K/4/1/X
VCC3
[6,11,12,17] O_PWROK1
CKR7 8.2K/4/X
CKBC8 0.1u/4/X7R/16V/K/X
CLK
DOC_0
DOC_1
CPUT_LR
CPUC_LR
SATACLKT_LR
SATACLKC_LR
PCIEXT_LR
PCIEXC_LR
DOT96T_LR
DOT96C_LR
48M/FSLB
24_12M
25M
REF/FSLA
RLATCH/RESET_IN#/RESET#
VTTPWRGD/WOL_STOP#
VDD96
VDDSATA
VDDPCIEX
VDDCPU
VDDREF
VDD25
X1
X2
SDATA
SCLK
GNDPAD
GNDCPU
GNDPCIEX
GND96
GNDREF
GNDSATA
GND25
9LRS4105BKLFT/MLF32/X
CKVDD
CKBC1 1u/4/X5R/6.3V/K/X
CKBC2 1u/4/X5R/6.3V/K/X
CKFB1 30/4/4A/S/X
3VDUAL
CKBC3 1u/4/X5R/6.3V/K/X
CKBC4 1u/4/X5R/6.3V/K/X
CKBC5 1u/4/X5R/6.3V/K/X
CKBC6 0.1u/4/X7R/16V/K/X
CKBC7 1u/4/X5R/6.3V/K/X
CKC1 27p/4/NPO/50V/J/X
CKX1 14.318M/16p/20ppm/49US/40/D/X
CKC2 27p/4/NPO/50V/J/X
N_SMBDATA [7,8,12,14,15,16,19,27]
N_SMBCLK [7,8,12,14,15,16,19,27]
CKC4 100p/4/NPO/50V/J/X
CKC3 100p/4/NPO/50V/J/X
N_PCHCLK14 CKC5 10p/4/NPO/50V/J/X
PWOK PATCH
【技術通報R&D技術通報154】
VCC
R674 8.2K/4
PWOK [17,25]
R675 8.2K/4
[17] GP15
Q85 2N7002/SOT23/25pF/5
SOT23
R676 8.2K/4/X
ATXPG
VCC3
RN22 100/8P4R/6
RN23 100/8P4R/6
FIX PWR MINMUN LOAD
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CPU Frequency Selection

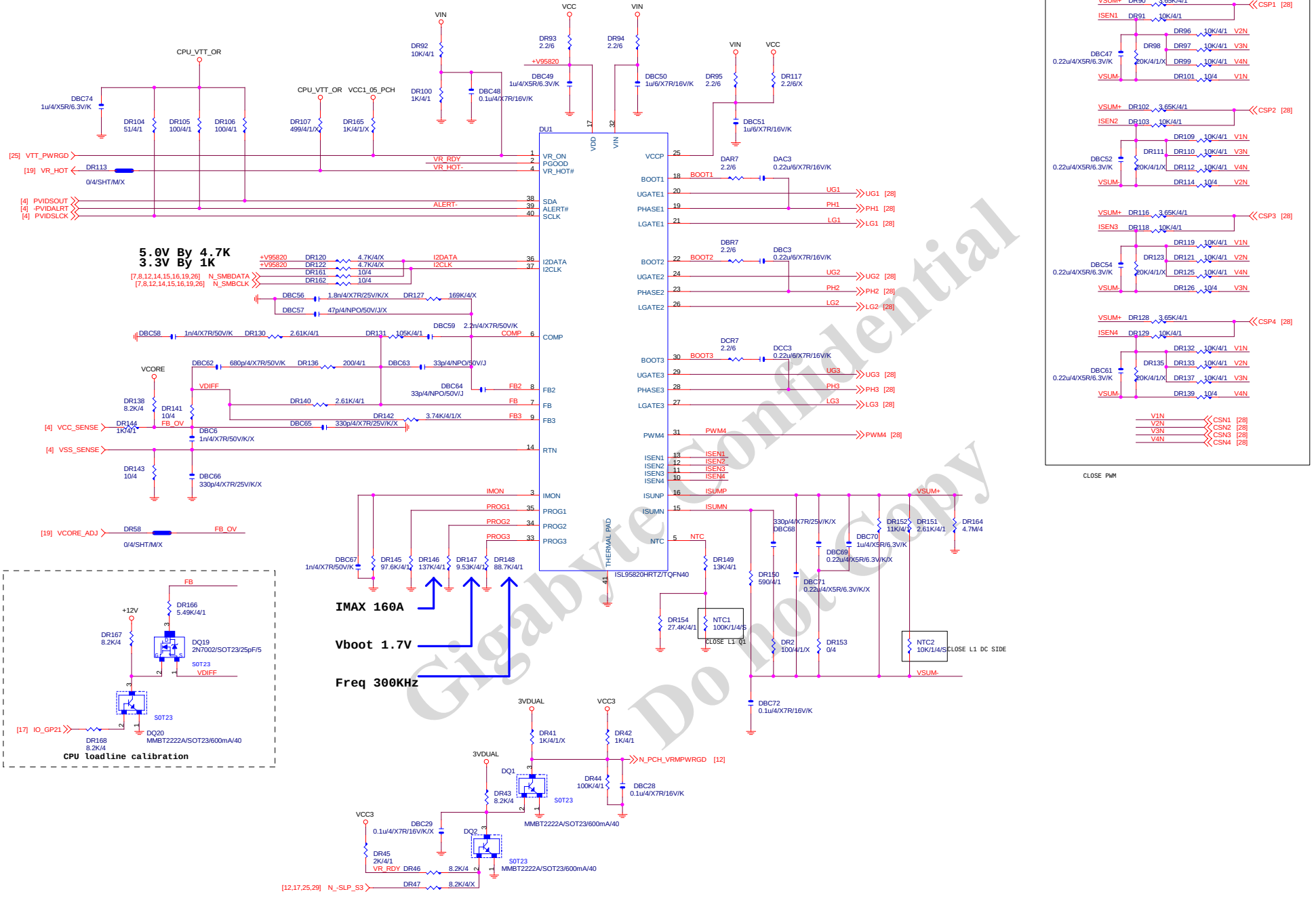
FSLB	FSLA	CPU
0	0	100M <Default>
0	1	133M
1	0	200M
1	1	166M

Gigabyte Technology

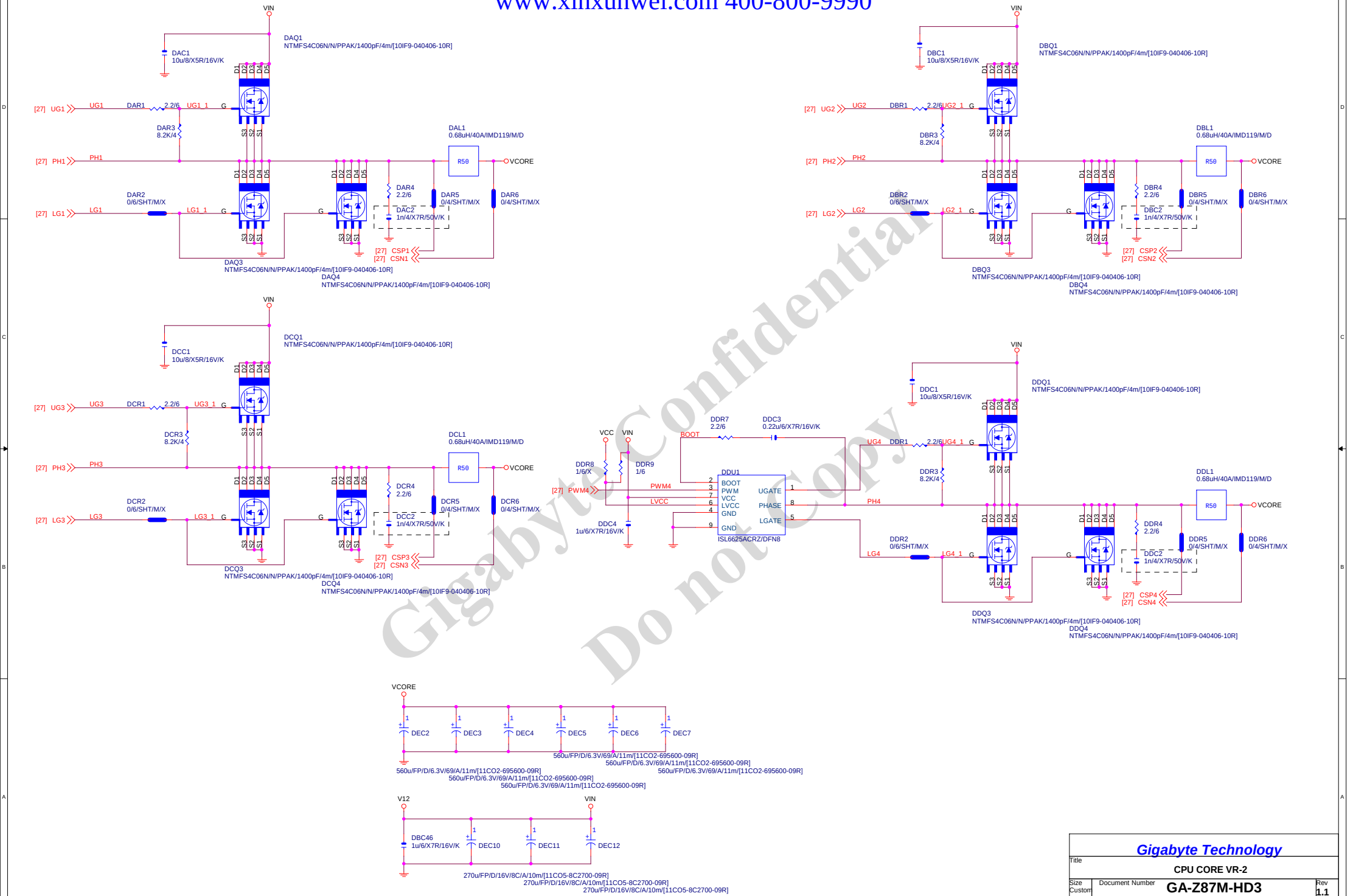
Title: ATX CONNECTOR

Size: Custom | Document Number: GA-Z87M-HD3 | Rev: 1.1

Date: Tuesday, July 23, 2013 | Sheet 26 of 32

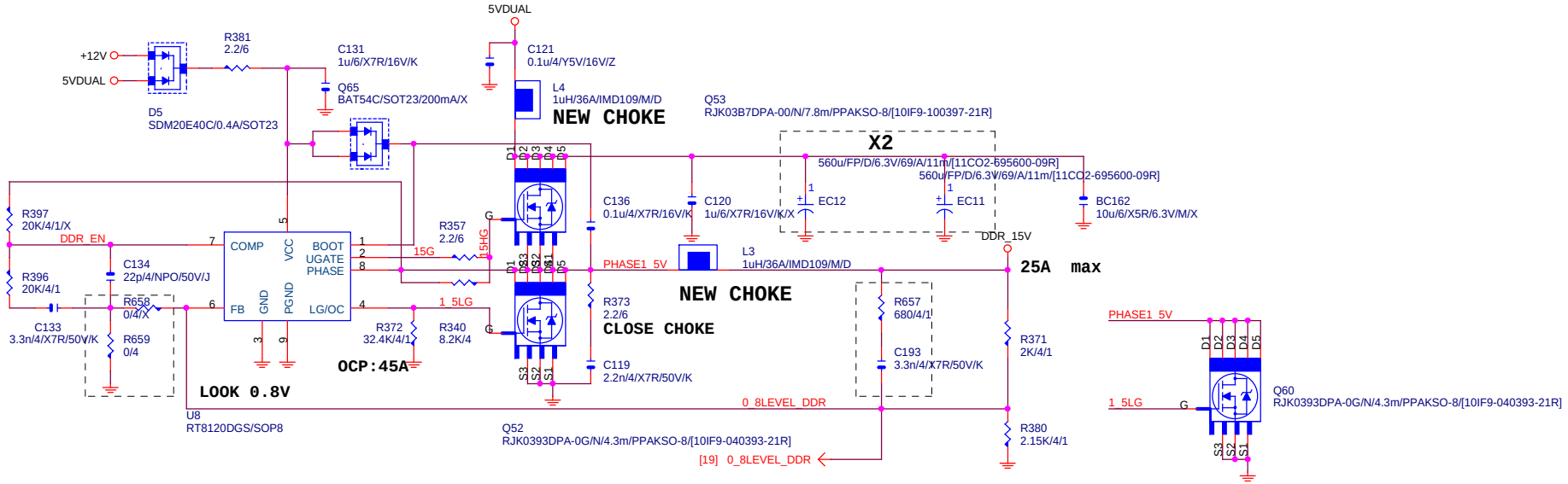


Gigabyte Technology			
Title	CPU CORE VR-1		
Size: Custom	Document Number: GA-Z87M-HD3		Rev: 1.1
Date: Tuesday, July 23, 2013	Sheet 27 of 32		

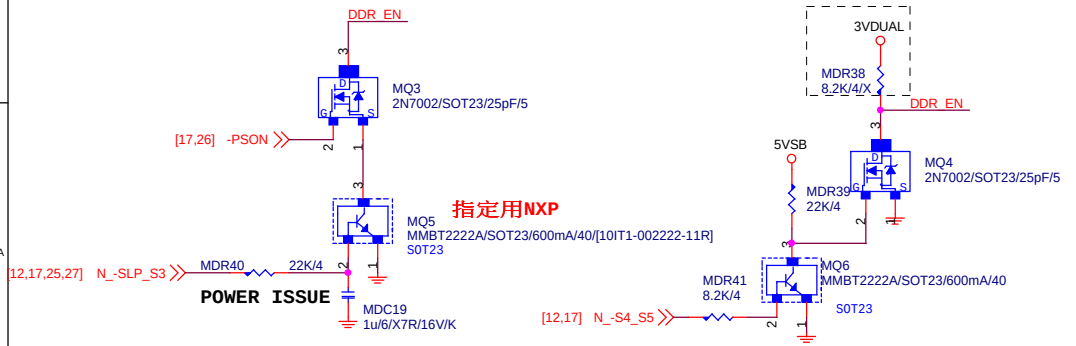


Gigabyte Technology			
Title: CPU CORE VR-2			
Size: Custom	Document Number: GA-Z87M-HD3		Rev: 1.1
Date: Tuesday, July 23, 2013		Sheet 28 of 32	

DDR15V



PWR SEQ



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

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

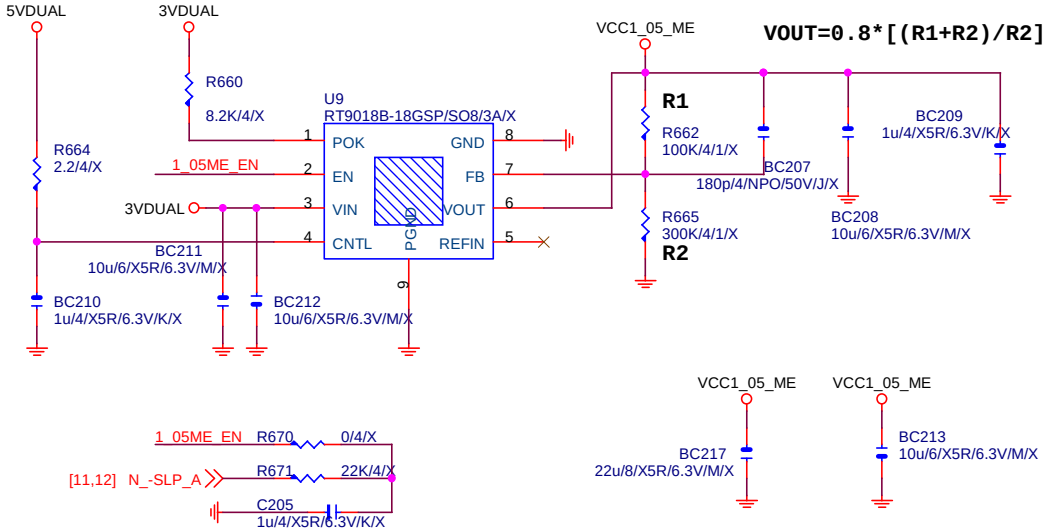
VIN Ripple current=4.7X1.7=7.99A(85℃)
-->故固態電容須2X7.99=15.98>11.45A

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

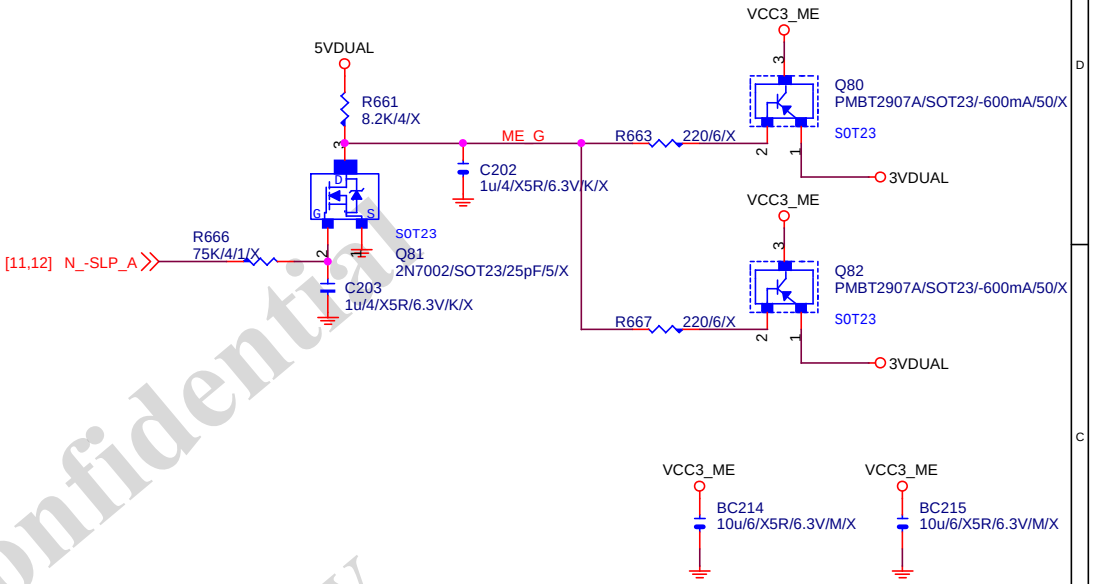
Gigabyte Technology			
Title: DDR POWER			
Size: Custom	Document Number: GA-Z87M-HD3		Rev: 1.1
Date: Tuesday, July 23, 2013	Sheet 29 of 32		

VCC1_05_ME

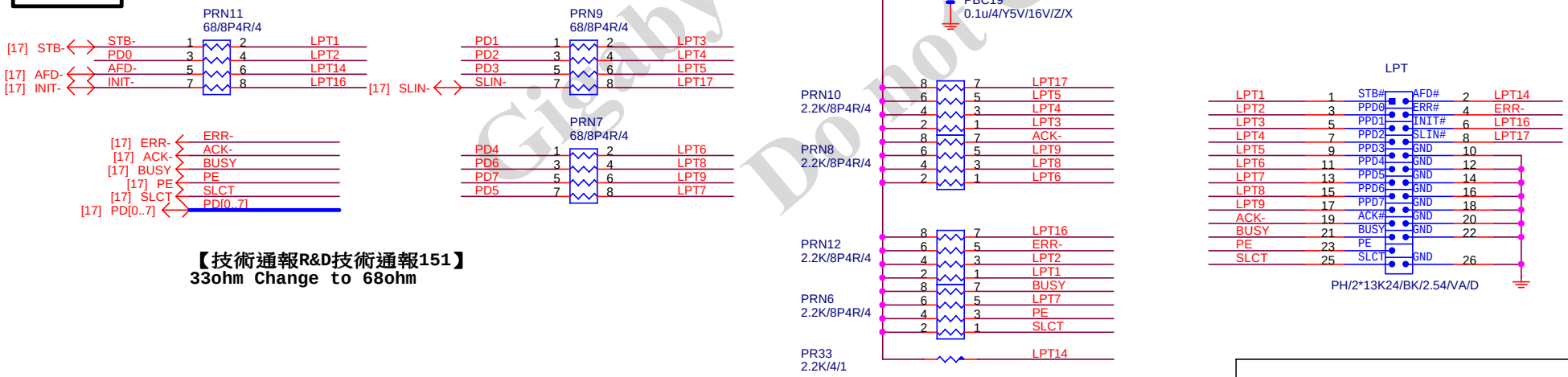
【技術通報R&D技術通報156】
(RICHTEK), (NUVOTON), (EMC)做共用
PIN7分壓阻值須做修改為100K以上電阻值



VCC3_ME



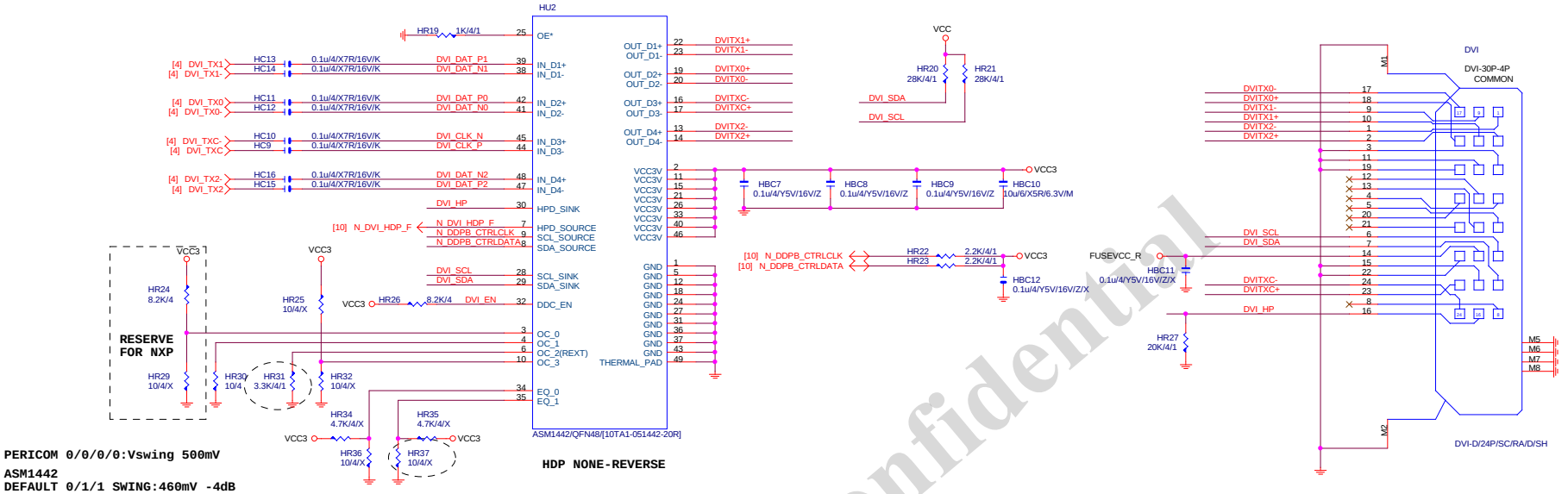
LPT PORT



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

Gigabyte Technology			
Title: LPT			
Size: Custom	Document Number: GA-Z87M-HD3		Rev: 1.1
Date: Tuesday, July 23, 2013	Sheet 30 of 32		

DVI LEVEL SHIFT

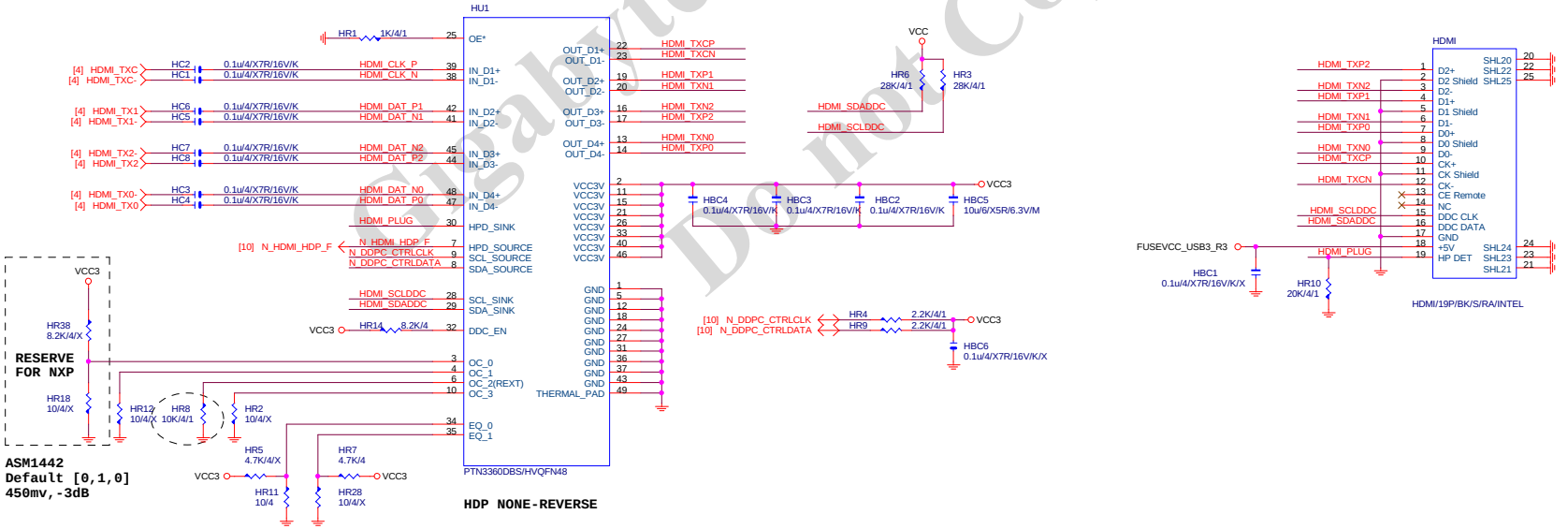


PERICOM 0/0/0/0:Vswing 500mV
ASM1442
DEFAULT 0/1/1 SWING:460mV -4dB

HDP NONE-REVERSE

PI3DV411 0 0:3dB
ASM1442 1 1:3dB

HDMI LEVEL SHIFT



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

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

HDP NONE-REVERSE

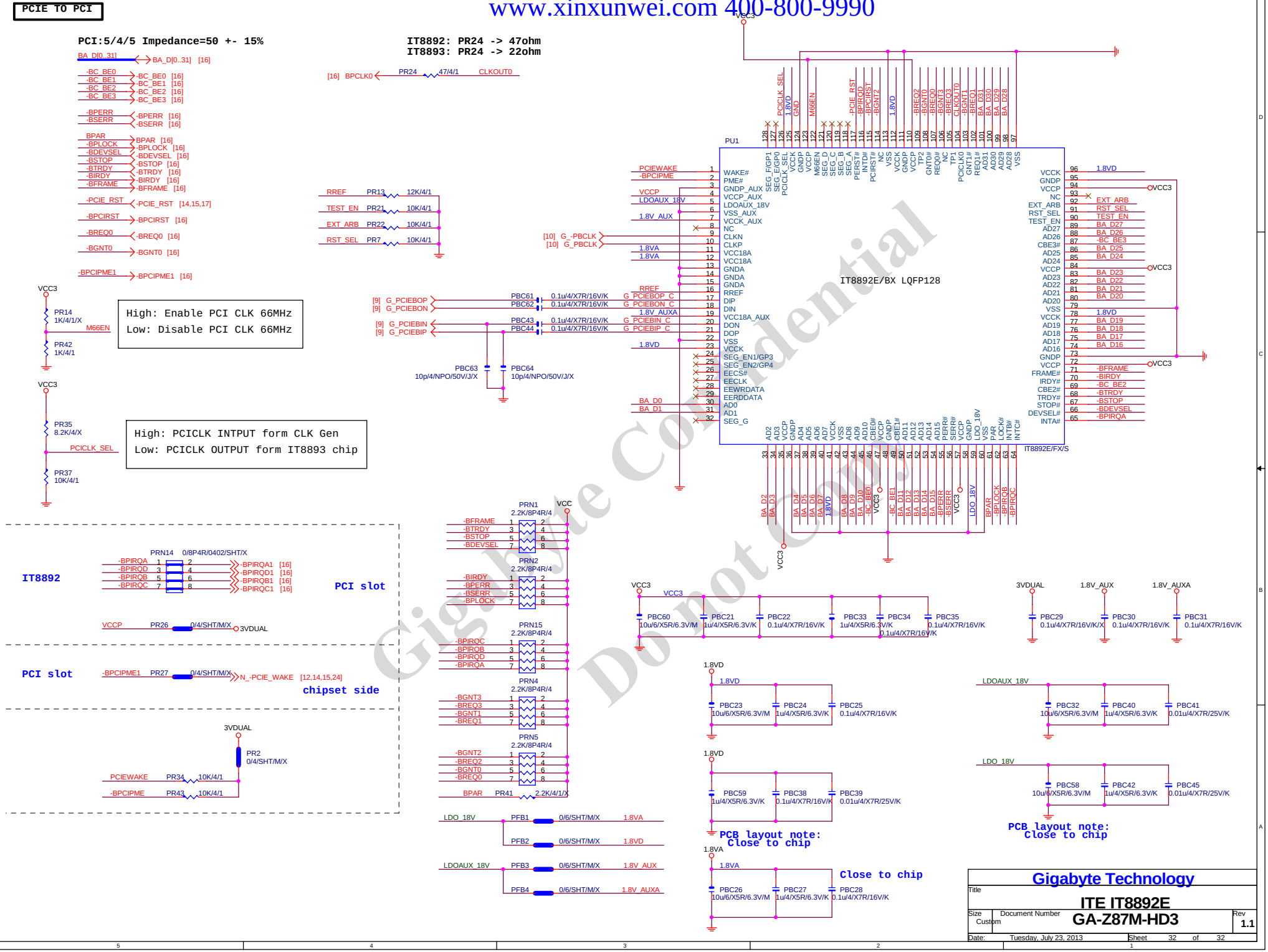
【技術通報R&D技術通報150】
HDMI eye diagram1.4版(deep color)會fail
原因: 因目前的HDMI訊號過長,造成RISING TIME過慢,而會壓到eye diagram
改善: ASMEDIA ASM1442 : 3.16K(PIN6 PULL DOWN電阻) 10ohm(PIN4 PULL DOWN電阻)

Gigabyte Technology		
Title: DVI		
Size: Custom	Document Number: GA-Z87M-HD3	Rev: 1.1
Date: Tuesday, July 23, 2013	Sheet 31 of 32	

PCIE TO PCI

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

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



Gigabyte Technology		
Title	ITE IT8892E	
Size: Custom	Document Number: GA-Z87M-HD3	Rev: 1.1
Date: Tuesday, July 23, 2013	Sheet 32 of 32	