Model Name: GA-H81M-D2V

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	PCI SLOT (NA)
17	ITE 8620 LPC IO
18	COM,KB_MS_USB,USB30_20
19	HWM,FAN CTRL,OV
20	DUAL BIOS
21	FP,FUSB,SPK,SATALED
22	Realtek ALC887-VD2
23	REAR AUDIO JACK
24	REALTEK RTL8111F
25	DISCRETE POWER
26	ATX
27	VCORE ISL95812_1

SHEET	TITLE
28	VCORE ISL95812_2
29	RT8120_DDR POWER
30	LPT
31	DVI
32	IT8892E (NA)
33	USB3 VL805

Gigabyte Technology

Title	Cover Sheet	
Size: Custom	Document Number: GA-H81M-D2V	Rev: 1.0
Date: Friday, July 12, 2013	Sheet 1 of 33	

Model Name: GA-H81M-D2V

Component value change history

2013/04/08

Data	Change Item	Reason
2013/05/15	New BOM	9MH81MD2V-00-01
2013/06/19 9MH81MD2V-00-01	*** 插件位置重覆 *** 新舊線路,元件值不同********** Old BOM LGA1150HASWELL/[10SC1-F01150-11R_10SC1-F01150-12R] New BOM LGA1150HASWELL/[10SC1-F01150-11R_10SC1-F01150-12R] LGA1150ILM_BP/1156/CSP/ILM_BP/1156/CSP/[12KRC-0F0001-52R_12KRC-0F0001-51R] *** 更換 *** 新舊線路中,元件值不同;共 6 個********** U1,'LM324DR/SO14變更爲'LM358DR/SO8 LAR13,'150/6變更爲'150/4/1 Q59,Q83,Q84,Q57,MMBT2222A/SOT23/600mA/40/[10IT1-002222-11R]變更爲MMBT2222A/SOT23/600mA/40 *** 增加 *** 只在新線路中,不在舊線路中;共 2 個********** FEC1,'100u/OS/D/16V/69/A/35m NC3,'22p/4/NPO/50V/J *** 刪除 *** 只在舊線路中,不在新線路中;共 2 個********** R364,'0/4 LGA1150_P,'ILM_BP/1156/CSP/ILM_BP/1156/CSP/[12KRC-0F0001-52R_12KRC-0F0001-51R]	

Circuit or PCB layout change

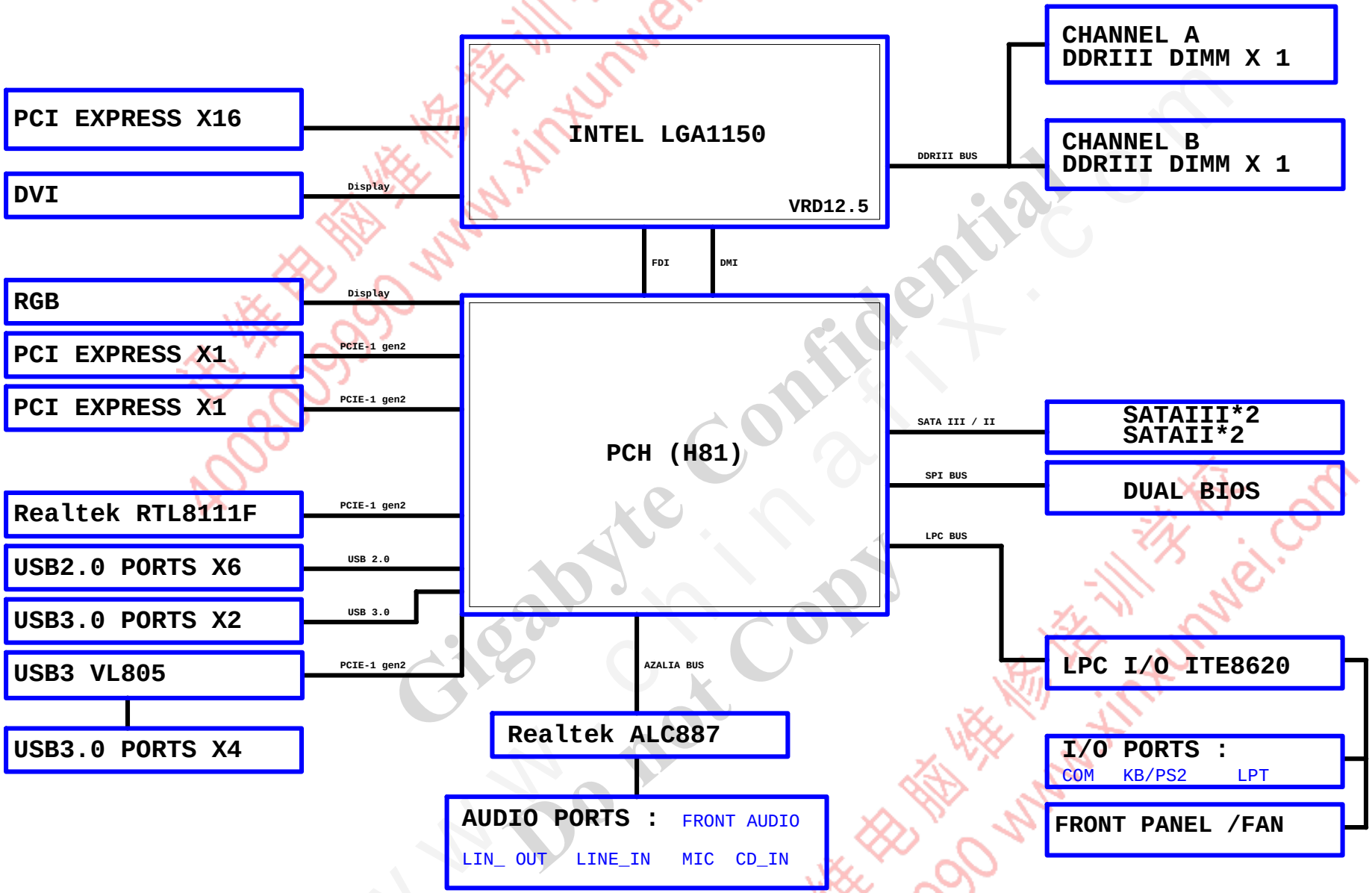
DATE	Change Item	Reason
2013/04/22	1.由B85M-HD3 Rev 1.0來修改 2.SIO change to IT8620 3.PWM change to ISL95812+6208 4.Delete 2 port SATA3 5.Add VL805 6.Delete HDMI 7.COM port change to rear 8.Delete PCI IT8892E 9.Fan control change to NCT3941S 10.SIO 統一命名O開頭	Rev 0.1
2013/05/23	1.U1 change to LM358	Rev 0.2
2013/06/27	1.PCH pin AD40 接到N_GPIO14 2.Add R394,請靠近R384&C132 3.Remove Q60 4.Add O_-RSMRST delay circuit	Rev 1.0

PCB : S4VNB (精成,全成信,伊利安達)
S:單文
4:四層板
V:第二層是VCC
N:咖啡色
B:製程

Gigabyte Technology

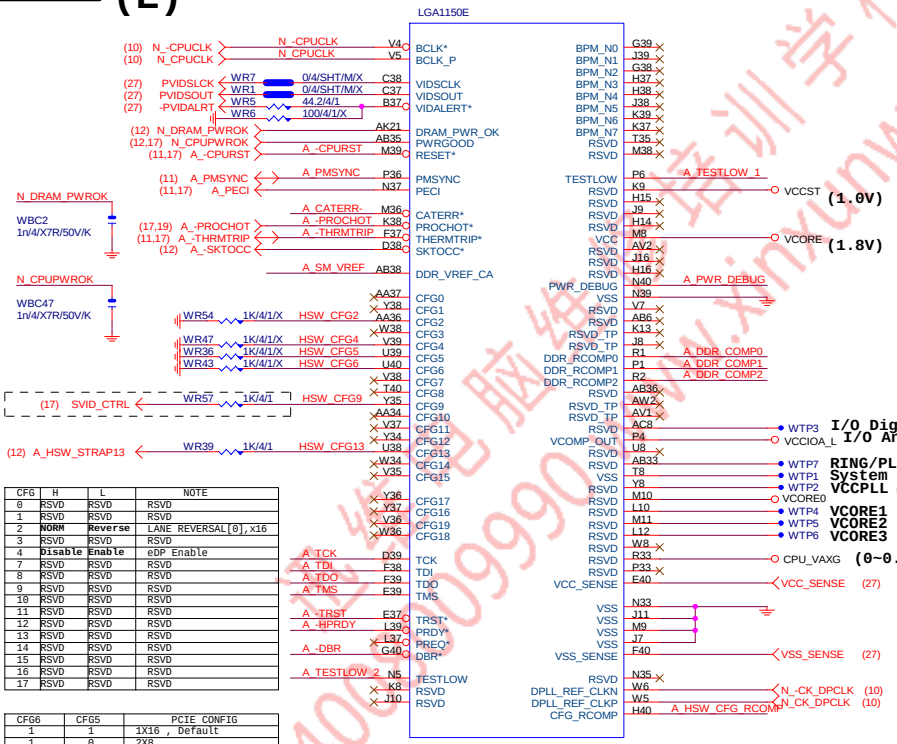
Title	BOM & PCB MODIFY HISTORY	
Size: Custom	Document Number: GA-H81M-D2V	Rev: 1.0
Date: Friday, July 12, 2013	Sheet 2 of 33	

BLOCK DIAGRAM



Gigabyte Technology		
Title: BLOCK DIAGRAM		
Size: C	Document Number: GA-H81M-D2V	Rev: 1.0
Date: Friday, July 12, 2013	Sheet 3 of 33	

LGA1150 (E)

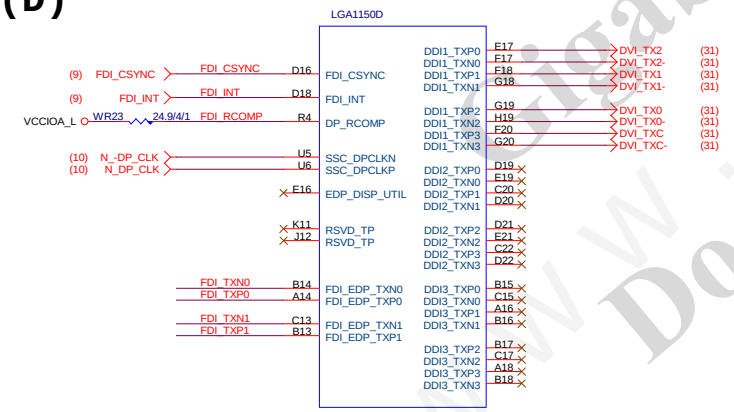


CFG	H	L	NOTE
0	RSVD	RSVD	RSVD
1	RSVD	RSVD	RSVD
2	**NORM**	**Reverse**	LANE REVERSAL[0],x16
3	RSVD	RSVD	RSVD
4	**Disable**	**Enable**	eDP Enable
7	RSVD	RSVD	RSVD
8	RSVD	RSVD	RSVD
9	RSVD	RSVD	RSVD
10	RSVD	RSVD	RSVD
11	RSVD	RSVD	RSVD
12	RSVD	RSVD	RSVD
13	RSVD	RSVD	RSVD
14	RSVD	RSVD	RSVD
15	RSVD	RSVD	RSVD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

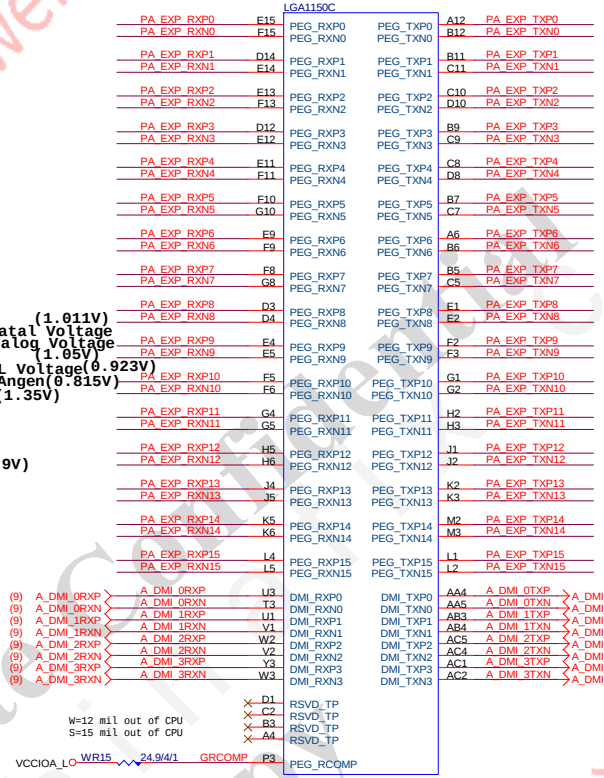


FDI:12/4/5/4/12(breakout min 6/4/4/4/6)
Impedance=85 +- 17.5%

FDI_TXP[0..1] FDI_TXP[0..1] (9)
FDI_TXN[0..1] FDI_TXN[0..1] (9)

LGA1155 (C)

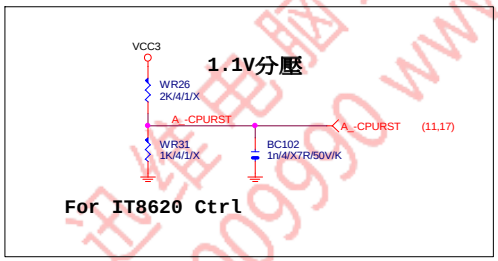
PCIEX16:16/5/5/5/16(breakout min 10/4/4/4/10)
Impedance=80 +- 17.5%



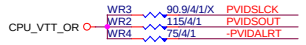
DMI:12/4/4/4/12(breakout min 8/4/4/4/8)
Impedance=85 +- 17.5%

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)

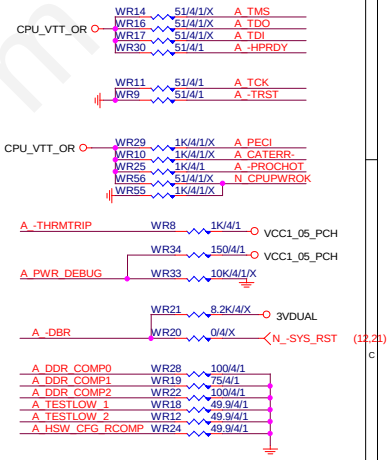
-CPURST



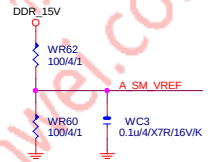
CPU SVID



CPU PU/PD



SM REF



Title	CPU LGA1150-A	
Size: Custom	Document Number: GA-H81M-D2V	Rev: 1.0
Date: Friday, July 12, 2013	Sheet 4 of 33	

Gigabyte Technology

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	MDA9
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			AM39	MDA21
MODT_A1	AY8	DDR0_ODT0	DDR0_DQ17	AP38	MDA18
	AW9	DDR0_ODT1	DDR0_DQ18	AP39	MDA19
	AU8	DDR0_ODT2	DDR0_DQ19	AM37	MDA20
		DDR0_ODT3	DDR0_DQ20	AM38	MDA16
			DDR0_DQ21	AP37	MDA22
			DDR0_DQ22	AP40	MDA23
	AW33	DDR0_ECC0	DDR0_DQ23	AV37	MDA25
	AV33	DDR0_ECC1	DDR0_DQ24	AW37	MDA29
	AU31	DDR0_ECC2	DDR0_DQ25	AU35	MDA26
	AV31	DDR0_ECC3	DDR0_DQ26	AV35	MDA27
	AT33	DDR0_ECC4	DDR0_DQ27	AT37	MDA28
	AU33	DDR0_ECC5	DDR0_DQ28	AU37	MDA24
	AT31	DDR0_ECC6	DDR0_DQ29	AT35	MDA30
	AW31	DDR0_ECC7	DDR0_DQ30	AW35	MDA31
			DDR0_DQ31	AY6	MDA33
(7) SBAA0	SBAA0 AV12	DDR0_BA0	DDR0_DQ32	AU6	MDA37
(7) SBAA1	SBAA1 AY11	DDR0_BA1	DDR0_DQ33	AV4	MDA34
(7) SBAA2	SBAA2 AT21	DDR0_BA2	DDR0_DQ34	AU4	MDA35
			DDR0_DQ35	AW6	MDA36
(7) CKEA0	CKEA0 AV22	DDR0_CKE0	DDR0_DQ36	AV6	MDA32
(7) CKEA1	CKEA1 AT23	DDR0_CKE1	DDR0_DQ37	AW4	MDA38
	AU22	DDR0_CKE2	DDR0_DQ38	AY4	MDA39
	AU23	DDR0_CKE3	DDR0_DQ39	AR1	MDA41
			DDR0_DQ40	AR4	MDA45
(7) -CSA0	-CSA0 AU14	DDR0_CS_N0	DDR0_DQ41	AN3	MDA42
(7) -CSA1	-CSA1 AV9	DDR0_CS_N1	DDR0_DQ42	AN4	MDA43
	AU10	DDR0_CS_N2	DDR0_DQ43	AR2	MDA44
	AW8	DDR0_CS_N3	DDR0_DQ44	AR3	MDA40
			DDR0_DQ45	AN2	MDA46
(7) DCLKA0	DCLKA0 AY15	DDR0_CLK_P0	DDR0_DQ46	AN1	MDA47
(7) -DCLKA0	-DCLKA0 AY16	DDR0_CLK_N0	DDR0_DQ47	AL1	MDA49
(7) DCLKA1	DCLKA1 AW15	DDR0_CLK_P1	DDR0_DQ48	AL4	MDA53
(7) -DCLKA1	-DCLKA1 AV15	DDR0_CLK_N1	DDR0_DQ49	AJ3	MDA50
	AY14	DDR0_CLK_P2	DDR0_DQ50	AJ4	MDA51
	AW14	DDR0_CLK_N2	DDR0_DQ51	AL2	MDA52
	AW13	DDR0_CLK_P3	DDR0_DQ52	AL3	MDA48
	AY13	DDR0_CLK_N3	DDR0_DQ53	AJ2	MDA54
			DDR0_DQ54	AJ1	MDA55
	AW12	RSVD	DDR0_DQ55	AG1	MDA57
			DDR0_DQ56	AG4	MDA61
			DDR0_DQ57	AE3	MDA58
			DDR0_DQ58	AE4	MDA59
			DDR0_DQ59	AG2	MDA60
			DDR0_DQ60	AG3	MDA56
			DDR0_DQ61	AE2	MDA62
(7) -SRASA	-SRASA AU12	DDR0_RAS*	DDR0_DQ62	AE1	MDA63
(7) -SWEA	-SWEA AU11	DDR0_WE*	DDR0_DQ63	AE39	DQSA0
	AY20	RSVD	DDR0_DQS_P0	AJ39	DQSA1
	AW27	RSVD	DDR0_DQS_P1	AN39	DQSA2
			DDR0_DQS_P2	AV36	DQSA3
(7) -SCASA	-SCASA AU9	DDR0_CAS*	DDR0_DQS_P3	AV5	DQSA4
			DDR0_DQS_P4	AP3	DQSA5
			DDR0_DQS_P5	AK3	DQSA6
			DDR0_DQS_P6	AE3	DQSA7
			DDR0_DQS_P7	AV32	
(7,8) -DDR3_RST	WR61 0/4/SHT/M/X AK22	DDR_RESET*	DDR0_DQS_P8	AE38	-DQSA0
			DDR0_DQS_N0	AJ38	-DQSA1
			DDR0_DQS_N1	AN38	-DQSA2
			DDR0_DQS_N2	AU36	-DQSA3
			DDR0_DQS_N3	AW5	-DQSA4
			DDR0_DQS_N4	AP2	-DQSA5
			DDR0_DQS_N5	AK2	-DQSA6
			DDR0_DQS_N6	AE2	-DQSA7
			DDR0_DQS_N7	AU32	
			DDR0_DQS_N8		

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

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

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_DQ17	AP34	MDB21
MODT_B1	AL16	DDR1_ODT0	DDR1_DQ18	AN31	MDB19
	AM16	DDR1_ODT1	DDR1_DQ19	AP31	MDB23
	AK15	DDR1_ODT2	DDR1_DQ20	AN35	MDB20
		DDR1_ODT3	DDR1_DQ21	AP35	MDB16
	AM26		DDR1_DQ22	AN32	MDB18
	AM25	DDR1_ECC0	DDR1_DQ23	AP32	MDB22
	AP25	DDR1_ECC1	DDR1_DQ24	AM29	MDB25
	AP26	DDR1_ECC2	DDR1_DQ25	AM28	MDB28
	AL26	DDR1_ECC3	DDR1_DQ26	AR29	MDB27
	AL25	DDR1_ECC4	DDR1_DQ27	AR28	MDB30
	AR26	DDR1_ECC5	DDR1_DQ28	AL29	MDB24
	AR25	DDR1_ECC6	DDR1_DQ29	AL28	MDB29
		DDR1_ECC7	DDR1_DQ30	AP29	MDB26
			DDR1_DQ31	AP28	MDB31
(8) SBAB0	SBAB0 AK17	DDR1_BA0	DDR1_DQ32	AR12	MDB32
(8) SBAB1	SBAB1 AL18	DDR1_BA1	DDR1_DQ33	AP12	MDB33
(8) SBAB2	SBAB2 AW28	DDR1_BA2	DDR1_DQ34	AL13	MDB34
			DDR1_DQ35	AL12	MDB35
(8) CKEB0	CKEB0 AW29	DDR1_CKE0	DDR1_DQ36	AR13	MDB36
(8) CKEB1	CKEB1 AY29	DDR1_CKE1	DDR1_DQ37	AP13	MDB37
	AU28	DDR1_CKE2	DDR1_DQ38	AM13	MDB38
	AU29	DDR1_CKE3	DDR1_DQ39	AM12	MDB39
			DDR1_DQ40	AR9	MDB45
(8) -CSB0	-CSB0 AP17	DDR1_CS_N0	DDR1_DQ41	AP9	MDB41
(8) -CSB1	-CSB1 AN15	DDR1_CS_N1	DDR1_DQ42	AR6	MDB47
	AN17	DDR1_CS_N2	DDR1_DQ43	AP6	MDB43
	AL15	DDR1_CS_N3	DDR1_DQ44	AR10	MDB44
			DDR1_DQ45	AP10	MDB40
			DDR1_DQ46	AR7	MDB46
			DDR1_DQ47	AP7	MDB42
(8) DCLKB0	DCLKB0 AM20	DDR1_CLK_P0	DDR1_DQ48	AM9	MDB52
(8) -DCLKB0	-DCLKB0 AM21	DDR1_CLK_N0	DDR1_DQ49	AL9	MDB53
(8) DCLKB1	DCLKB1 AP22	DDR1_CLK_P1	DDR1_DQ50	AL6	MDB50
(8) -DCLKB1	-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
(8) -SCASB	-SCASB AP16	DDR1_CAS*	DDR1_DQ58	AE6	MDB59
	AL20	RSVD	DDR1_DQ59	AE7	MDB63
(8) -SRASB	-SRASB AM18	DDR1_RAS*	DDR1_DQ60	AJ6	MDB56
(8) -SWEB	-SWEB AK16	DDR1_WE*	DDR1_DQ61	AJ7	MDB57
			DDR1_DQ62	AF6	MDB58
	VREF_DQA AB39		DDR1_DQ63	AF7	MDB62
(7) VREF_DQA	VREF_DQB AB40	DDR_VREF_DQ0	DDR1_DQS_P0	AE35	DQSB0
(8) VREF_DQB		DDR_VREF_DQ1	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	AP29	-DQSB3
			DDR1_DQS_N4	AN13	-DQSB4
			DDR1_DQS_N5	AR8	-DQSB5
			DDR1_DQS_N6	AM8	-DQSB6
			DDR1_DQS_N7	AG6	-DQSB7
			DDR1_DQS_N8	AN26	

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-F01150-11R_10SC1-F01150-12R]

LGA1150 (CR)

CR
CPU RETAINTION/X

LGA1150

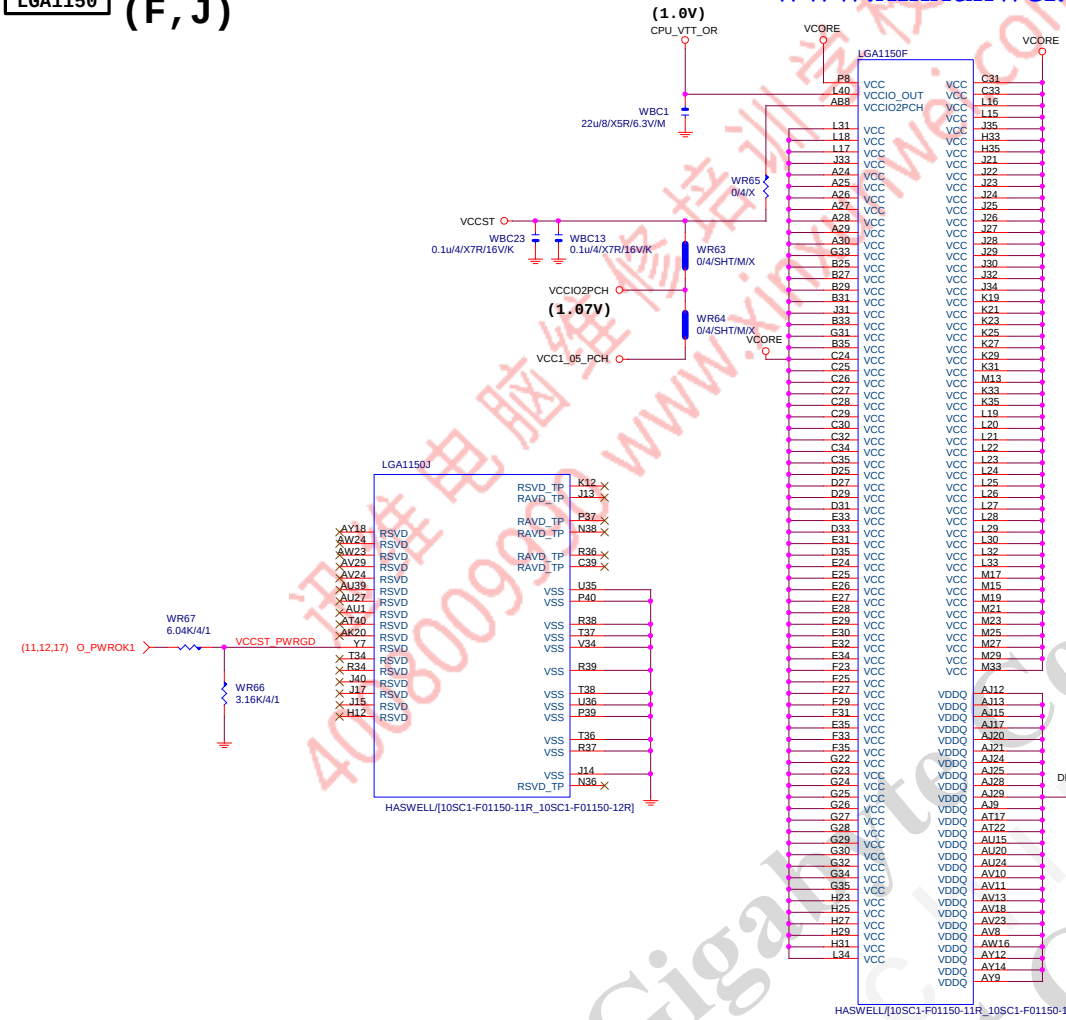
ILM_BP/1156/CSP/ILM_BP/1156/CSP/[12KRC-0F0001-52R_12KRC-0F0001-51R]

DDR BUS

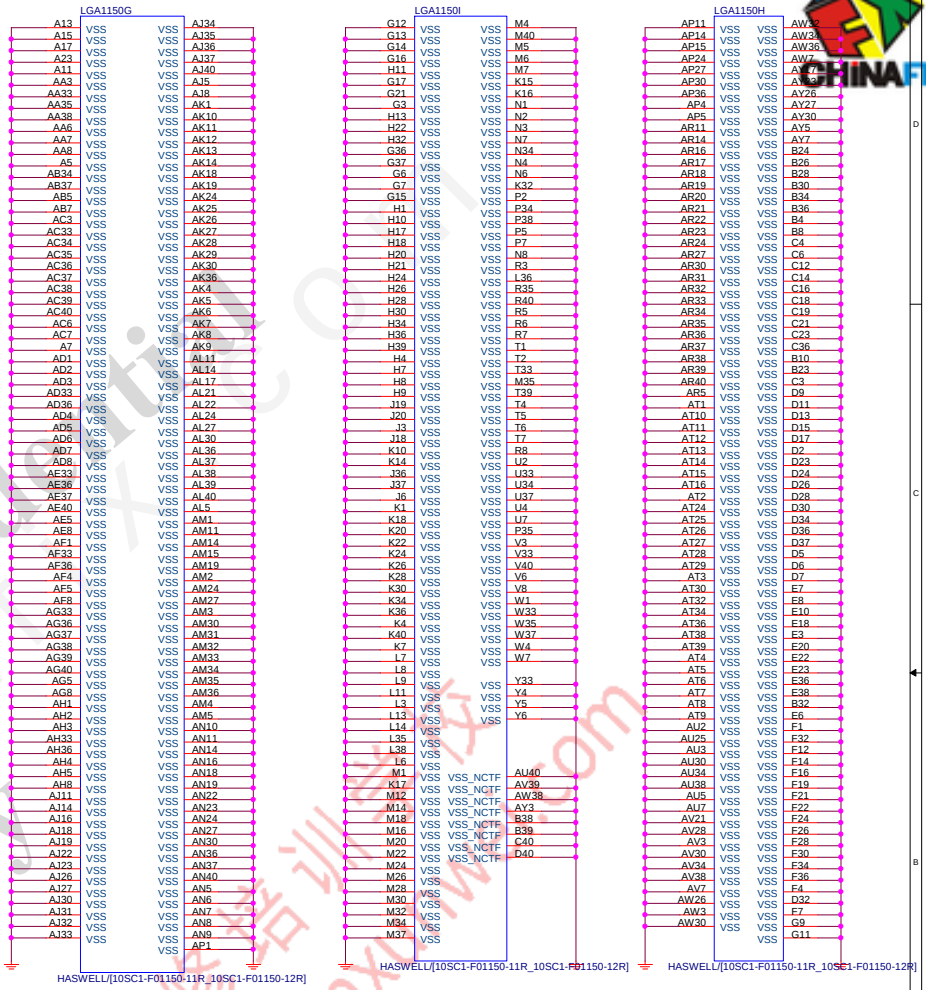
(7) MODT_A[0..1] — MODT_A[0..1]
(8) MODT_B[0..1] — MODT_B[0..1]
(7) MDA[0..63] — MDA[0..63]
(8) MDB[0..63] — MDB[0..63]
(7) DQSA[0..7] — DQSA[0..7]
(7) -DQSA[0..7] — -DQSA[0..7]
(7) MAAA[0..15] — MAAA[0..15]
(8) MAAB[0..15] — MAAB[0..15]
(8) DQSB[0..7] — DQSB[0..7]
(8) -DQSB[0..7] — -DQSB[0..7]

Gigabyte Technology	
Title	CPU LGA1150-B
Size: Custom	Document Number: GA-H81M-D2V
Rev	1.0
Date: Friday, July 12, 2013	Sheet 5 of 33

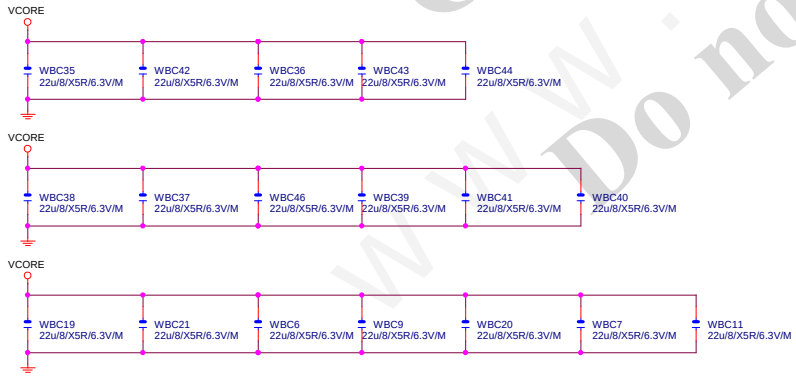
LGA1150 (F,J)



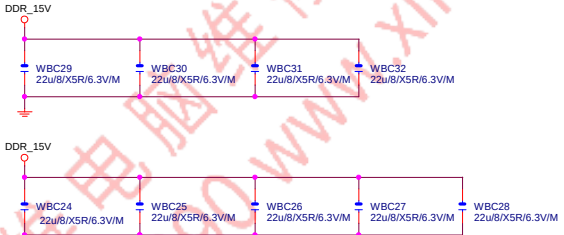
LGA1155 (G,H,I)



VCore CAP (X18)



DDR CAP (X9)



Gigabyte Technology			
Title	CPU LGA1150-C		
Size: Custom	Document Number: GA-H81M-D2V		Rev: 1.0
Date: Friday, July 12, 2013	Sheet 6 of 33		

DDR3 (A)

DDR3_1

DDRVTT
DDR_15V
VDDSPD_A
VDDSPD
VREFCA
VREFDQ
VCC3
N_SMBDATA
N_SMBCLK
MC10 100p/4/NPO/50V/J/X
MC11 100p/4/NPO/50V/J/X
MR17 0/4
MC4 0.1u/4/X7R/16V/K
MC5 VREF_DDRA
MC1 VREF_DQDDRA
0.1u/4/X7R/16V/K
MC6 100p/4/NPO/50V/J
-DDR3_RST

BLACK CONNECTOR
DDR3/240/BK/VA/D

MODT_A[0..1] MODT_A[0..1] (5)
-DQSA[0..7] -DQSA[0..7] (5)
DQSA[0..7] DQSA[0..7] (5)
MDA[0..63] (5)
MAAA[0..15] (5)

DDR3 VREF

DDR_15V
MR15 1K/4/1
MR14 1K/4/1
VREF_DDRA
MR4 1K/4/1
MR5 1K/4/1
VREF_DQDDRA
MR1 10/4
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/X7R/16V/K

Gigabyte Technology

Title: DDRIII CHANNEL A

Size: Custom | Document Number: GA-H81M-D2V | Rev: 1.0

Date: | Sheet 7 of 33

DDR3 (B)

DDR3_2

DDRVTT
DDR_15V
VDDSPD_B
MR18 0/4
MC2 0.1u/4/X7R/16V/K
MC14 0.1u/4/X7R/16V/K VREF_DDRB
MC9 0.1u/4/X7R/16V/K VREF_DDDRB

BLACK CONNECTOR

DDR3/240/BK/VA/D

DDR3_VREF

MR10 1K/4/1
MR11 1K/4/1
MR8 1K/4/1
MR9 1K/4/1
MR7 10/4
VREF_DDRB
VREF_DDDRB
VREF_DQB (5)

COUPON

COUPON1 COUPON1 1 2 COUPON/X
COUPON2 COUPON2 1 2 COUPON/X

CPU

DIMM4
DIMM2
CHA
DIMM3
DIMM1
CHB

Gigabyte Technology

Title	DDRIII CHANNEL B
Size / Document Number	Custom / GA-H81M-D2V
Rev	1.0
Date:	Sheet 8 of 33

PCH (B)

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

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

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

PCHB

DMI_RXN_0 DMI_RXP_0 DMI_TXN_0 DMI_TXP_0 DMI_RXN_1 DMI_RXP_1 DMI_TXN_1 DMI_TXP_1 DMI_RXN_2 DMI_RXP_2 DMI_TXN_2 DMI_TXP_2 DMI_RXN_3 DMI_RXP_3 DMI_TXN_3 DMI_TXP_3 DMI_RCOMP PCIE_RCOMP CLKIN_DMI_N CLKIN_DMI_P

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

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

N_-USBP0 (21) N_+USBP0 (21) N_-USBP1 (21) N_+USBP1 (21)
N_-USBP4 (18) N_+USBP4 (18) N_-USBP5 (18) N_+USBP5 (18)
H81: Port 6/7/12/13 N/A
N_-USBP8 (21) N_+USBP8 (21) N_-USBP9 (21) N_+USBP9 (21) N_-USBP10 (21) N_+USBP10 (21) N_-USBP11 (21) N_+USBP11 (21)
H81: Port 6/7/12/13 N/A

W=4 mil out of PCH
S=15 mil out of PCH
VCC1_5_PCH — NR50 7.5K/4/1 DMI_COMP B19 — PCIE_COMP C13 — NR40 7.5K/4/1
CK_-SRCCLK_PCH G22
CK_SRCCLK_PCH F22

PCIE Only

PCIE_PERN_1_USB3_RXN_2 PCIE_PERP_1_USB3_RXP_2 PCIE_PETN_1_USB3_TXN_2 PCIE_PETP_1_USB3_TXP_2 PCIE_PERN_2_USB3_RXN_3 PCIE_PERP_2_USB3_RXP_3 PCIE_PETN_2_USB3_TXN_3 PCIE_PETP_2_USB3_TXP_3 PCIE_PERN_3 PCIE_PERP_3 PCIE_PETN_3 PCIE_PETP_3 PCIE_PERN_4 PCIE_PERP_4 PCIE_PETN_4 PCIE_PETP_4 PCIE_PERN_5 PCIE_PERP_5 PCIE_PETN_5 PCIE_PETP_5 PCIE_PERN_6 PCIE_PERP_6 PCIE_PETN_6 PCIE_PETP_6 PCIE_PERN_7 PCIE_PERP_7 PCIE_PETN_7 PCIE_PETP_7 PCIE_PERN_8 PCIE_PERP_8 PCIE_PETN_8 PCIE_PETP_8

L14 K14 B12 B11 F14 G14 D11 C11 F11 H11 B9 A9 J11 L11 B8 C8 G9 F9 B7 A7 F7 H7 E1 D2 K6 K8 G3 G5 J2 J3 H2 H1

OC0B_GP59 OC1B_GP40 OC2B_GP41 OC3B_GP42 OC4B_GP43 OC5B_GP9 OC6B_GP10 OC7B_GP14

AE40 AF37 AD39 AD40 AF39 AC41 AF40 AG40 N_GPIO14
N_-USBOC_F (18,21)
N_-USBOC_R (18)

USBRBIASB AV20 N_USBRBIAS NR47 22.6/4/1 AU20 USBRBIAS

CLKIN_DOT96N AP11 CK_-DOTCLK
CLKIN_DOT96P AM11 CK_DOTCLK

8111G: (24) LA_ML_IN (24) LA_ML_IP (24) LA_ML_ON (24) LA_ML_OP
vl805: (33) USB3_IN1 (33) USB3_IP1 (33) USB3_ON1 (33) USB3_OP1
PCIEx1: (15) PI_PCIEX1_IN (15) PI_PCIEX1_IP (15) PI_PCIEX1_ON (15) PI_PCIEX1_OP (15) PJ_PCIEX1_IN (15) PJ_PCIEX1_IP (15) PJ_PCIEX1_ON (15) PJ_PCIEX1_OP

N/A

NR130 8.2K/4 — N_GPIO14 — 3VDUAL
N_-USBOC_F — NBC82 0.1u/4/X7R/16V/K
N_-USBOC_R — NBC83 0.1u/4/X7R/16V/K

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

H81/S

PCH (F)

PCHF

(21) PCH_USB3_RXN0 (21) PCH_USB3_RXP0 (21) PCH_USB3_TXN0 (21) PCH_USB3_TXP0
(21) PCH_USB3_RXN1 (21) PCH_USB3_RXP1 (21) PCH_USB3_TXN1 (21) PCH_USB3_TXP1

USB3: F20 G20 B18 C18 G18 H18 B15 B16
FDILINK: N1 FDI_TXN0, N2 FDI_TXP0, P2 FDI_TXN1, P3 FDI_TXP1

USB3_RXN_0 USB3_RXP_0 USB3_TXN_0 USB3_TXP_0 USB3_RXN_1 USB3_RXP_1 USB3_TXN_1 USB3_TXP_1
FDI_RXN_0 FDI_RXP_0 FDI_RXN_1 FDI_RXP_1

FDI_CSYNC L2 — FDI_CSYNC (4)
FDI_INT L3 — FDI_INT (4)
FDI_RCOMP K2 — NR29 7.5K/4/1 — VCC1_5_PCH

N/A
USB3_RXN_4 K20, USB3_RXP_4 L20, USB3_TXN_4 D15, USB3_TXP_4 C15
USB3_RXN_5 L18, USB3_RXP_5 K18, USB3_TXN_5 B14, USB3_TXP_5 A14

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

H81/S
FDI_TXP[0..1] (4)
FDI_TXN[0..1] (4)

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

PCH CLK PD

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

CK_DOTCLK NR92 8.2K/4
CK_-DOTCLK NR91 8.2K/4
NR225 short to GND in non graphic SKU

PCH (J)

PCHJ

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

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

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

VSS AC31
VSS AF3
VSS AV21

H81/S

PCH H/S

LOW COST ICH7 HEATSINK

SB_HEATSIN
1
2
GRAY HS

PCH_HS
PCH_HS/[12SP2-030005-41R]

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#	USB_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-H81M-D2V | Rev: 1.0
Date: Friday, July 12, 2013 | Sheet 9 of 33

PCH (E)

PCHE

(31) N_DVI_HDP_F

AJ2 AH5 AJ4 — DDPB_HPD DDPC_HPD DDPD_HPD
AK6 AK8 AG7 AG6 AG11 AG10 — DDPB_AUXN DDPB_AUXP DDPC_AUXN DDPC_AUXP DDPD_AUXN DDPD_AUXP
DDPC_CTRLDATA DDPB_CTRLCLK DDPB_CTRLDATA DDPD_CTRLCLK DDPD_CTRLDATA

VGA_HSYNC AH3 — H_SYNC — NR26 33/4 — N_GHSYNC
VGA_VSYNC AH2 — V_SYNC — NR33 33/4 — N_GVSYNC
VGA_RED AC2 — N_R
VGA_GREEN AE2 — N_G
VGA_BLUE AC3 — N_B
VGA_IRTN AG4
VGA_DDC_DATA AL3 — N_DDCDATA
VGA_DDC_CLK AL2 — N_DDCCLK
DAC_IREF AE5 — N_VGA_RSET — NR34 649/4/1
AN3 AM2 AM1 AJ5 AN4 AN2 — N_DDPB_CTRLCLK N_DDPB_CTRLDATA

N_DDPB_CTRLCLK (31)
N_DDPB_CTRLDATA (31)

H81/S

PCH (G)

PCHG

(17) N_LPC33 — NR37 33/4 — N_LPC33Z0 — AV5 CLKOUT_33MHZ0
(11) N_PCH33 — NR38 33/4 — N_PCH33Z1 — AV7 CLKOUT_33MHZ1
AU2 CLKOUT_33MHZ2
AN9 CLKOUT_33MHZ3
AU5 CLKOUT_33MHZ4

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

(17) O_LPCCLK48 — NR39 33/4 — N_PCH_48M — AV8 AT9 AV9 AU8 CLKOUTFLEX0_GP64 CLKOUTFLEX1_GP65 CLKOUTFLEX2_GP66 CLKOUTFLEX3_GP67

VCC1_5_PCH — NR18 7.5K/4/1 — N_CLK_RCOMP — R11 DIFFCLK_BIASREF
N_PCHCLK14 — AR7 REFCLK14IN

CLKIN_GND0_N G16 — N_-CLK_GND
CLKIN_GND0_P F16 — N_CLK_GND

CLKOUT_DMI_N R2 — N_-CPUCLK (4)
CLKOUT_DMI_P T2 — N_CPUCLK (4)

CLKOUT_DP_N T3 — N_-DP_CLK (4)
CLKOUT_DP_P T5 — N_DP_CLK (4)

CLKOUT_DPNS_N W2 — N_-CK_DPCLK (4)
CLKOUT_DPNS_P U2 — N_CK_DPCLK (4)

CLKOUT_ITPXDP_N U6
CLKOUT_ITPXDP_P U7

CLKOUT_PEG_A_N AA3 — PA_-SRCCLK_3GIO (14)
CLKOUT_PEG_A_P AA2 — PA_SRCCLK_3GIO (14) — PCIEx16

CLKOUT_PEG_B_N AE6
CLKOUT_PEG_B_P AE7

CLKOUT_PCIE_N_0 AE10 — PI_-PCIE_CLK (15)
CLKOUT_PCIE_P_0 AE11 — PI_PCIE_CLK (15) — PCIEx1

CLKOUT_PCIE_N_1 AC6
CLKOUT_PCIE_P_1 AC7

CLKOUT_PCIE_N_2 AC11 — LA_-SRCCLK_LAN (24)
CLKOUT_PCIE_P_2 AC10 — LA_SRCCLK_LAN (24) — 8111F

CLKOUT_PCIE_N_3 W11
CLKOUT_PCIE_P_3 W10

CLKOUT_PCIE_N_4 Y4
CLKOUT_PCIE_P_4 Y2

CLKOUT_PCIE_N_5 W7 — PJ_-PCIE_CLK (15)
CLKOUT_PCIE_P_5 W6 — PJ_PCIE_CLK (15) — PCIEx1

CLKOUT_PCIE_N_6 AA7 — SRCCLK_USB3 (33)
CLKOUT_PCIE_P_6 AA6 — SRCCLK_USB3 (33) — VL805

CLKOUT_PCIE_N_7 R6
CLKOUT_PCIE_P_7 R7

Rev 0.2
O_LPCCLK48
NC3 22p/4/NPO/50V/J

N_XTALI_PCH — NR15 1M/4
NX1 — N_XTALO_PCH
25M/20p/30ppm/49US/20/D
NC8 27p/4/NPO/50V/J
NC7 27p/4/NPO/50V/J
N_XTALO_PCH — N7 XTAL25_OUT
N_XTALI_PCH — N6 XTAL25_IN

H81/S

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

PCH CLK PD

N_-CLK_GND — NR42 8.2K/4
N_CLK_GND — NR41 8.2K/4

Mount for integrated clock Generation Mode

N_PCHCLK14 — NR118 8.2K/4

VGA DDC

VCC3
R146 2.2K/4/1
R147 2.2K/4/1
N_DDCDATA
N_DDCCLK

VCC — NR35 1K/4/1 — Q47 2N7002/SOT23/25pF/5 — R144 2.2K/4/1 — R145 2.2K/4/1 — VGADDCDATA
VCC — NR36 1K/4/1 — Q48 2N7002/SOT23/25pF/5 — VGADDCCLK
SOT23

VCC
N_GVSYNC — C31 100p/4/NPO/50V/J/X
N_GHSYNC — C32 100p/4/NPO/50V/J/X

VGA CONNECTOR

FUSEVCC_R
BC63 0.1u/4/X7R/16V/K/X
VGA
VGA_R
VGA_G
VGA_B
VGADDCDATA
N_GHSYNC
N_GVSYNC
VGADDCCLK
VGA/BK/SC/RA/D/2/HR

BLACK CONNECTOR

VGA ESD

ESD3
VGADDCDATA — VGADDCCLK
N_GHSYNC — N_GVSYNC
VCC
C33 0.1u/4/X7R/16V/K
AZC099-04S/SOT23-6L

SSOP6_ESD

ESD4
VGA_R
VGA_G — VGA_B
VCC3
C40 0.1u/4/X7R/16V/K
AZC099-04S/SOT23-6L

VGA DDC

N_R
N_G
N_B
FB1 FB2 FB3 — 60/4/3A/S
VGA_R
VGA_G
VGA_B
R152 75/4/1
R150 75/4/1
R151 75/4/1
C35
C34 10p/4/NPO/50V/J
C36 10p/4/NPO/50V/J
C37 22p/4/NPO/50V/J
C38 22p/4/NPO/50V/J
C39 22p/4/NPO/50V/J

Close to Filter

Gigabyte Technology

Title: PCH DISPLAY ,CLK BUFFER

Size: Custom | Document Number: GA-H81M-D2V | Rev: 1.0

Date: Friday, July 12, 2013 | Sheet 10 of 33

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

(6,12,17) O_PWROK1 — NR177 0/4 — N_ME_PWROK — AA32 APWROK
NC26 100p/4/NPO/50V/J/X

CLINK: CL_CLK (U36), CL_DATA (U35), CL_RSTB (U34)

FAN: PWM0 (AL31), PWM1 (AM31), PWM2 (AP31), PWM3 (AV30)

GPIO:
- TACH0_GP17 (AP28) — N_GPIO17
- TACH1_GP1 (AT31) — (18) N_GPIO1
- TACH2_GP6 (AM28) — N_GPIO6
- TACH3_GP7 (AV34) — N_GPIO7
- TACH4_GP68 (AT30) — N_GPIO68
- TACH5_GP69 (AV35) — N_GPIO69
- SSTCTL (AJ31) — (17) N_SSTCTL
- SCLOCK_GP22 (L38) — N_GPIO22
- SLOAD_GP38 (H41) — N_GPIO38
- SDATAOUT0_GP39 (R31) — N_GPIO39
- SDATAOUT1_GP48 (L40) — N_GPIO48

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 (21)
SATA_RCOMP D33 — SATA3COMP — NR68 7.5K/4/1 — VCC1_5_PCH

SATA0GP_GP21 M37 N_GPIO21 — N_GPIO21 (26)
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

HOST:
- RSVD N30 — N_A20GATE — N_A20GATE (17)
- RCINB K36 — N_-KBRST — N_-KBRST (17)
- SERIRQ G39 — N_SERIRQ — N_SERIRQ (17)
- THRMTRIPB C40 — A_-THRMTRIP — SB_PECI NR85 0/4/X A_PECI — A_-THRMTRIP (4,17)
- PECI F40 — A_PECI (4,17)
- PM_SYNCH F41 — A_PMSYNC (4)
- PLTRST_PROCB — A_-CPURST (4,17)

H81/S

PCH (A)

3VDUAL_PCH — NR124 8.2K/4/X N_-P_PME — AA31 PMEB
(10) N_PCH33 — N_PCH33 — AM22 CLKIN_33MHZLOOPBACK
PLTRSTB — AA37 — N_-PFMRST (17)
GP35/NMIB — M40 N_GPIO35
GP50 — AH26 N_GPIO50
GP51 — AU31 N_GPIO51
GP52 — AJ26 N_GPIO52
GP53 — AV31 N_GPIO53
GP54 — AW33 N_GPIO54
GP55 — R30 N_GPIO55

TP16 A2
TP17 A3
TP18 B2
TP19 B1
TD_IREF C3 — NR30 8.2K/4 TD_IREF

PIRQAB — N_-PIRQA AU29
PIRQB — N_-PIRQB AU27
PIRQCB — N_-PIRQC AW28
PIRQDB — N_-PIRQD AV27

GPIO2 — N_-PIRQE AR30
GPIO3 — N_-PIRQF AV29
GPIO4 — N_-PIRQG AV28
GPIO5 — N_-PIRQH AT27

H81/S

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
- N_SERIRQ 7 8

NRN12 8.2K/8P4R/4
- N_GPIO38 1 2
- N_GPIO19 3 4
- N_GPIO22 5 6
- N_GPIO49 7 8

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

NRN13 8.2K/8P4R/4
- N_-PCI_STOP 1 2
- N_A20GATE 3 4
- N_GPIO39 5 6
- N_-KBRST 7 8

(12) PCH CONFIG — N_-PCI_STOP
NR157 1K/4/1/X
GFX SELECT — NR161 1K/4/1
DMI RX TERMINATION — 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

SATA3_0
SATA2/7/WH/H/OP/VA/D/1/B/PA66
WHITE 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_1
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

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

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

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

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

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

SATA2_3
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

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

ME PWROK

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

Gigabyte Technology

Title	PCH HOST , SATA, PCI	
Size: Custom	Document Number: GA-H81M-D2V	Rev: 1.0
Date: Friday, July 12, 2013	Sheet 11 of 33	

PCH (D)

PCHD

H81/S

ACZ_SDOUT

SPI OVERRIDE PROTECTION

PCH_DPWROK

PCH PU/PD

HSW_STRAP13

32.768KHZ

CLR_CMOS

BATTERY-DUAL-4

RB 必须放在BAT外

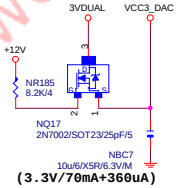
Title	PCH GPIO , CTRL , AUDIO
Size	Custom
Document Number	GA-H81M-D2V
Rev	1.0
Date:	Friday, July 12, 2013
Sheet	12 of 33

Gigabyte Technology

PCH (H)

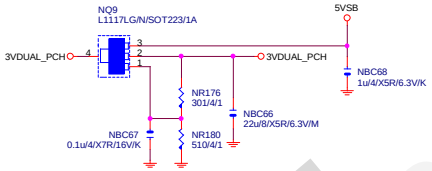
VCC3_DAC

CLOSE北桥(注意震盪水波紋)



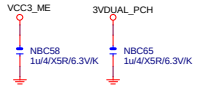
(3.3V/70mA+360uA)

3VDUAL_PCH

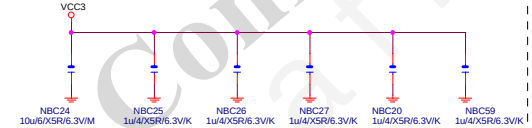


SHT PWR

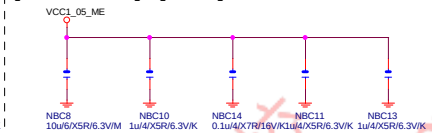
CAP



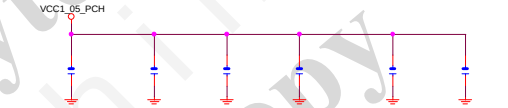
(3.3V)(X6)



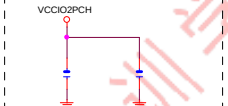
(1.05V)(X5)



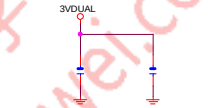
(1.05V)(X6)



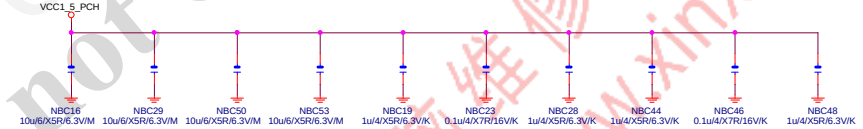
(1.05V)(X2)



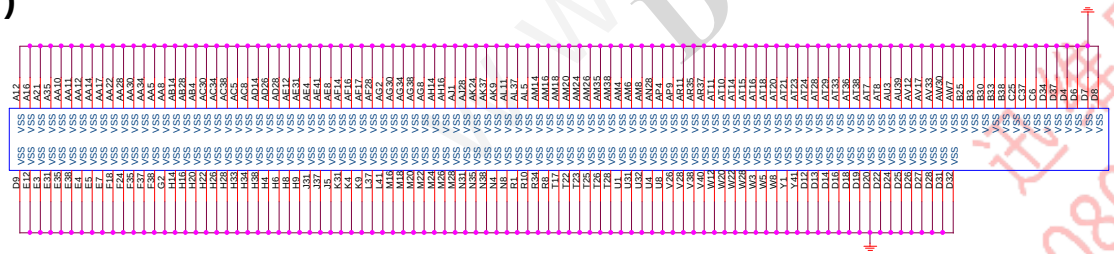
(3.3V)(X2)



(1.05V)(X10)



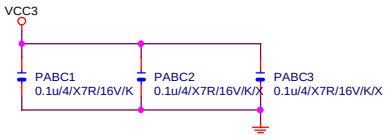
PCH (I)



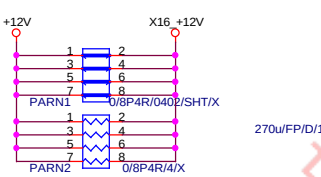
Title	PCH PWR ,GND
Size / Custom	Document Number: GA-H81M-D2V
Rev	1.0
Date:	Friday, July 12, 2013
Sheet	13 of 33

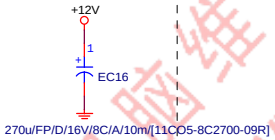
Gigabyte Technology

PCIEX16 CAP



PCIEX16 PROTECT SHT





PCIEX16 AC CAP

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

PA_EXP_RXP[0..15] >> PA_EXP_RXP[0..15] (4)

PA_EXP_RXN[0..15] >> PA_EXP_RXN[0..15] (4)

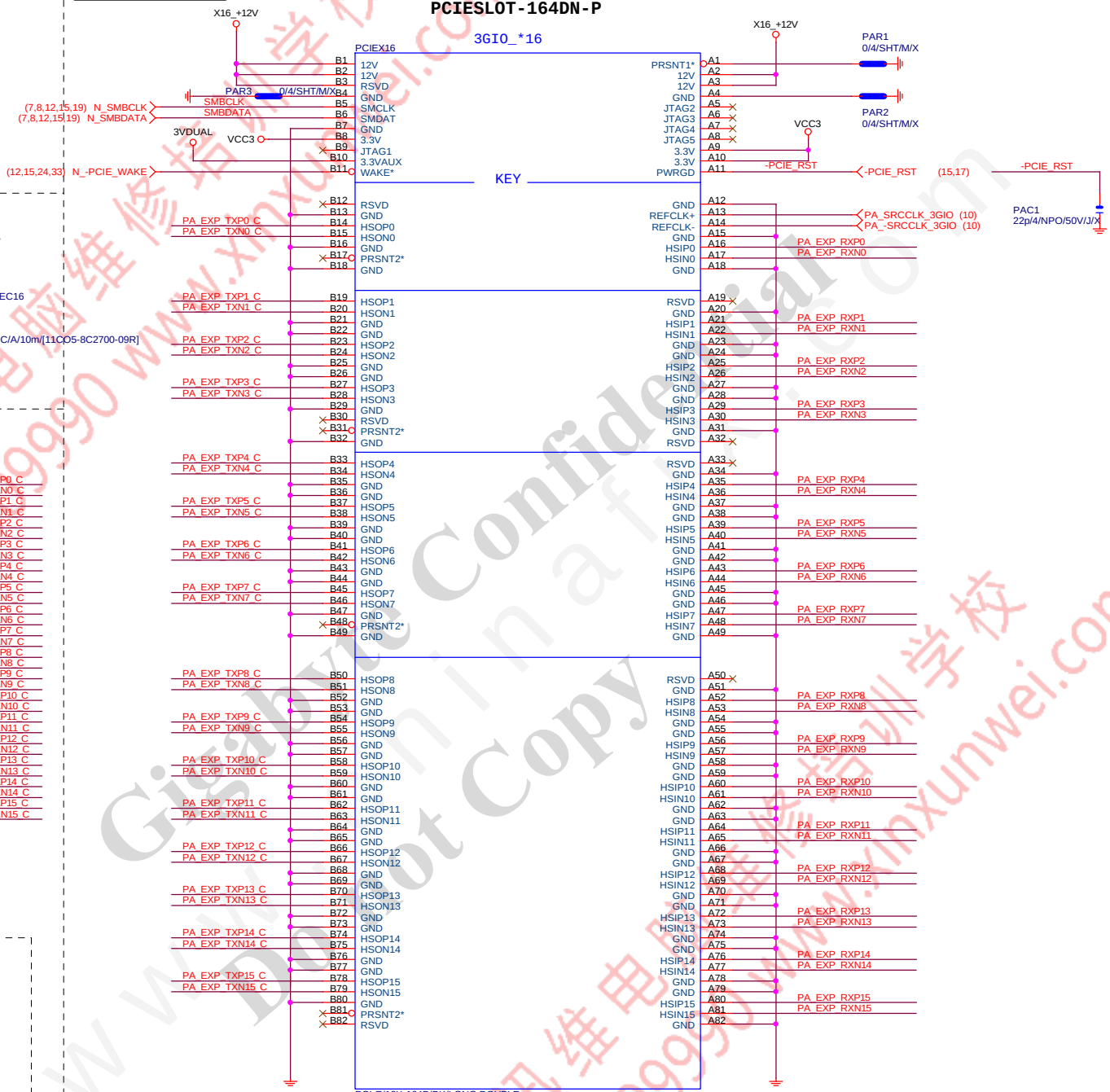
PA_EXP_TXP[0..15] >> PA_EXP_TXP[0..15] (4)

PA_EXP_TXN[0..15] >> PA_EXP_TXN[0..15] (4)

The auxiliary reset circuit is only required for PCIe Gen3 margining and functional link training

PCIEX16 SLOT

PCIESLOT-164DN-P

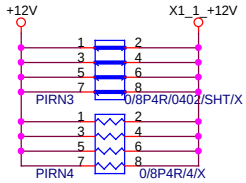


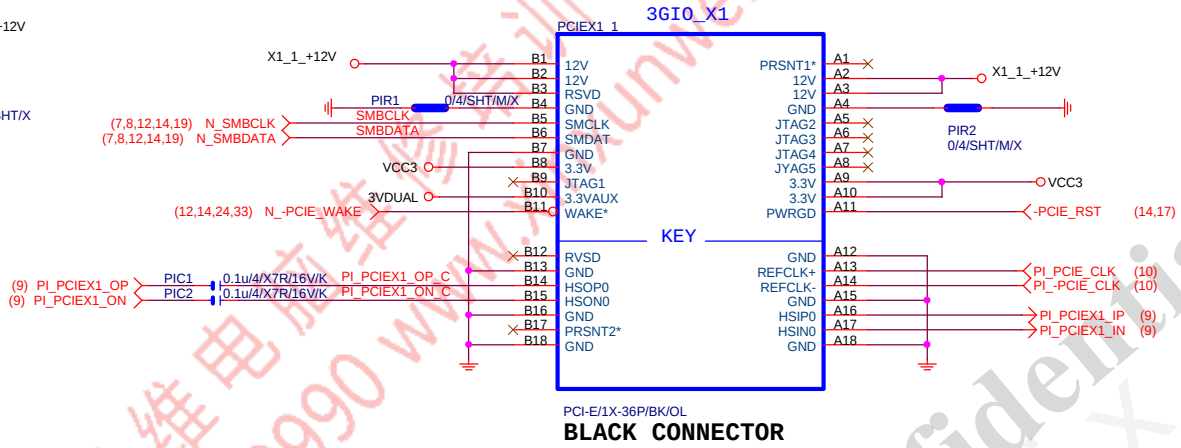
BLACK CONNECTOR

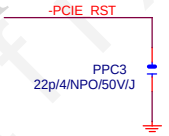
Title	PCI EXPRESS * 16		
Size: Custom	Document Number: GA-H81M-D2V		Rev: 1.0
Date: Friday, July 12, 2013	Sheet 14 of 33		

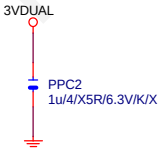
Gigabyte Technology

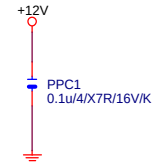
PCIEX1 SLOT

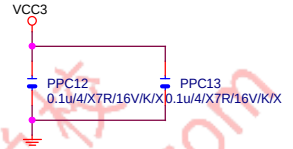


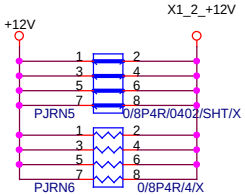


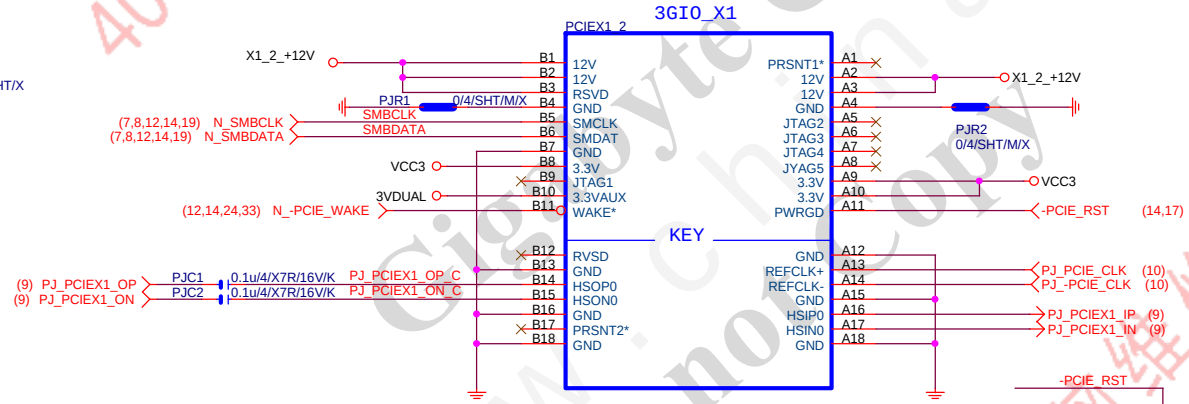


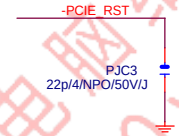












Gigabyte Technology		
Title: PCI EXPRESS X 1 PORT		
Size: Custom	Document Number: GA-H81M-D2V	Rev: 1.0
Date: Friday, July 12, 2013	Sheet 15 of 33	

Gigabyte Technology		
Title: PCI SLOT 1&2		
Size: Custom	Document Number: GA-H81M-D2V	Rev: 1.0
Date: Friday, July 12, 2013	Sheet 16 of 33	

SIO IT8620

IT8620E_BX

-PRCOHOT

-THRMTRIP

PWR SHT

For 8728 EUP function

SIO PU

SIO STRAP

H61M-S2 1.1 JP6 stuff pull down

ITE recommand

EUP control by PCH

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

Power leakage

For IT8721 Power leakage

DUAL BIOS OPT STRAP

SIO_18V

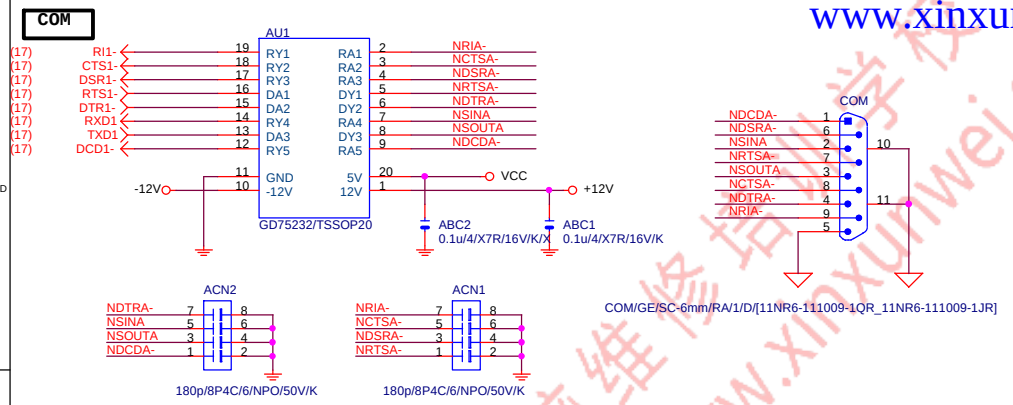
internal power pin, max 22nF cap

MB ID

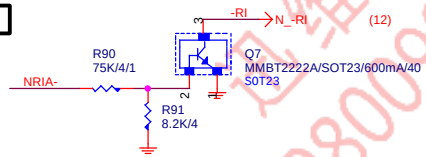
SIO CAP

Gigabyte Technology		
Title	PCH GPIO , CTRL , AUDIO	
Size C	Document Number GA-H81M-D2V	Rev 1.0
Date: Friday, July 12, 2013	Sheet 17 of 33	

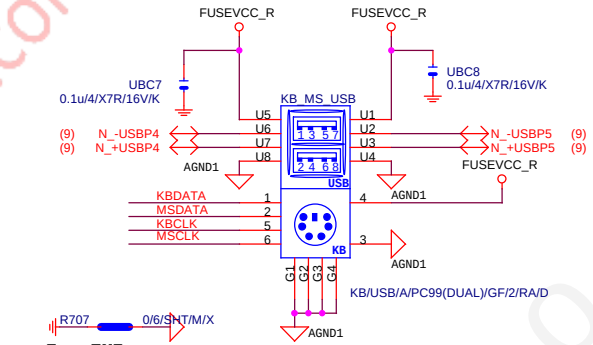
COM

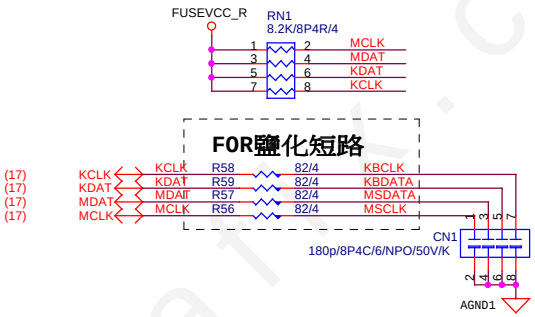


COM RI



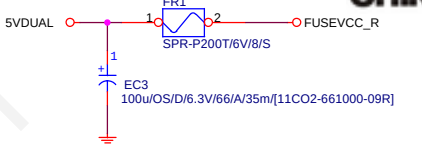
KB/MS





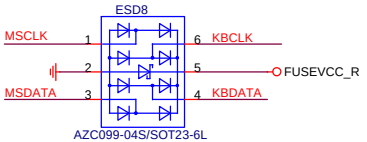
USB2.0 PWR

FUSE-0805
KB_MS_USB 2-Port 2.0A

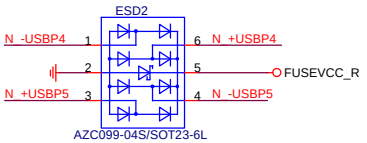


Close to connector

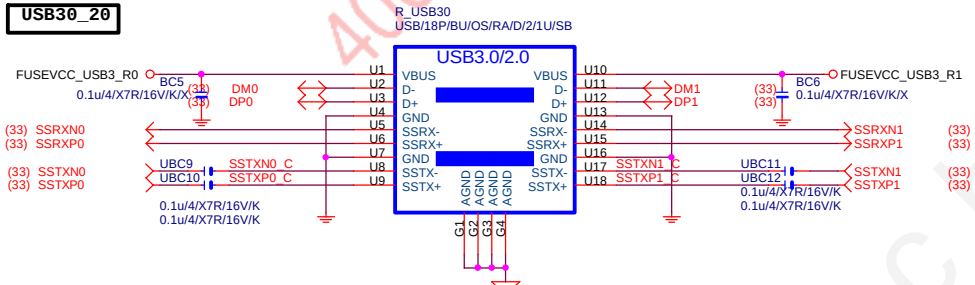
KB/MS ESD



USB2.0 ESD

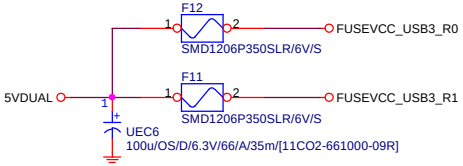


USB30_20



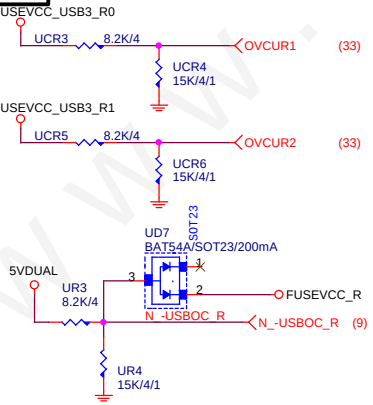
USB30_20 PWR

Polyswitch-1206



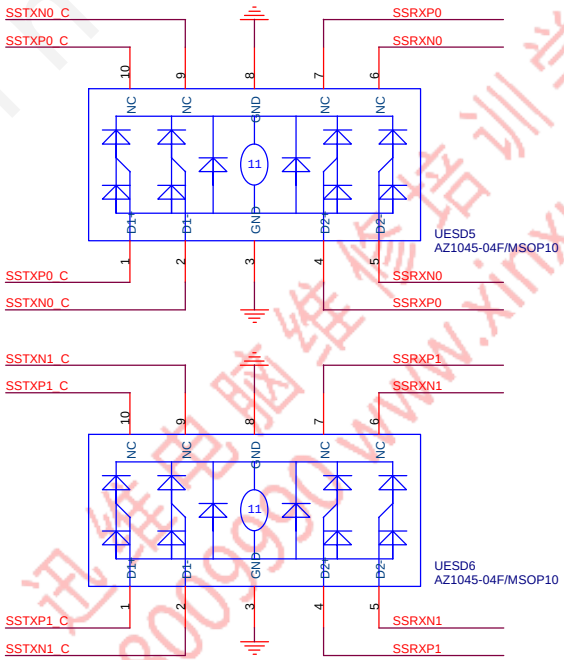
USB3.0 1Port - 1Fuse (3.5A)

-USBOC_R

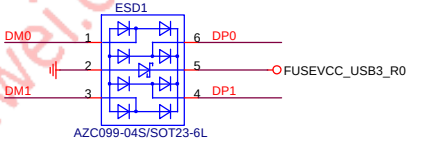


USB30_20 ESD PROCTECT

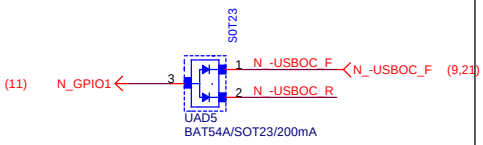
USB3.0 ESD



USB2.0 ESD

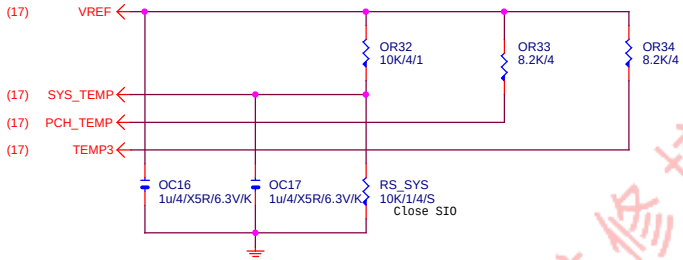


USB POWER PROTECT

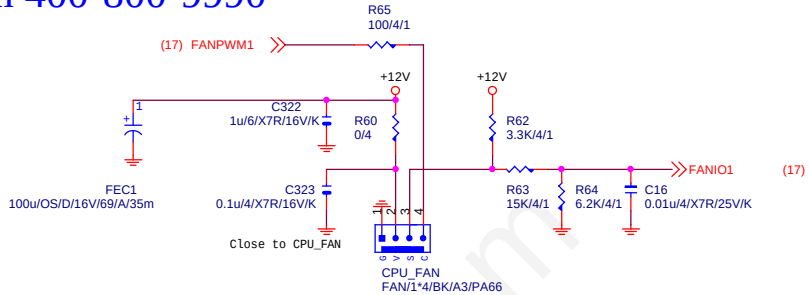


Gigabyte Technology		
Title: COM,-RI,KB_USB,USB_ESATA,-PROCHOT		
Size: Custom	Document Number: GA-H81M-D2V	Rev: 1.0
Date: Friday, July 12, 2013	Sheet 18 of 33	

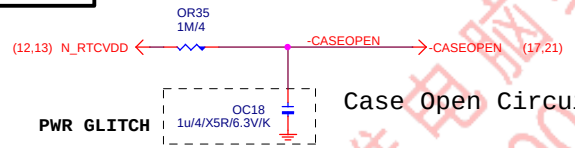
TEMP H/W MONITOR



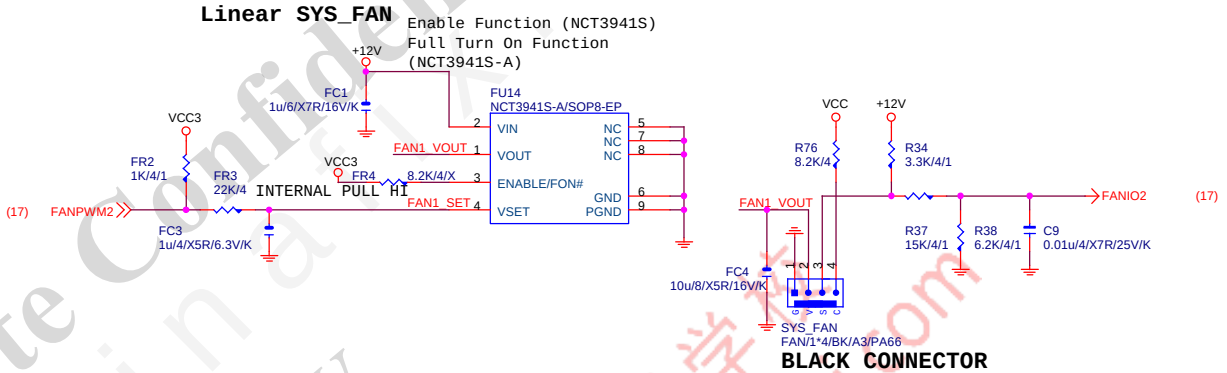
CPU SMART FAN



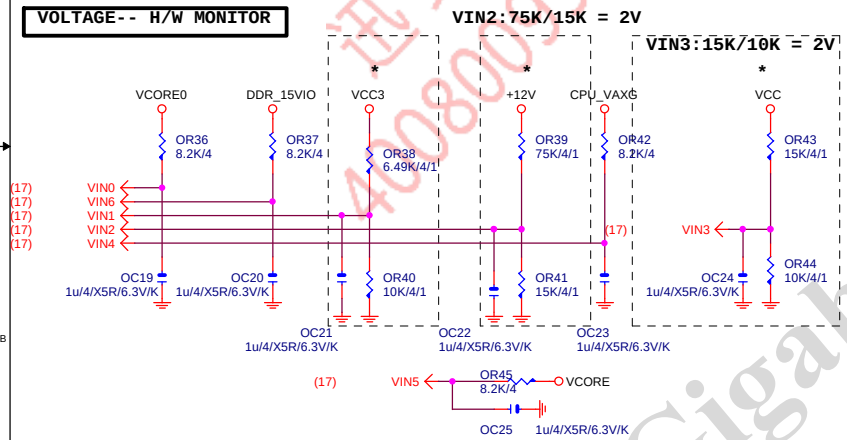
CASE OPEN



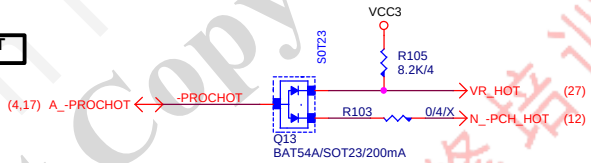
SYS SMART FAN

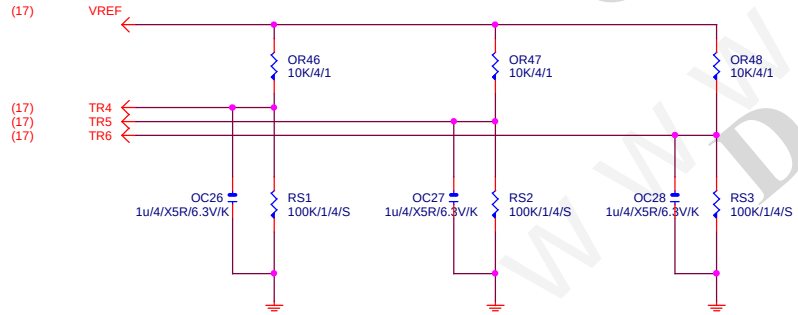


VOLTAGE-- H/W MONITOR



-PROHOT

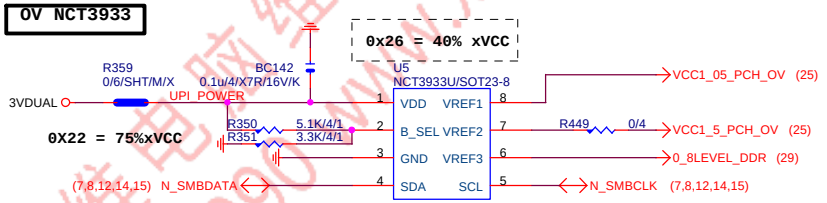




RS1、RS2、RS3 CLOSE CPU
VR MOSFET

接pwm feedback pin

OV NCT3933



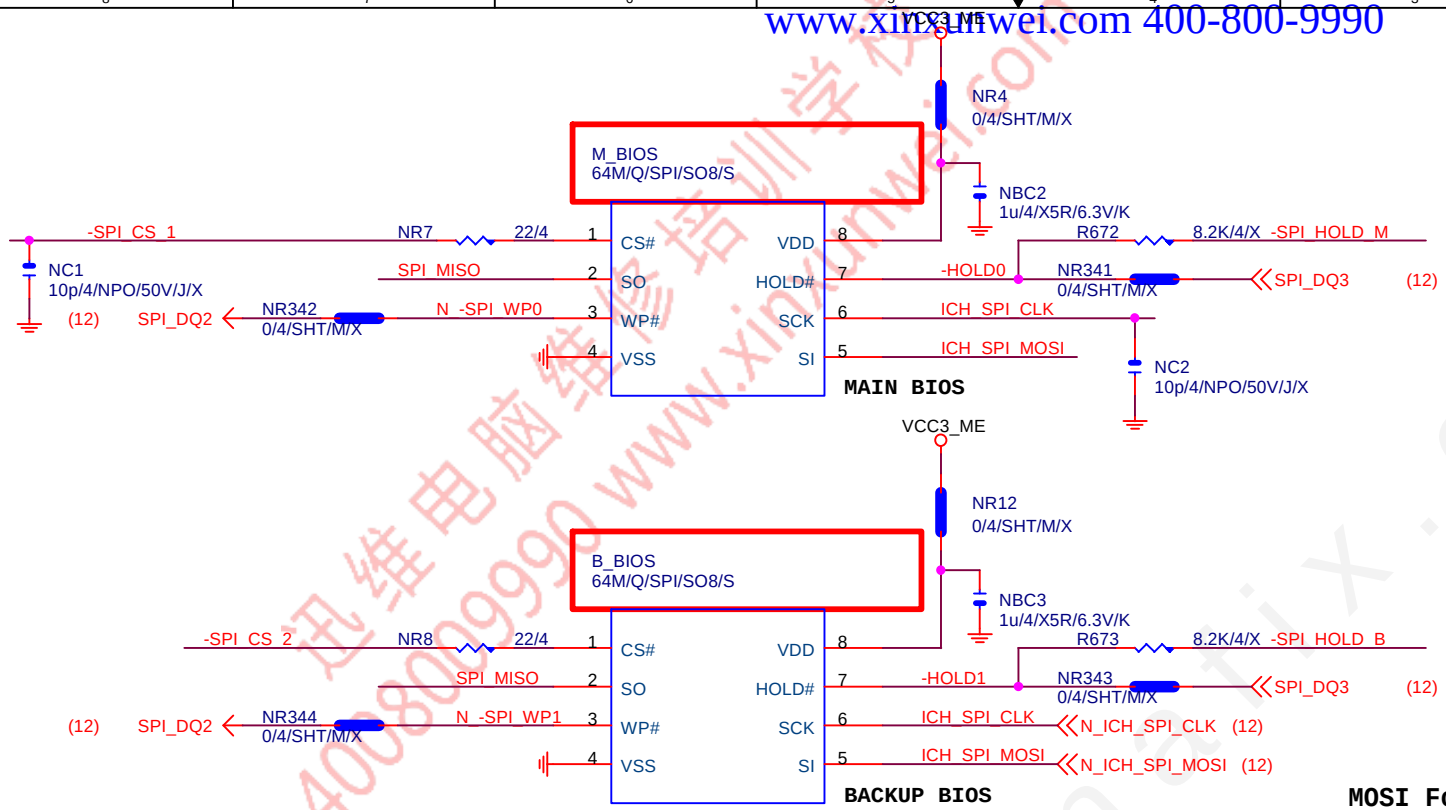
NCT3933	0X2A	0X20	0X22
VREF1	DDRVTT	VREF_DDRA_DQ	PCH Core
VREF2	VREF_DDRA_CA	N/A	VCC1_5_PCH
VREF3	VREF_DDRA_CA	VREF_DDRB_DQ	SMREF

Gigabyte Technology

Title: HWM,FAN CTRL,OV

Size: Custom | Document Number: GA-H81M-D2V | Rev: 1.0

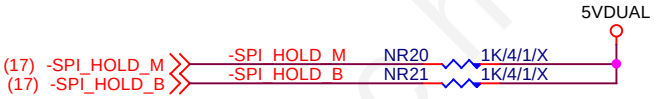
Date: Friday, July 12, 2013 | Sheet 19 of 33

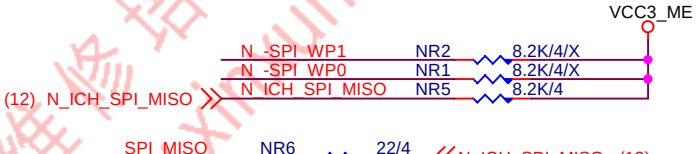


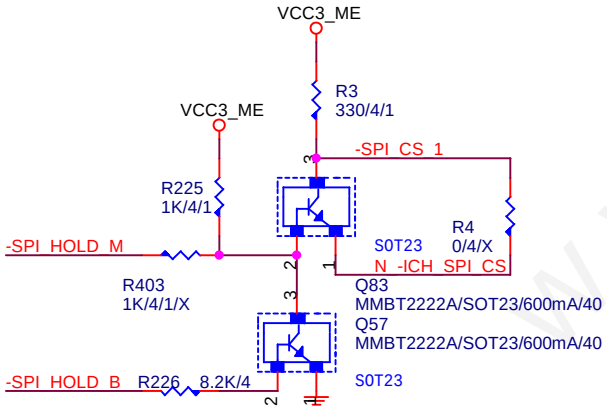
BOOT DEVICE	GNT0	GNT1
LPC	0	0
PCI	0	1
NAND	1	0
SPI	1	1

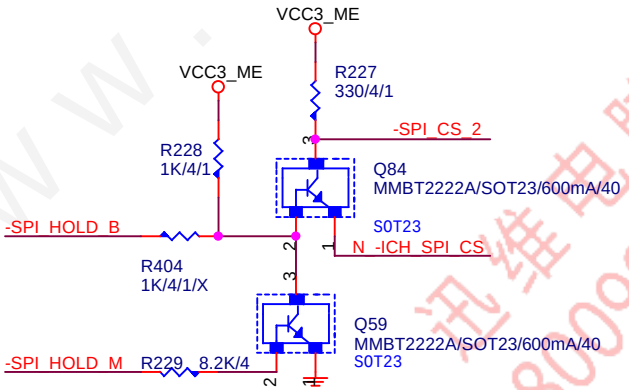
1 means floating
0 means PD 1K

MOSI For DMI RX Termination Voltage

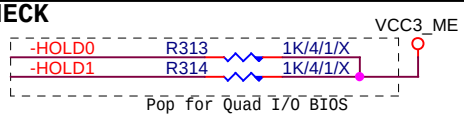








CHECK



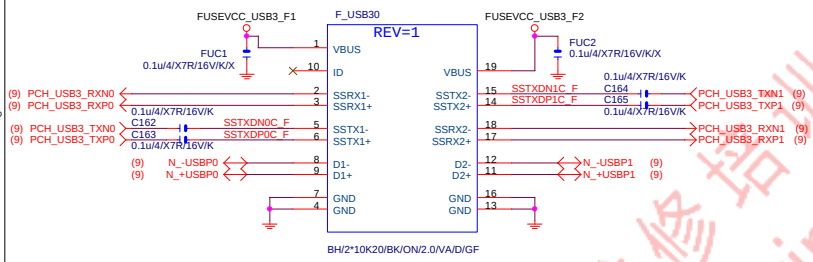
Gigabyte Technology

Title: **DUAL BIOS**

Size: Custom | Document Number: **GA-H81M-D2V** | Rev: **1.0**

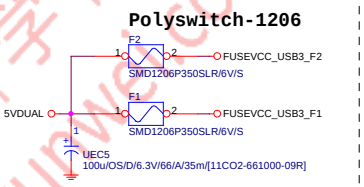
Date: Friday, July 12, 2013 | Sheet 20 of 33

F_USB30



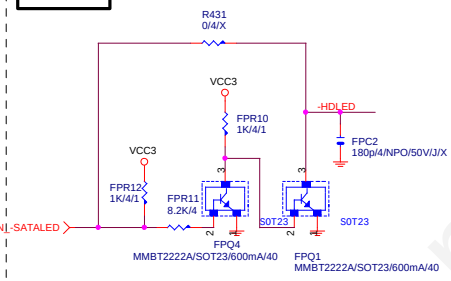
BLACK CONNECTOR

F_USB30 PWR

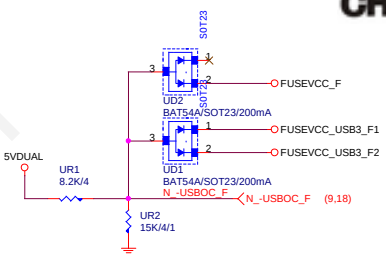


USB3.0 1Port - 1Fuse (3.5A)

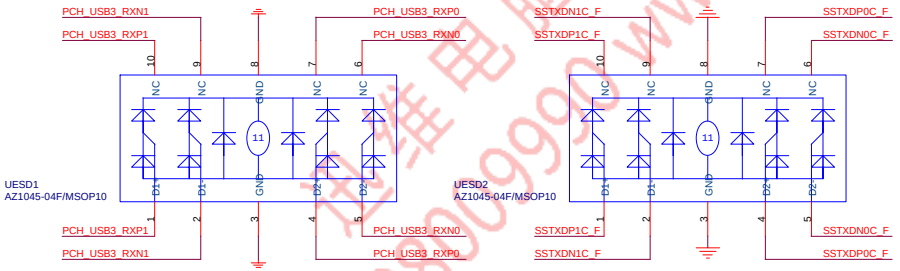
SATA LED

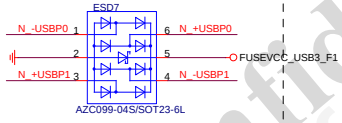


-USBOC_F



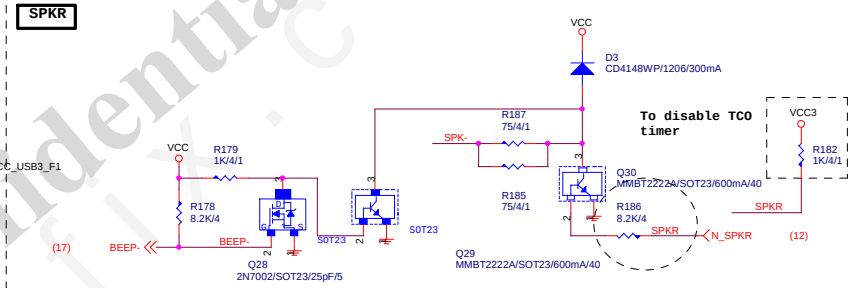
F_USB30 ESD PROTECT



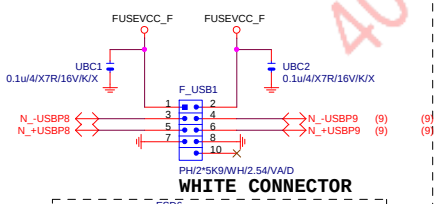


Close to connector

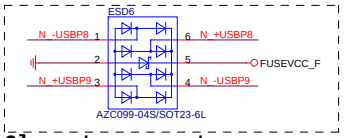
SPKR



FRONT USB1

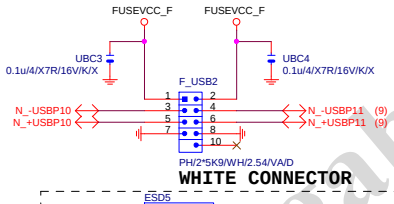


WHITE CONNECTOR

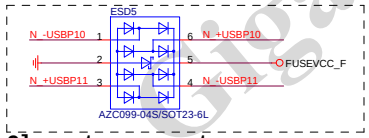


Close to connector

FRONT USB2

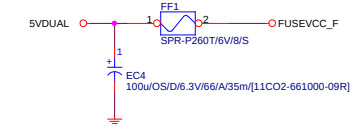


WHITE CONNECTOR

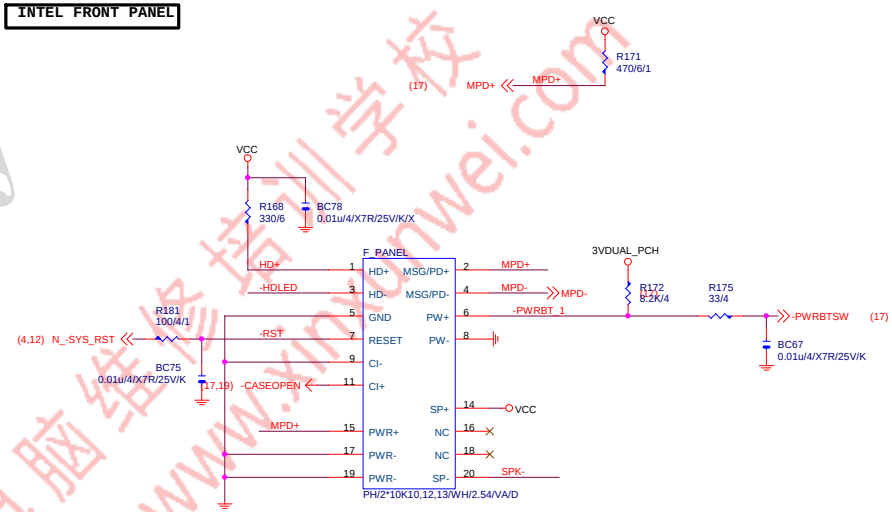


Close to connector

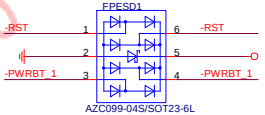
FUSE-0805
F_USB1, F_USB2 4-Port 2.6A



INTEL FRONT PANEL



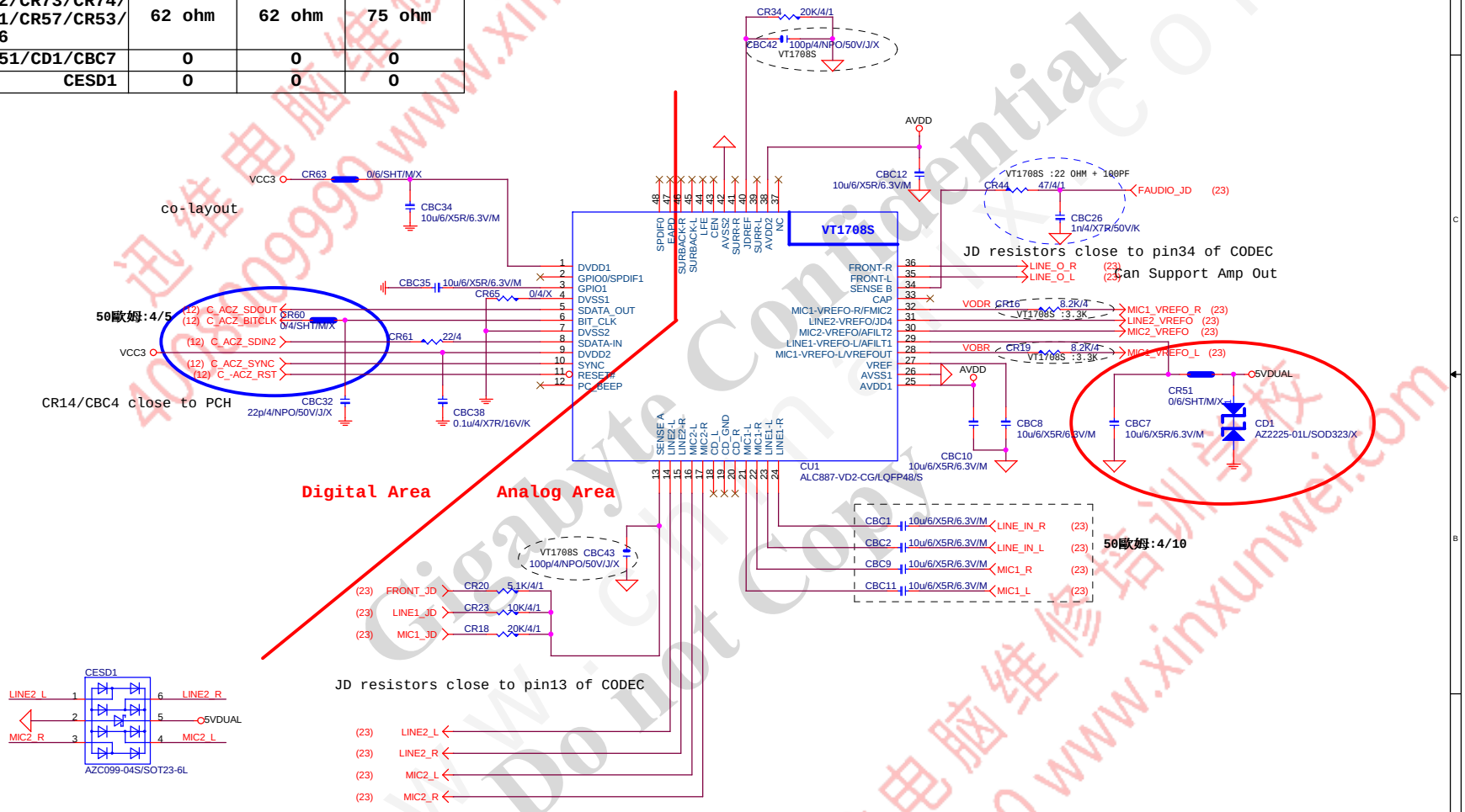
PIN2X10PANEL_NEW



Gigabyte Technology		
Title: FP,F_USB,USB PWR,SPKR,SATA LED		
Size: Custom	Document Number: GA-H81M-D2V	Rev: 1.0
Date: Friday, July 12, 2013	Sheet 21 of 33	

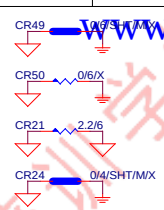
AZALIA CODEC *ALC892/ALC887-VD2/VT1708-CE Colay*

	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

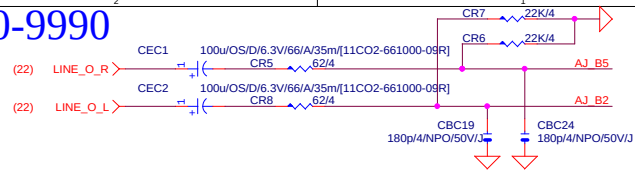


Title	HD AUDIO ALC887B-VD2/VT1708S/VT2021
Size / Custom	Document Number GA-H81M-D2V
Rev	1.0
Date:	Friday, July 12, 2013
Sheet	22 of 33

Gigabyte Technology

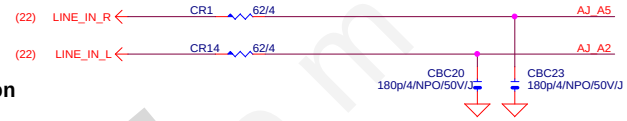


LINE-OUT



Only reserved for ALC888

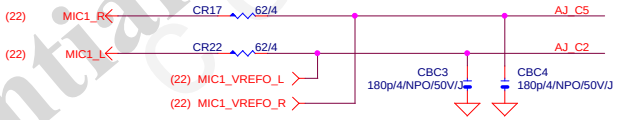
LINE-IN



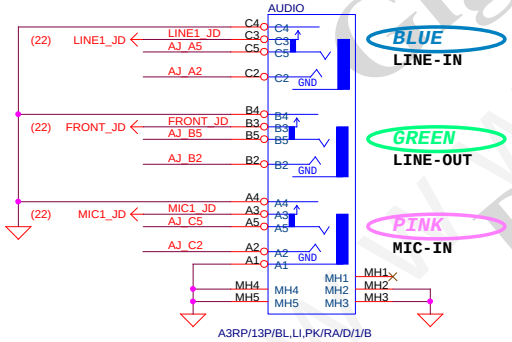
Verify MIC function in LINE-in

For 889A/888

MIC-IN



SPDIF_OUT

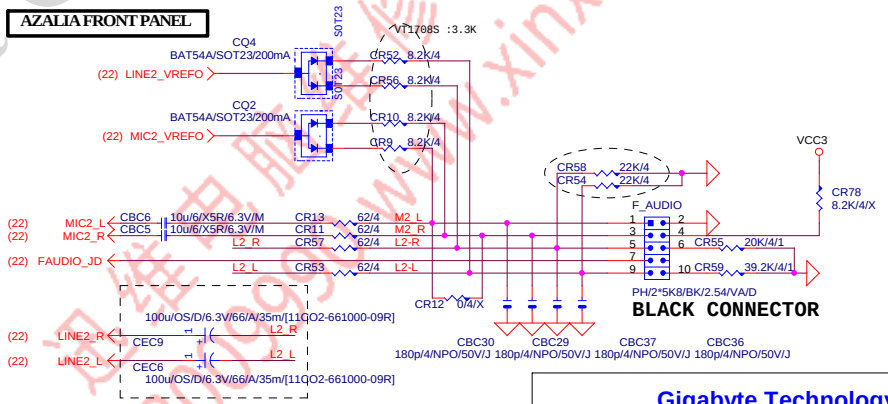


BLUE
LINE-IN

GREEN
LINE-OUT

PINK
MIC-IN

AZALIA FRONT PANEL



Gigabyte Technology		
Title: AUDIO JACK		
Size: Custom	Document Number: GA-H81M-D2V	Rev: 1.0
Date: Friday, July 12, 2013	Sheet 23 of 33	

LAN:RTL8111F/VB/VL

LAR12 2.49K/4/1

LAR10 1K/4/1

LA_VDD33

LAR8 0/6/SHT/M/X

LA_ENSWREG

ENABLE SW

LAU1

RTL8111F-VL-CG/QFN48

LAX1 25M/20p/30ppm/49US/20/D

LA_XTALI

LA_XTALO

LAC5 27p/4/NPO/50V/J

LAC6 27p/4/NPO/50V/J

LAR9 1/6

LAR7 8.2K/4

LAR6 8.2K/4

LABC12 0.1u/4/X7R/16V/K

LABC13 4.7u/6/X5R/6.3V/K

LABC4 100p/4/NPO/50V/J/X

LAR4 1K/4/1

LAR5 15K/4/1

VCC3

N_ISOLATEB (17)

-PFMRST2 (17,33)

LA_ ML-->80歐姆:[15/5/5/5/15]

SRCCLK-->50歐姆:[18/4/10/4/18]

LAC1 0.1u/4/X7R/16V/K

LAC2 0.1u/4/X7R/16V/K

LAC3 0.1u/4/X7R/16V/K

LAC4 0.1u/4/X7R/16V/K

離IC近越好

MDI ESD預留28KV *

LAESD2 AZC099-04S/SOT23-6L

LAESD3 AZC099-04S/SOT23-6L

5VDUAL

LAN POWER

3VDUAL

LA_VDD33

LABC26 10u/6/X5R/6.3V/M

LABC6 0.1u/4/X7R/16V/K/X

LABC16 0.1u/4/X7R/16V/K

LABC15 0.1u/4/X7R/16V/K/X

LABC5 0.1u/4/X7R/16V/K/X

LABC18 0.1u/4/X7R/16V/K/X

LABC14 0.1u/4/X7R/16V/K/X

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

LA_DVDD10

LABC11 0.1u/4/X7R/16V/K/X

LABC10 0.1u/4/X7R/16V/K

LABC9 0.1u/4/X7R/16V/K/X

LABC3 0.1u/4/X7R/16V/K

LABC19 0.1u/4/X7R/16V/K/X

LABC17 0.1u/4/X7R/16V/K

LABC8 0.1u/4/X7R/16V/K/X

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

(CLOSE LAU1 PIN36)

LAL1 4.7uH/0.5A/2520/S/[10LC4-5A470B-01R_10LI5-124708-01R]

CLOSE LAL1

LABC20 4.7u/6/X5R/6.3V/K

LABC21 0.1u/4/X7R/16V/K/X

LA_EVDD10

LAFB1 0/6/SHT/M/X

LABC2 1u/4/X5R/6.3V/K

LABC1 0.1u/4/X7R/16V/K/X

(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

LAESD1 AZC099-04S/SOT23-6L/X

UBESD3 AZC099-04S/SOT23-6L

FUSEVCC_USB3_R2

LABC23 0.1u/4/X7R/16V/K

* 使用RU9 USB_LAN可省略LAESD1保護LED

LA_MDI-->100歐姆:[20/4/8/4/20]

USB30_LAN

USB3.0

USB3+RJ45/[11NR6-702009-K1R]

LABC22 0.01u/4/X7R/25V/K/X

LABC25 0/4/SHT/M/X

LAR13 150/4/1

LAN_3VDUAL_LED

LABC24 0.1u/4/X7R/16V/K/X

LAFB2 0/6/SHT/M/X

LABC7 0.1u/4/X7R/16V/K

UBC49 UBC51 UBC50 UBC52 0.1u/4/X7R/16V/K

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

USB X3 POWER

Polyswitch-1206

UCF1 SMD1206P350SLR/6V/S

UCF2 SMD1206P350SLR/6V/S

UCE10 100u/OS/D/6.3V/66/A/35m/[11CO2-661000-09R]

FUSEVCC_USB3_R2

FUSEVCC_USB3_R3

5VDUAL

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

UCR42 8.2K/4

UCR43 15K/4/1

UCR1 8.2K/4

UCR2 15K/4/1

OVCUR3 (33)

OVCUR4 (33)

EMI SHORT PAD

PS:視EMI需求

LAR24 0/6/SHT/M/X

UCESD1

UCESD2

AZ1045-04F/MSOP10

Close to connector

AZ1045-04F/MSOP10

Close to connector

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

Dual Color LED

Green

Orange

Single Color LED

Yellow

YELLOW ORANGE GREEN (+,-)

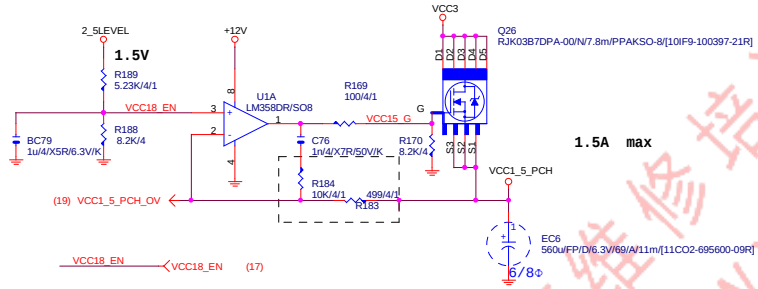
Gigabyte Technology

Title: Realtek RTL8111G

Size: Custom | Document Number: GA-H81M-D2V | Rev: 1.0

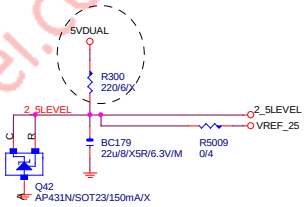
Date: Friday, July 12, 2013 | Sheet 24 of 33

VCC1_8_PCH

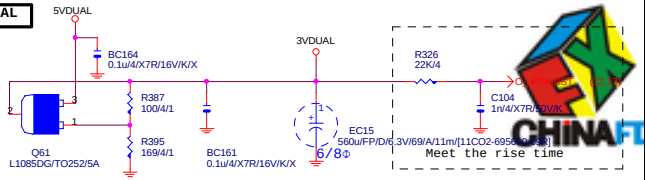


2_5LEVEL

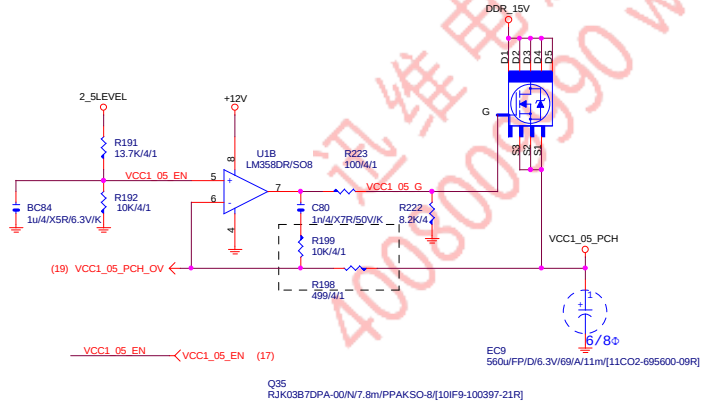
ERP

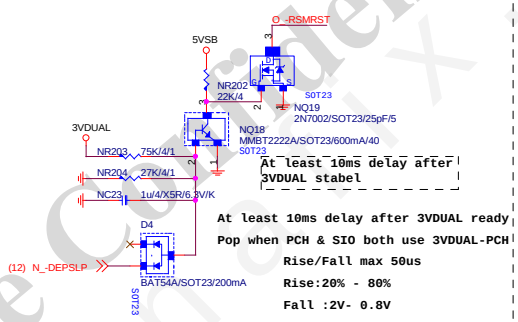


3VDUAL

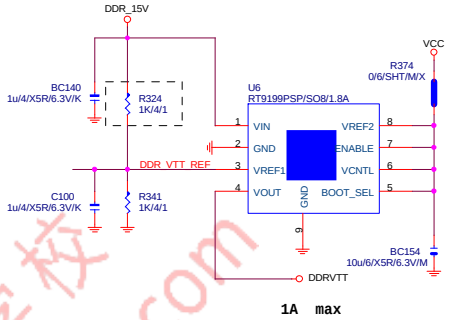


VCC1_05_PCH

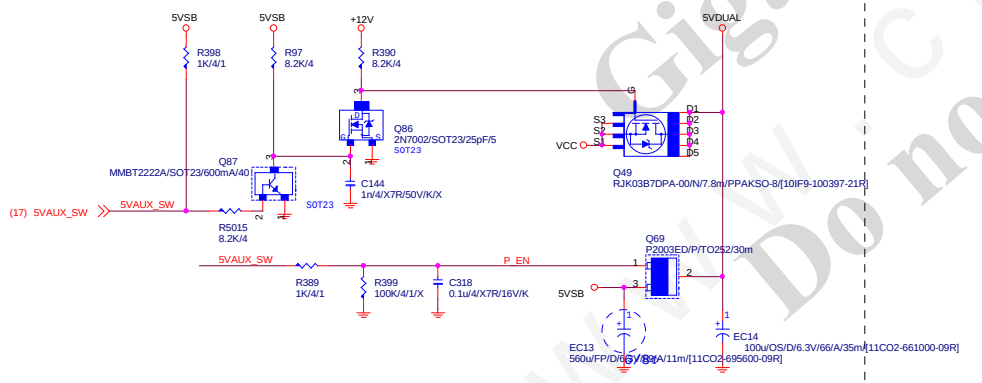




DDRVTT

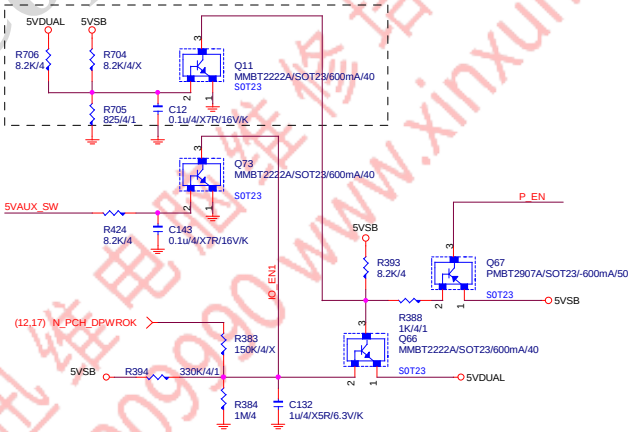


5VDUAL



5VDUAL SHORT PROTECT

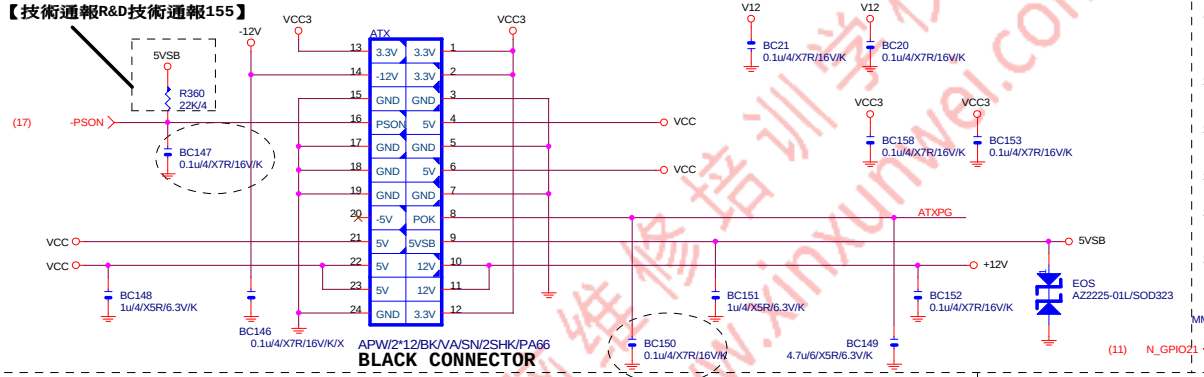
5VSB OVP:7.5V protection



Gigabyte Technology		
Title: DISCRETE POWER		
Size: Custom	Document Number: GA-H81M-D2V	Rev: 1.0
Date: Friday, July 12, 2013	Sheet 25 of 33	

ATXX24 POWER CONNECTOR

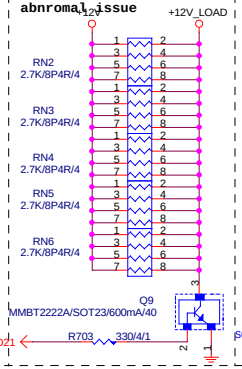
【技術通報R&D技術通報155】



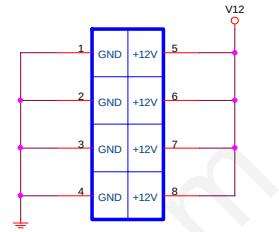
BLACK CONNECTOR

【技術通報R&D技術通報158】

To fix 12V light load abnroma l issue



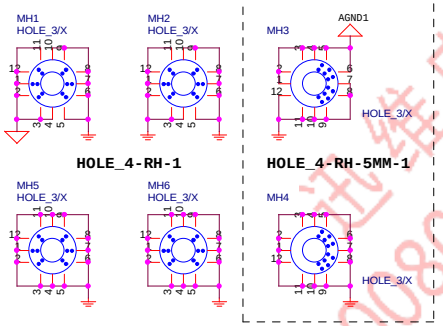
ATXX4 POWER CONNECTOR



BLACK CONNECTOR

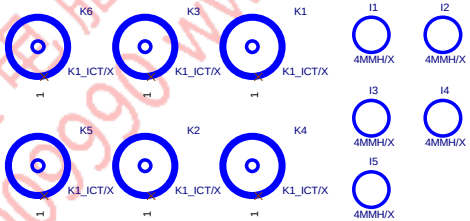
ATX_12V_2X4
APW/2*4/BK/OC/P/4.2/VA/SN/OH::Location ATX_12V_2X4

TPM



HOLE_4-RH-1

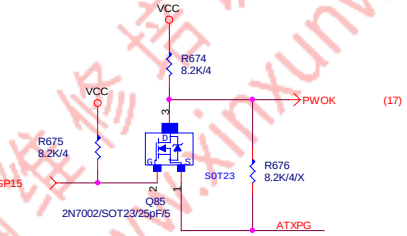
HOLE_4-RH-5MM-1

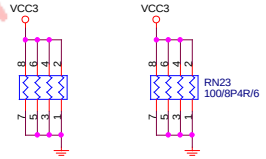


To prevent the 5VSB under loading when boot

PWOK PATCH

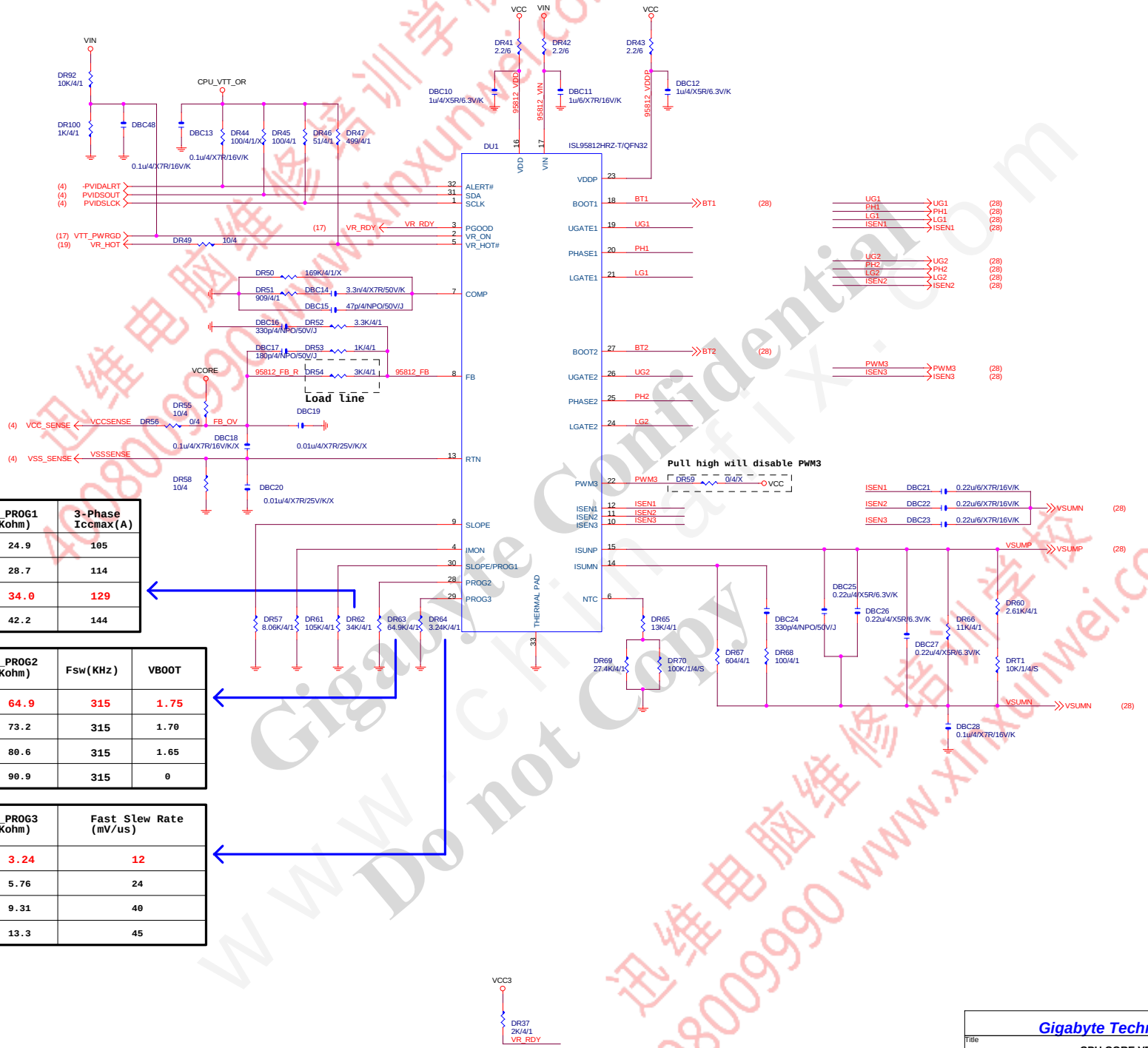
【技術通報R&D技術通報154】





FIX PWR MINMUN LOAD

Gigabyte Technology		
Title: ATX CONNECTOR		
Size: Custom	Document Number: GA-H81M-D2V	Rev: 1.0
Date: Friday, July 12, 2013	Sheet 26 of 33	



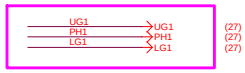
R_PROG1 (Kohm)	3-Phase Iccmax(A)
24.9	105
28.7	114
34.0	129
42.2	144

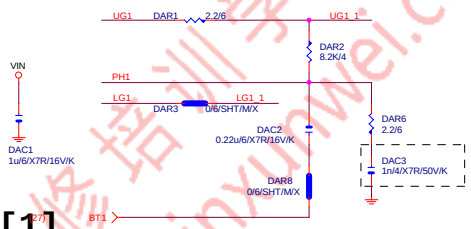
R_PROG2 (Kohm)	Fsw(KHz)	VBOOT
64.9	315	1.75
73.2	315	1.70
80.6	315	1.65
90.9	315	0

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

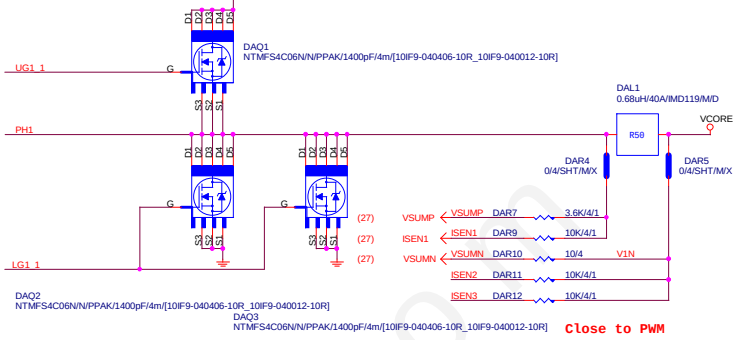
Gigabyte Technology	
Title	CPU CORE VR-1
Size: Custom	Document Number: GA-H81M-D2V
Rev	1.0
Date: Friday, July 12, 2013	Sheet 27 of 33

PHASE 1



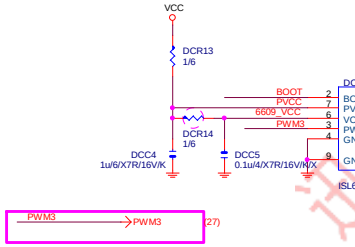


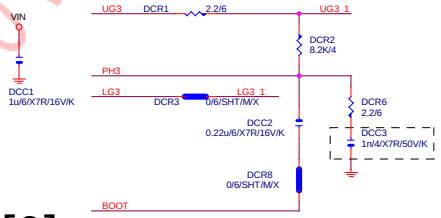
[1]



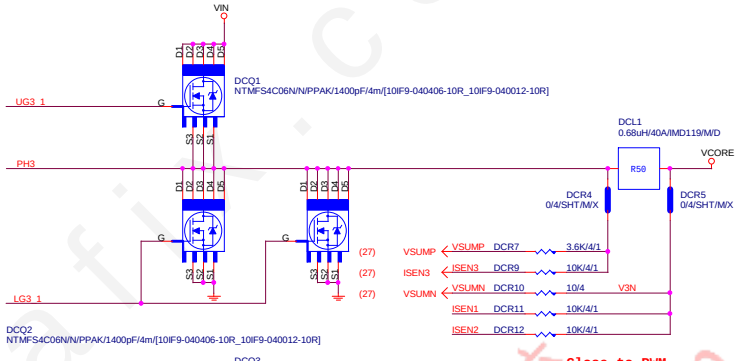
Close to PWM

PHASE 3



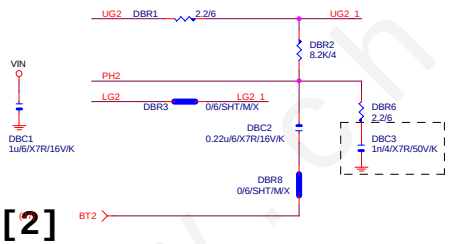


[3]

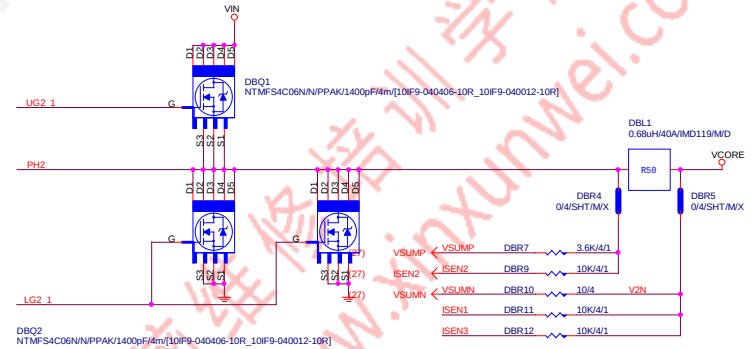


Close to PWM

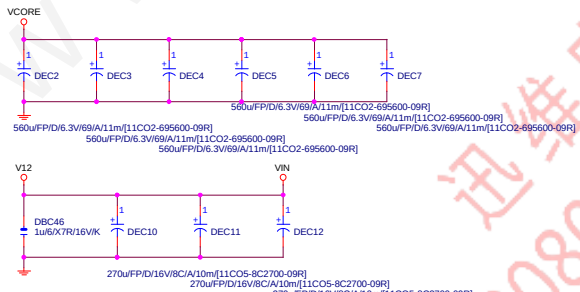
PHASE 2



[2]

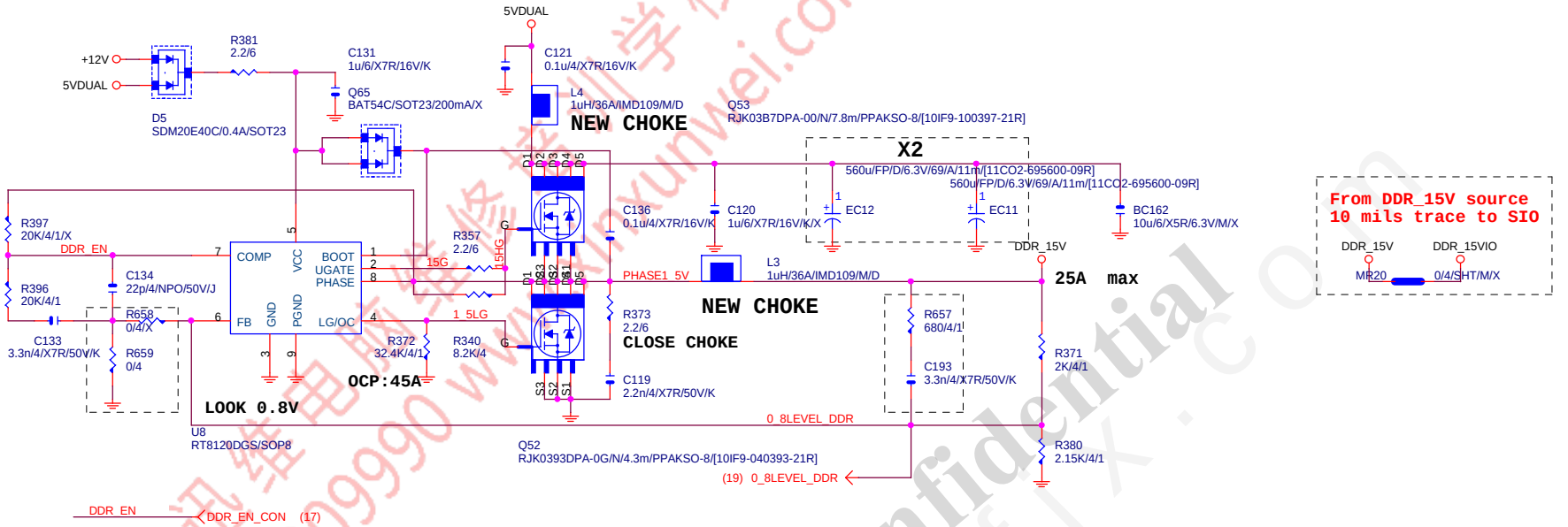


Close to PWM



Gigabyte Technology			
Title: CPU CORE VR-2			
Size: Custom	Document Number: GA-H81M-D2V		Rev: 1.0
Date: Friday, July 12, 2013	Sheet 28 of 33		

DDR15V



From DDR_15V source
10 mils trace to SIO

DDR_15V — MR20 — DDR_15VIO — 0/4/SHT/M/X

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

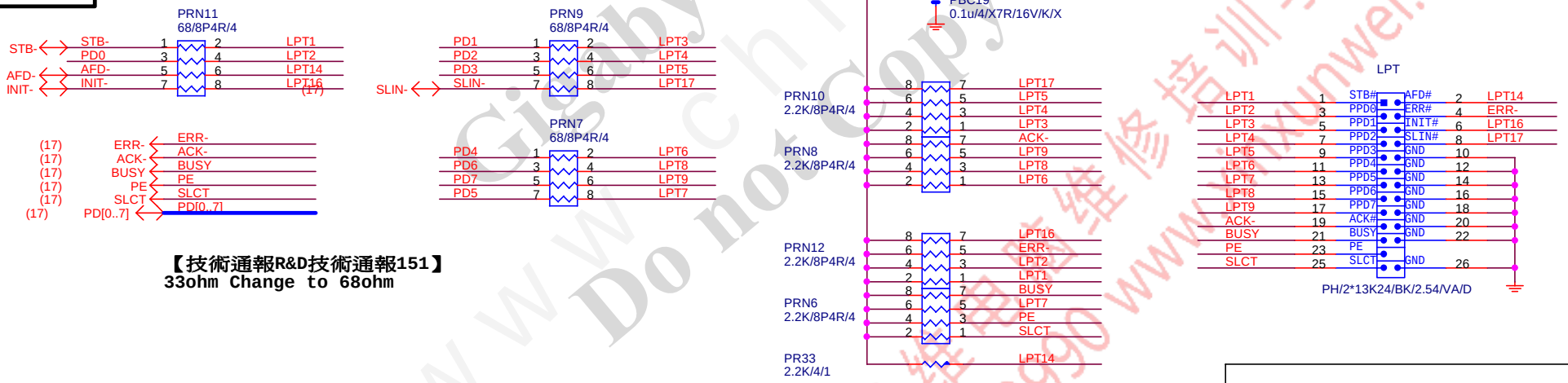
Gigabyte Technology			
Title: DDR POWER			
Size: Custom	Document Number: GA-H81M-D2V		Rev: 1.0
Date: Friday, July 12, 2013	Sheet 29 of 33		

VCC1_05_ME

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

VCC3_ME

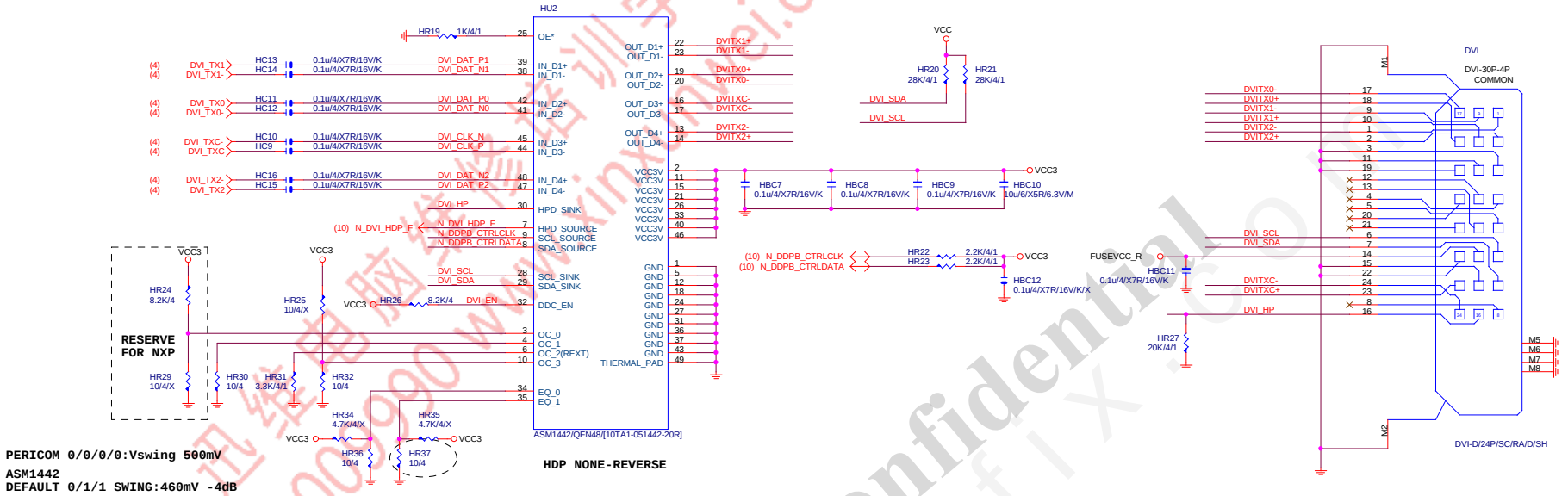
LPT PORT



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

Gigabyte Technology			
Title: LPT			
Size: Custom	Document Number: GA-H81M-D2V		Rev: 1.0
Date: Friday, July 12, 2013	Sheet 30 of 33		

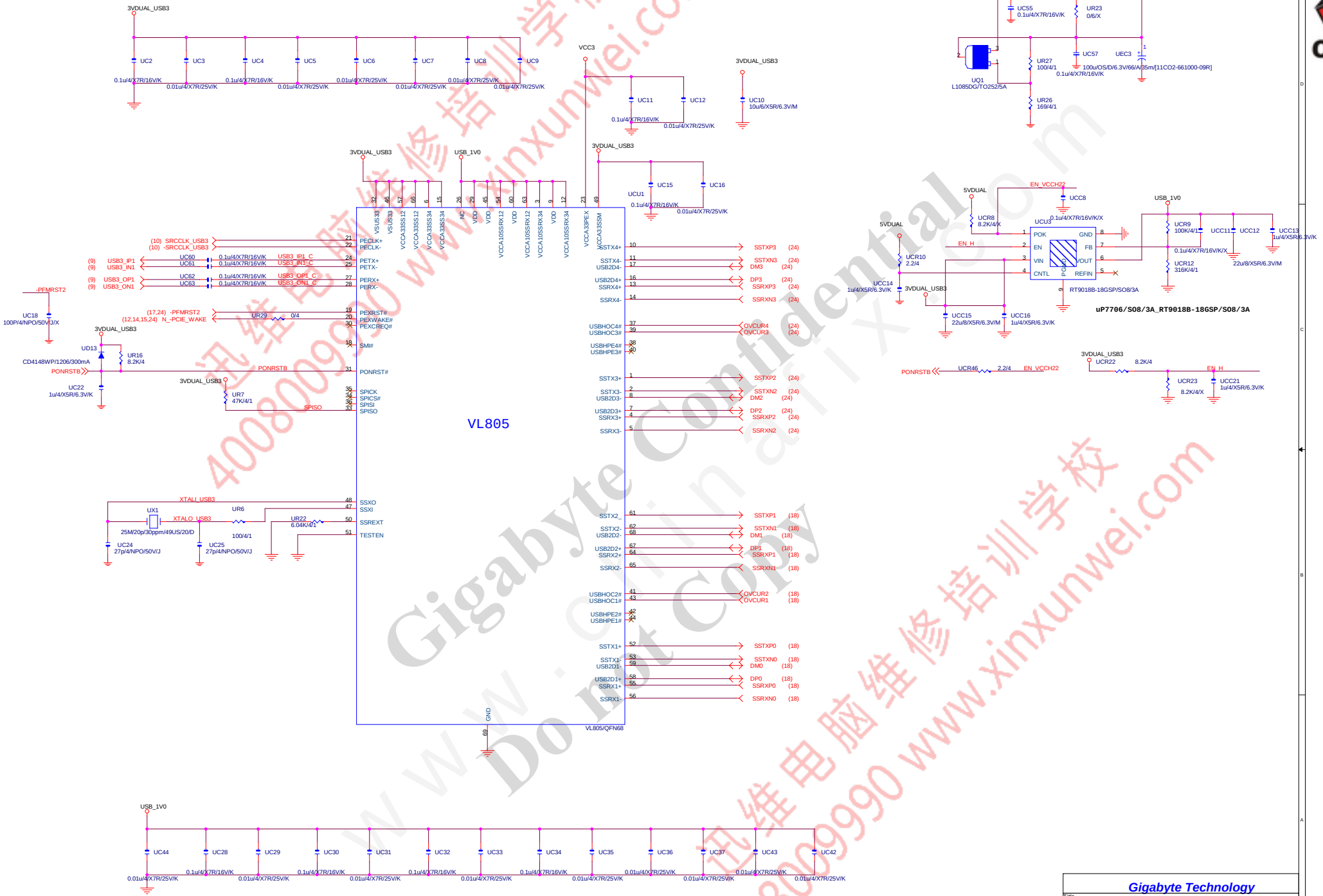
DVI LEVEL SHIFT



HDMI LEVEL SHIFT

Gigabyte Technology		
Title: DVI		
Size: Custom	Document Number: GA-H81M-D2V	Rev: 1.0
Date: Friday, July 12, 2013	Sheet 31 of 33	

Gigabyte Technology		
Title: ITE IT8892E		
Size: Custom	Document Number: GA-H81M-D2V	Rev: 1.0
Date: Friday, July 12, 2013	Sheet 32 of 33	



Gigabyte Technology		
Title	USB3 EJ188	
Size C	Document Number GA-H81M-D2V	Rev 1.0
Date: Friday, July 12, 2013	Sheet 33 of 33	