Model Name: GA-H81M-D2W WG

Revision
1.01

SHEET	TITLE
01	COVER SHEET
02	BOM & PCB MODIFY HISTORY
03	BLOCK DIAGRAM
04	CPU_LGA1150-A
05	CPU_LGA1150-B
06	CPU_LGA1150-C
07	DDR III CHANNEL A
08	DDR III CHANNEL B
09	PCH_FDI,DMI,USB,PCIE,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-D2W WG | Rev: 1.01

Date: Tuesday, December 31, 2013 | Sheet 1 of 33

Model Name: GA-H81M-D2W WG

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變更為'LM358DR/SO8 LAR13,'150/6變更為'150/4/1 Q59,Q83,Q84,Q57,MMBT2222A/SOT23/600mA/40/[10IT1-002222-11R]變更為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]	
2013/12/16	1. ALC887修改ESD為加強版-32R	9MH81MD2W-WG-10J

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
2013/07/22	1.由H81M-D2V Rev 1.0來修改 2.VGA change to DVI-I 3.COM change to pin header 4.Remove one port one fuse 5.F_PANEL改 2x5 6.Remove DVI level shift	Rev 0.1
2013/08/09	1.修正DVI-I的訊號	Rev 0.2
2013/08/26	1.文字面 UEFI DualBIOS 改為 UEFI BIOS 2.增加X'TAL 切割獨立GND	Rev 1.0
2013/09/17	1.修改PCH 25MHz走線	Rev 1.01

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

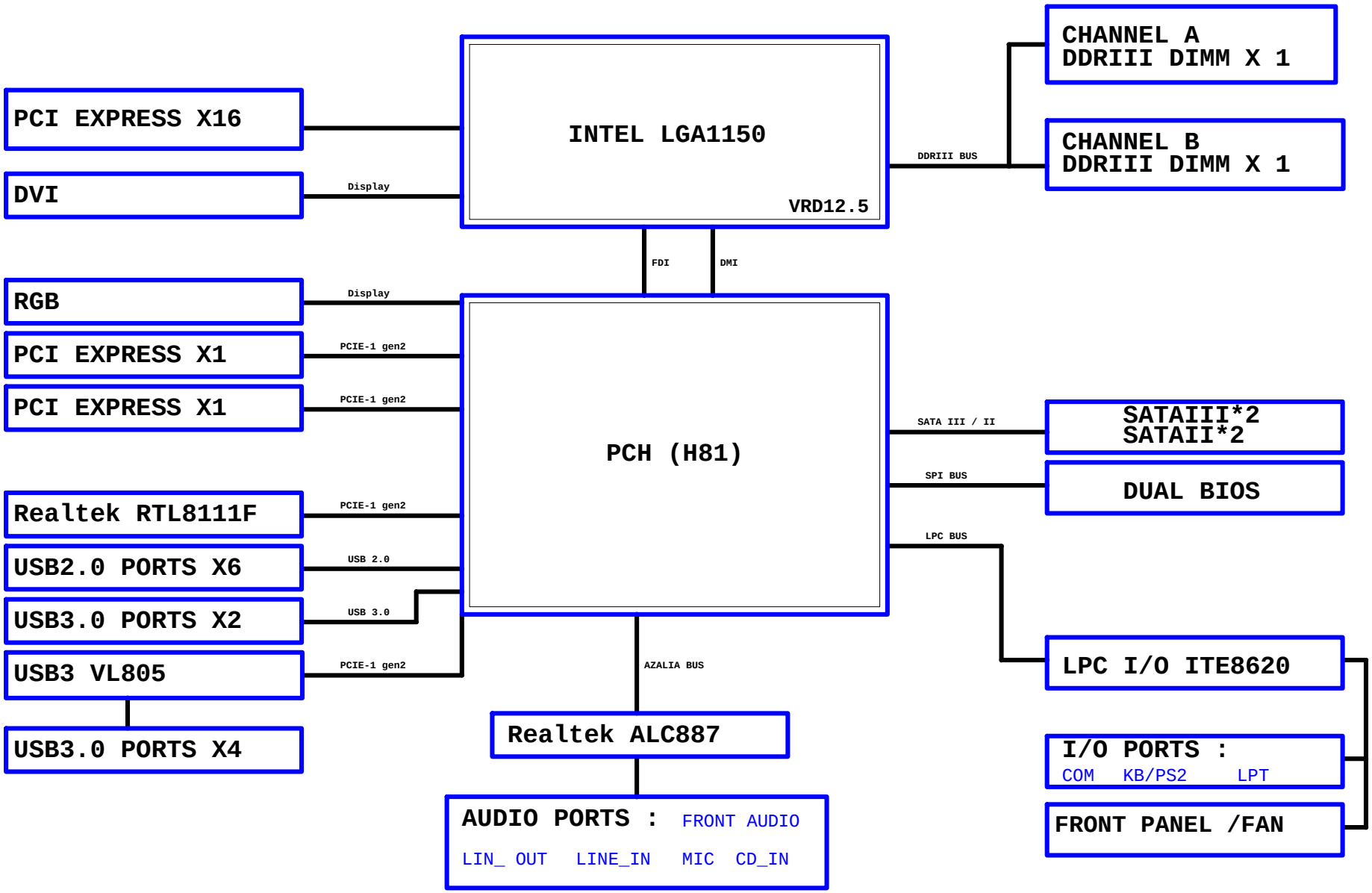
Gigabyte Technology

Title: BOM & PCB MODIFY HISTORY

Size: Custom | Document Number: GA-H81M-D2W WG | Rev: 1.01

Date: Tuesday, December 31, 2013 | Sheet 2 of 33

BLOCK DIAGRAM



Gigabyte Technology		
Title: BLOCK DIAGRAM		
Size: C	Document Number: GA-H81M-D2W WG	Rev: 1.01
Date: Tuesday, December 31, 2013	Sheet 3 of 33	

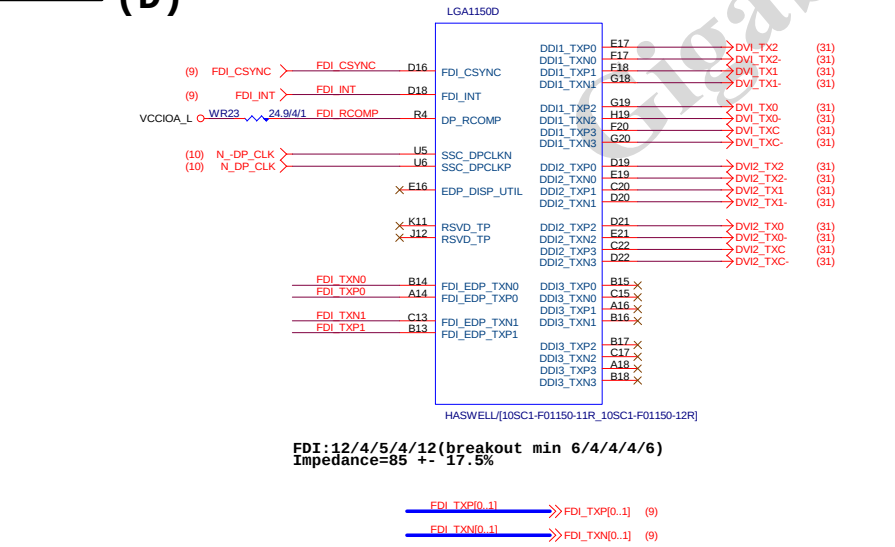
LGA1150 (E)

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)

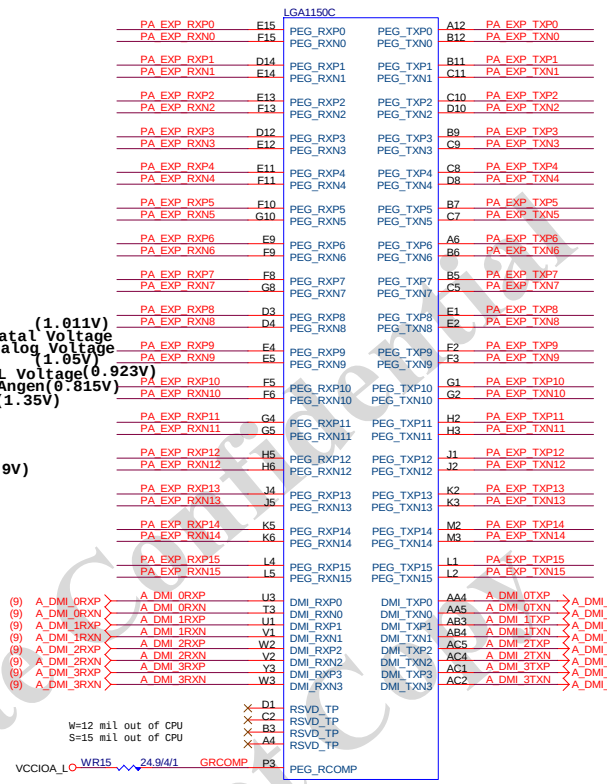


FDI:12/4/5/4/12(breakout min 6/4/4/4/6)
Impedance=85 +- 17.5%

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%

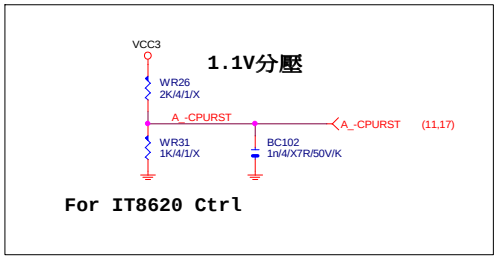


W=12 mil out of CPU
S=15 mil out of CPU

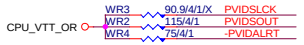
DMI:12/4/4/4/12(breakout min 8/4/4/4/8)
Impedance=85 +- 17.5%

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)

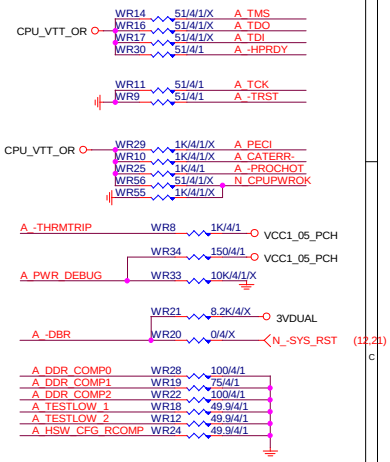
-CPURST



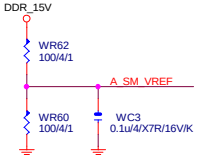
CPU SVID



CPU PU/PD



SM REF



Gigabyte Technology			
Title: CPU LGA1150-A			
Size: Custom	Document Number: GA-H81M-D2W WG		Rev: 1.01
Date: Tuesday, December 31, 2013	Sheet 4 of 33		

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
	AU22	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	AL4	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
-SRASA	AU12	DDR0_RAS*	DDR0_DQ62	AE2	MDA62
-SWEA	AU11	DDR0_WE*	DDR0_DQ63	AE1	MDA63
	AV20	RSVD	DDR0_DQS_P0	AE39	DQSA0
	AW27	RSVD	DDR0_DQS_P1	AJ39	DQSA1
			DDR0_DQS_P2	AN39	DQSA2
			DDR0_DQS_P3	AV36	DQSA3
			DDR0_DQS_P4	AV5	DQSA4
			DDR0_DQS_P5	AP3	DQSA5
-SCASA	AU9	DDR0_CAS*	DDR0_DQS_P6	AK3	DQSA6
			DDR0_DQS_P7	AE3	DQSA7
				AV32	
DDR3_RST	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	AF2	-DQSA7
			DDR0_DQS_N7	AU32	
			DDR0_DQS_N8		

WR61 0/4/SHT/MIX

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_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
			DDR1_DQ31	AP28	MDB31
SBAB0	AK17	DDR1_BA0	DDR1_DQ32	AR12	MDB32
SBAB1	AL18	DDR1_BA1	DDR1_DQ33	AL13	MDB33
SBAB2	AW28	DDR1_BA2	DDR1_DQ34	AL12	MDB34
			DDR1_DQ35	AR13	MDB35
CKEB0	AW29	DDR1_CKE0	DDR1_DQ36	AP13	MDB36
CKEB1	AY29	DDR1_CKE1	DDR1_DQ37	AM13	MDB37
	AU28	DDR1_CKE2	DDR1_DQ38	AM12	MDB38
	AU29	DDR1_CKE3	DDR1_DQ39	AR9	MDB39
			DDR1_DQ40	AP9	MDB45
-CSB0	AP17	DDR1_CS_N0	DDR1_DQ41	AR6	MDB41
-CSB1	AN15	DDR1_CS_N1	DDR1_DQ42	AP6	MDB47
	AN17	DDR1_CS_N2	DDR1_DQ43	AR10	MDB43
	AL15	DDR1_CS_N3	DDR1_DQ44	AP10	MDB44
			DDR1_DQ45	AR7	MDB40
			DDR1_DQ46	AP7	MDB46
			DDR1_DQ47	AM9	MDB42
DCLKB0	AM20	DDR1_CLK_P0	DDR1_DQ48	AL9	MDB52
-DCLKB0	AM21	DDR1_CLK_N0	DDR1_DQ49	AL6	MDB53
DCLKB1	AP22	DDR1_CLK_P1	DDR1_DQ50	AL7	MDB50
-DCLKB1	AP21	DDR1_CLK_N1	DDR1_DQ51	AM10	MDB55
			DDR1_DQ52	AL10	MDB48
	AN20	DDR1_CLK_P2	DDR1_DQ53	AM6	MDB49
	AN21	DDR1_CLK_N2	DDR1_DQ54	AM7	MDB54
	AP19	DDR1_CLK_P3	DDR1_DQ55	AH6	MDB51
	AP20	DDR1_CLK_N3	DDR1_DQ56	AH7	MDB61
			DDR1_DQ57	AE6	MDB60
-SCASB	AP16	DDR1_CAS*	DDR1_DQ58	AE7	MDB59
	AL20	RSVD	DDR1_DQ59	AJ6	MDB63
-SRASB	AM18	DDR1_RAS*	DDR1_DQ60	AJ7	MDB56
-SWEB	AK16	DDR1_WE*	DDR1_DQ61	AF6	MDB57
			DDR1_DQ62	AF7	MDB58
VREF_DQA	AB39	DDR_VREF_DQ0	DDR1_DQ63	AE35	MDB62
VREF_DQB	AB40	DDR_VREF_DQ1	DDR1_DQS_P0	AL33	DQSB0
			DDR1_DQS_P1	AP33	DQSB1
			DDR1_DQS_P2	AN28	DQSB2
			DDR1_DQS_P3	AN12	DQSB3
			DDR1_DQS_P4	AP8	DQSB4
			DDR1_DQS_P5	AL8	DQSB5
			DDR1_DQS_P6	AG7	DQSB6
			DDR1_DQS_P7	AN25	DQSB7
			DDR1_DQS_P8	AF34	
			DDR1_DQS_N0	AK33	-DQSB0
			DDR1_DQS_N1	AN33	-DQSB1
			DDR1_DQS_N2	AP29	-DQSB2
			DDR1_DQS_N3	AN13	-DQSB3
			DDR1_DQS_N4	AR8	-DQSB4
			DDR1_DQS_N5	AM8	-DQSB5
			DDR1_DQS_N6	AG6	-DQSB6
			DDR1_DQS_N7	AN26	-DQSB7
			DDR1_DQS_N8		

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-D2W WG		Rev: 1.01
Date: Tuesday, December 31, 2013	Sheet 5 of 33		

LGA1150 (F,J)

(1.0V)
CPU_VTT_OR
WBC1
22u/8/X5R/6.3V/M
VCORE
LGA1150F
WR65
0/4/X
VCCST
WBC23
0.1u/4/X7R/16V/K
WBC13
0.1u/4/X7R/16V/K
WR63
0/4/SHT/M/X
VCCIO2PCH
(1.07V)
WR64
0/4/SHT/M/X
VCC1_05_PCH
VCORE
VCORE
DDR_15V
LGA1150J
WR67
6.04K/4/1
(11,12,17) O_PWROK1
VCCST_PWRGD
WR66
3.16K/4/1
HASWELL/[10SC1-F01150-11R_10SC1-F01150-12R]
HASWELL/[10SC1-F01150-11R_10SC1-F01150-12R]

LGA1155 (G,H,I)

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

VCore CAP (X18)

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

DDR CAP (X9)

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

Gigabyte Technology

Title	CPU LGA1150-C	
Size: Custom	Document Number: GA-H81M-D2W WG	Rev: 1.01
Date: Tuesday, December 31, 2013	Sheet 6 of 33	

DDR3 (A)

DDR3_1

DDRVTT

DDR_15V

N_SMBDATA
N_SMBCLK

MC10 100p/4/NPO/50V/J/X
MC11 100p/4/NPO/50V/J/X

VCC3 MR17 0/6 VDDSPD_A

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

MC5 VREF_DDRA
MC1 VREF_DDDRA
0.1u/4/X7R/16V/K

(8,12,14,15,19) N_SMBCLK
(8,12,14,15,19) N_SMBDATA

(5) SBAA2 SBAA1 SBAA0

(5) CKEA1 CKEA0

(5) -CSA1 -CSA0

(5) -DCLKA1 DCLKA1

(5) -DCLKA0 DCLKA0

(5) MAAA[0..15]

(5,8) -DDR3_RST
(5) -SCASA
(5) -SRASA
(5) -SWEA

-DDR3_RST
MC6 100p/4/NPO/50V/J

Pin	Signal
120, 240	VTT
2, 5, 8, 11, 14, 17, 20, 23, 26, 29, 32, 35, 38, 41, 44, 47, 80, 83, 86, 89, 92, 95, 98, 101, 104, 107, 110, 113, 116, 119, 121, 124, 127, 130, 133, 136, 139, 142, 145, 148, 151, 154, 157, 160, 163, 166, 199, 202, 205, 208, 211, 214, 217, 220, 223, 226, 229, 232, 235, 239	VSS
51, 54, 57, 60, 62, 65, 66, 69, 72, 75, 78, 170, 173, 176, 179, 182, 183, 186, 189, 191, 194, 197	VDD
236	VDDSPD
67	VREFCA
1	VREFDQ
118	SCL
238	SDA
237	SA1
117	SA0
52, 190, 71	BA2, BA1, BA0
169, 50	CKE1, CKE0
76, 193	S1*, S0*
64, 63	CK1/NU*, CK1/NU
185, 184	CK0*, CK0
188, 181, 61, 180, 59, 58, 178, 56, 177, 175, 70, 55, 174, 196, 172, 171	A0, A1, A2, A3, A4, A5, A6, A7, A8, A9, A10/AP, A11, A12, A13, A14, A15
168, 74, 192, 73	RESET*, CAS*, RAS*, WE*
48, 49, 187, 198	FREE
79	RSVD
77, 195	ODT1, ODT0
68, 53, 167	NC/PAR_IN, NC/ERR_OUT, NC/TEST4
39, 40, 45, 46, 158, 159, 164, 165	CB0, CB1, CB2, CB3, CB4, CB5, CB6, CB7
7, 6	DQS0, DQS0*
16, 15	DQS1, DQS1*
25, 24	DQS2, DQS2*
34, 33	DQS3, DQS3*
85, 84	DQS4, DQS4*
94, 93	DQS5, DQS5*
103, 102	DQS6, DQS6*
112, 111	DQS7, DQS7*
43, 42	DQS8, DQS8*
125, 126	DM0/DQS9, NC/DQS9*
134, 135	DM1/DQS10, NC/DQS10*
143, 144	DM2/DQS11, NC/DQS11*
152, 153	DM3/DQS12, NC/DQS12*
203, 204	DM4/DQS13, NC/DQS13*
212, 213	DM5/DQS14, NC/DQS14*
221, 222	DM6/DQS15, NC/DQS15*
230, 231	DM7/DQS16, NC/DQS16*
161, 162	DM8/DQS17, NC/DQS17*
3, 4, 9, 10, 122, 123, 128, 129, 12, 13, 18, 19, 131, 132, 137, 138, 21, 22, 27, 28, 140, 141, 146, 147, 30, 31, 36, 37, 149, 150, 155, 156, 81, 82, 87, 88, 200, 201, 206, 207, 90, 91, 96, 97, 209, 210, 215, 216, 99, 100, 105, 106, 218, 219, 224, 225, 108, 109, 114, 115, 227, 228, 233, 234	DQ0, DQ1, DQ2, DQ3, DQ4, DQ5, DQ6, DQ7, DQ8, DQ9, DQ10, DQ11, DQ12, DQ13, DQ14, DQ15, DQ16, DQ17, DQ18, DQ19, DQ20, DQ21, DQ22, DQ23, DQ24, DQ25, DQ26, DQ27, DQ28, DQ29, DQ30, DQ31, DQ32, DQ33, DQ34, DQ35, DQ36, DQ37, DQ38, DQ39, DQ40, DQ41, DQ42, DQ43, DQ44, DQ45, DQ46, DQ47, DQ48, DQ49, DQ50, DQ51, DQ52, DQ53, DQ54, DQ55, DQ56, DQ57, DQ58, DQ59, DQ60, DQ61, DQ62, DQ63

MDA[0..63] (5)

DDR3/240/BK/VA/D

BLACK CONNECTOR

MODT_A[0..1] MODT_A[0..1] (5)
-DQSA[0..7] -DQSA[0..7] (5)
DQSA[0..7] DQSA[0..7] (5)

DDR3 VREF

DDR_15V
MR15 1K/4/1
MR14 1K/4/1
VREF_DDRA

DDR_15V
MR4 1K/4/1
MR5 1K/4/1
MR1 10/4
VREF_DDDRA
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 MBC2 MBC3 MBC24 MBC12 MBC14 0.1u/4/X7R/16V/K

DDR_15V
MBC15 MBC17 MBC27 MBC29 MBC35 MBC36 MBC37 MBC47 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-D2W WG | Rev: 1.01

Date: | Sheet 7 of 33

DDR3 (B)

DDR3_2

DDRVTT

DDR_15V

MR18 0/4 VCC3 VDDSPD_B

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

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

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

(7,12,14,15,19) N_SMBCLK N_SMBDATA VDDSPD_B

(5) SBAB2 SBAB1 SBAB0

(5) CKEB1 CKEB0

(5) -CSB1 -CSB0

(5) -DCLKB1 DCLKB1

(5) -DCLKB0 DCLKB0

(5) MAAB[0..15]

(5,7) -DDR3_RST

(5) -SCASB -SRASB -SWEB

VTT	120, 240	FREE	48, 49, 187, 198		
VSS	2, 5, 8, 11, 14, 17, 20, 23, 26, 29, 32, 35, 38, 41, 44, 47, 80, 83, 86, 89, 92, 95, 98, 101, 104, 107, 110, 113, 116, 119, 121, 124, 127, 130, 133, 136, 139, 142, 145, 148, 151, 154, 157, 160, 163, 166, 199, 202, 205, 208, 211, 214, 217, 220, 223, 226, 229, 232, 235, 239	RSVD	79		
VDD	51, 54, 57, 60, 62, 65, 66, 69, 72, 75, 78, 170, 173, 176, 179, 182, 183, 186, 189, 191, 194, 197	ODT1	77	MODT_B1	
		ODT0	195	MODT_B0	
VDDSPD	236	NC/PAR_IN	68		
VREFCA	67	NC/ERR_OUT	53		
VREFDQ	1	NC/TEST4	167		
SCL	118	CB0	39		
SDA	238	CB1	40		
SA1	237	CB2	45		
SA0	117	CB3	46		
BA2	52	CB4	158		
BA1	190	CB5	159		
BA0	71	CB6	164		
CKE1	169	CB7	165		
CKE0	50	DQS0	7	DQSB0	
S1*	76	DQS0*	6	-DQSB0	
S0*	193	DQS1	16	DQSB1	
CK1/NU*	64	DQS1*	15	-DQSB1	
CK1/NU	63	DQS2	25	DQSB2	
CK0*	185	DQS2*	24	-DQSB2	
CK0	184	DQS3	34	DQSB3	
A0	188	DQS3*	33	-DQSB3	
A1	181	DQS4	85	DQSB4	
A2	61	DQS4*	84	-DQSB4	
A3	180	DQS5	94	DQSB5	
A4	59	DQS5*	93	-DQSB5	
A5	58	DQS6	103	DQSB6	
A6	178	DQS6*	102	-DQSB6	
A7	56	DQS7	112	DQSB7	
A8	177	DQS7*	111	-DQSB7	
A9	175	DQS8	43		
A10/AP	70	DQS8*	42		
A11	55	DM0/DQS9	125		
A12	174	NC/DQS9*	126		
A13	196	DM1/DQS10	134		
A14	172	NC/DQS10*	135		
A15	171	DM2/DQS11	143		
RESET*	168	NC/DQS11*	144		
CAS*	74	DM3/DQS12	152		
RAS*	192	NC/DQS12*	153		
WE*	73	DM4/DQS13	203		
		NC/DQS13*	204		
		DM5/DQS14	212		
		NC/DQS14*	213		
		DM6/DQS15	221		
		NC/DQS15*	222		
		DM7/DQS16	230		
		NC/DQS16*	231		
		DM8/DQS17	161		
		NC/DQS17*	162		
		DQ0	3	MDB0	
		DQ1	4	MDB1	
		DQ2	9	MDB2	
		DQ3	10	MDB3	
		DQ4	122	MDB4	
		DQ5	123	MDB5	
		DQ6	128	MDB6	
		DQ7	129	MDB7	
		DQ8	12	MDB8	
		DQ9	13	MDB9	
		DQ10	18	MDB10	
		DQ11	19	MDB11	
		DQ12	131	MDB12	
		DQ13	132	MDB13	
		DQ14	137	MDB14	
		DQ15	138	MDB15	
		DQ16	21	MDB16	
		DQ17	22	MDB17	
		DQ18	27	MDB18	
		DQ19	28	MDB19	
		DQ20	140	MDB20	
		DQ21	141	MDB21	
		DQ22	146	MDB22	
		DQ23	147	MDB23	
		DQ24	30	MDB24	
		DQ25	31	MDB25	
		DQ26	36	MDB26	
		DQ27	37	MDB27	
		DQ28	149	MDB28	
		DQ29	150	MDB29	
		DQ30	155	MDB30	
		DQ31	156	MDB31	
		DQ32	81	MDB32	
		DQ33	82	MDB33	
		DQ34	87	MDB34	
		DQ35	88	MDB35	
		DQ36	200	MDB36	
		DQ37	201	MDB37	
		DQ38	206	MDB38	
		DQ39	207	MDB39	
		DQ40	90	MDB40	
		DQ41	91	MDB41	
		DQ42	96	MDB42	
		DQ43	97	MDB43	
		DQ44	209	MDB44	
		DQ45	210	MDB45	
		DQ46	215	MDB46	
		DQ47	216	MDB47	
		DQ48	99	MDB48	
		DQ49	100	MDB49	
		DQ50	105	MDB50	
		DQ51	106	MDB51	
		DQ52	218	MDB52	
		DQ53	219	MDB53	
		DQ54	224	MDB54	
		DQ55	225	MDB55	
		DQ56	108	MDB56	
		DQ57	109	MDB57	
		DQ58	114	MDB58	
		DQ59	115	MDB59	
		DQ60	227	MDB60	
		DQ61	228	MDB61	
		DQ62	233	MDB62	
		DQ63	234	MDB63	

MDB[0..63] (5)

DDR3/240/BK/VA/D

BLACK CONNECTOR

-DQSB[0..7] -DQSB[0..7] (5)

DQSB[0..7] DQSB[0..7] (5)

MODT_B[0..1] MODT_B[0..1] (5)

DDR3 VREF

DDR_15V DDR_15V

MR10 1K/4/1 VREF_DDRB

MR11 1K/4/1

MR8 1K/4/1

MR9 1K/4/1

MR7 10/4 VREF_DQDDRB 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: Custom | Document Number: GA-H81M-D2W WG | Rev: 1.01

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

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

PCIE_PERN_1_USB3_RXN_2 PCIE_PERP_1_USB3_RXP_2 PCIE_PETN_1_USB3_TXN_2 PCIE_PETP_1_USB3_TXP_2 PCIE_PERN_2_USB3_RXN_3 PCIE_PERP_2_USB3_RXP_3 PCIE_PETN_2_USB3_TXN_3 PCIE_PETP_2_USB3_TXP_3

PCIE Only

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

OC0B_GP59 OC1B_GP40 OC2B_GP41 OC3B_GP42 OC4B_GP43 OC5B_GP9 OC6B_GP10 OC7B_GP14

USBRBIASB USBRBIAS

CLKIN_DOT96N CLKIN_DOT96P

H81/S

W=4 mil out of PCH
S=15 mil out of PCH

VCC1_5_PCH — NR50 7.5K/4/1 DMI_COMP — PCIE_COMP — NR40 7.5K/4/1

CK_-SRCCLK_PCH
CK_SRCCLK_PCH

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

N/A

N_-USBOC_F (18,21)
N_-USBOC_R (18)
N_GPIO14
N_USBRBIAS — NR47 22.6/4/1
CK_-DOTCLK
CK_DOTCLK

NR130 8.2K/4 — N_GPIO14 — 3VDUAL

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

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)

PCHF

USB3: USB3_RXN_0 USB3_RXP_0 USB3_TXN_0 USB3_TXP_0 USB3_RXN_1 USB3_RXP_1 USB3_TXN_1 USB3_TXP_1 USB3_RXN_4 USB3_RXP_4 USB3_TXN_4 USB3_TXP_4 USB3_RXN_5 USB3_RXP_5 USB3_TXN_5 USB3_TXP_5

FDILINK: FDI_RXN_0 FDI_RXP_0 FDI_RXN_1 FDI_RXP_1 FDI_CSYNC FDI_INT FDI_RCOMP

FDI_TXN0 FDI_TXP0 FDI_TXN1 FDI_TXP1 FDI_CSYNC — FDI_CSYNC (4) — FDI_INT — FDI_INT (4) — NR29 7.5K/4/1 — VCC1_5_PCH

N/A

VCC3 — NR62 8.2K/4 — NR63 8.2K/4

TACH6_GP70 TACH7_GP71

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

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 AF3 AV21

H81/S

PCH H/S

LOW COST ICH7 HEATSINK

SB_HEATSIN

GRAY HS

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

USB TABLE

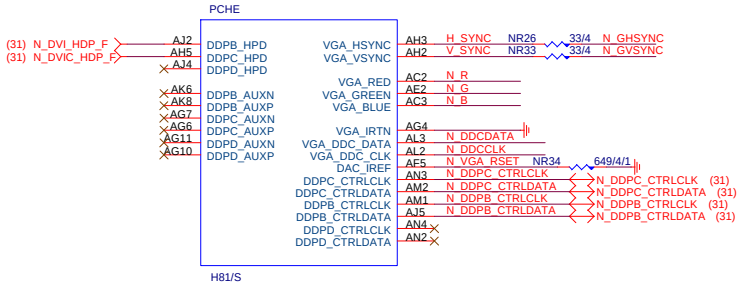
OC[3:0]# for Device 29 (ports 0-7)
OC[7:4]# for Device 26 (ports 8-13)

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

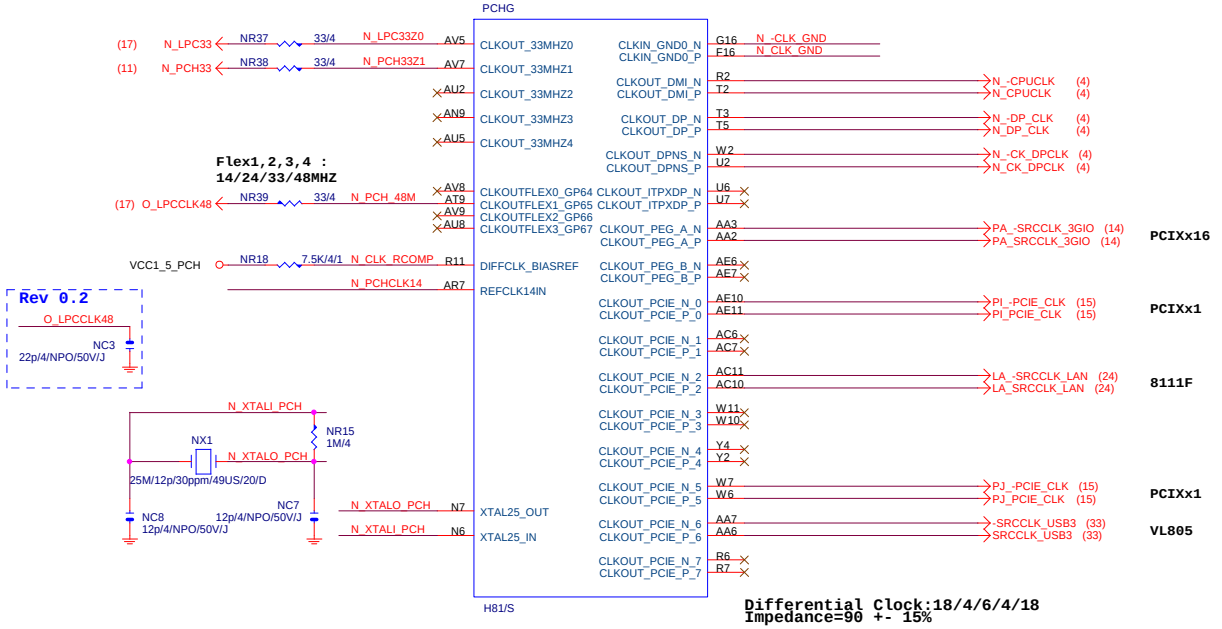
Gigabyte Technology

Title: PCH FDI,DMI,USB ,PCIE,NVRAM
Size: Custom | Document Number: GA-H81M-D2W WG | Rev: 1.01
Date: Tuesday, December 31, 2013 | Sheet 9 of 33

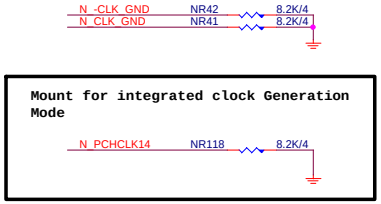
PCH (E)



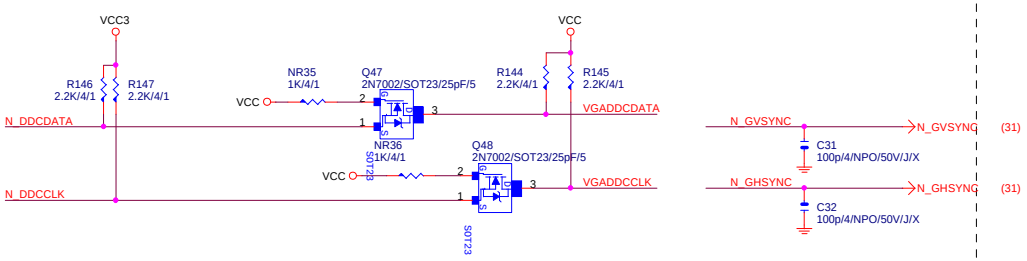
PCH (G)



PCH CLK PD

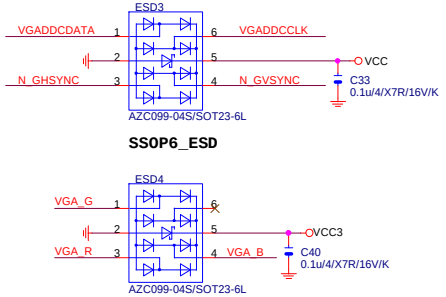


VGA DDC

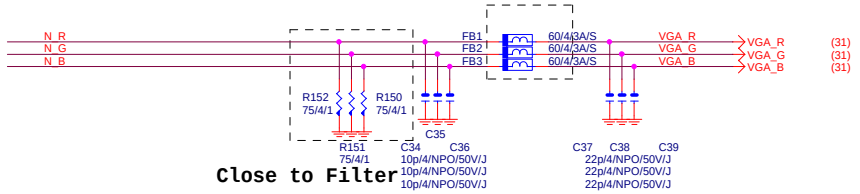


VGA CONNECTOR

VGA ESD



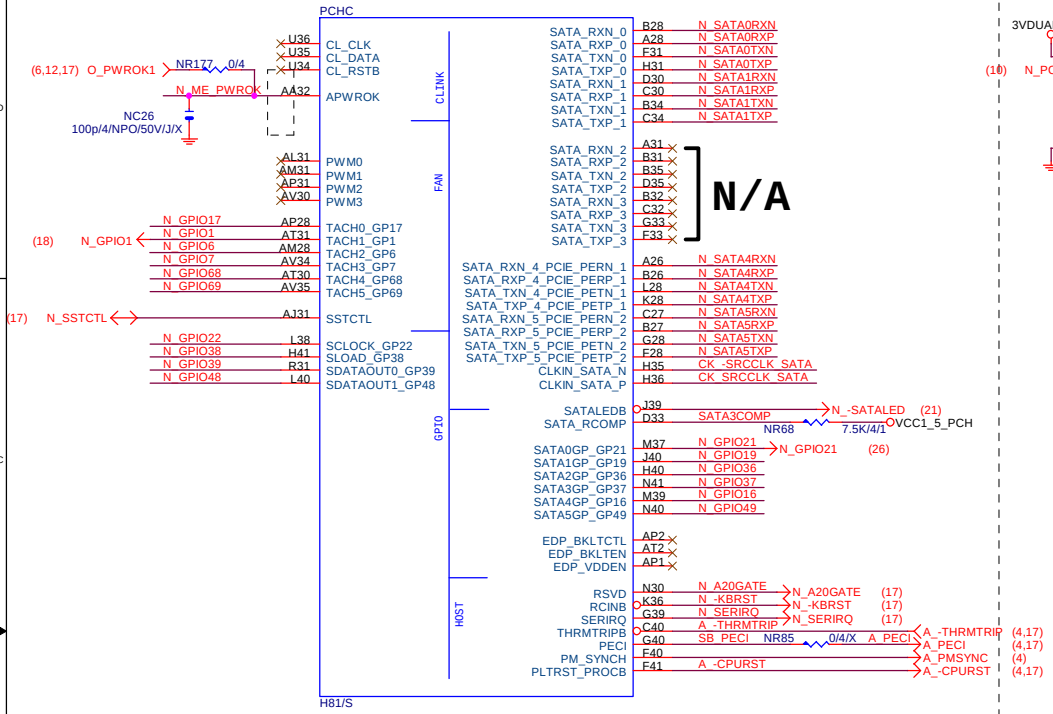
VGA DDC



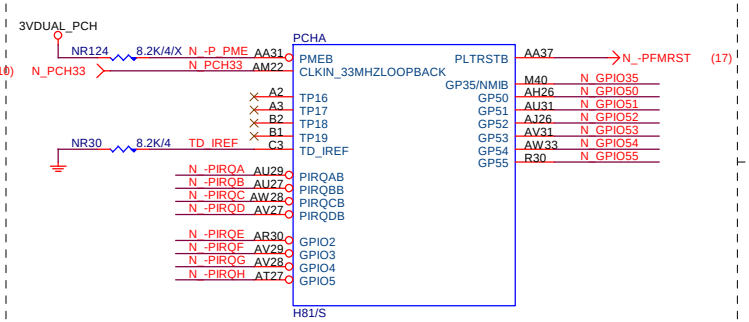
Gigabyte Technology		
Title	PCH DISPLAY ,CLK BUFFER	
Size: Custom	Document Number: GA-H81M-D2W WG	Rev: 1.01
Date: Tuesday, December 31, 2013	Sheet 10 of 33	

PCH (C)

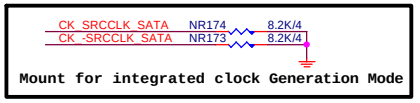
SATA3 : 20/7.5/4.5/7.5/20 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%
SATA2 : 15/7.5/4.5/7.5/15 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%



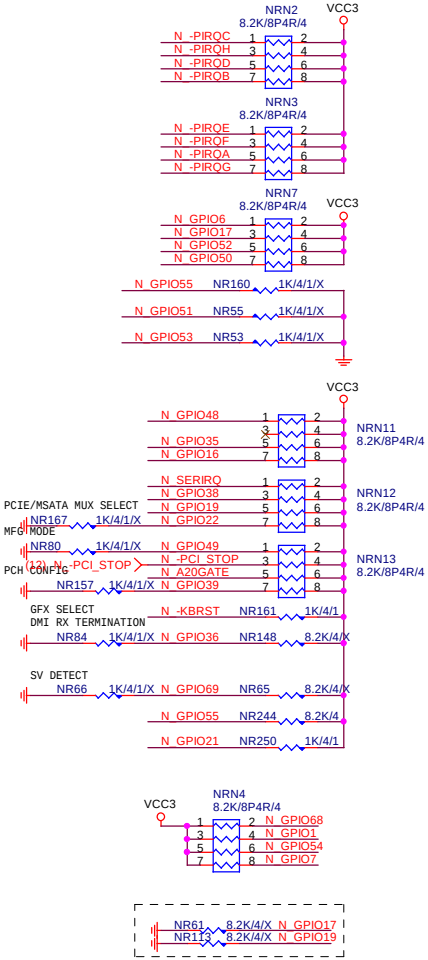
PCH (A)



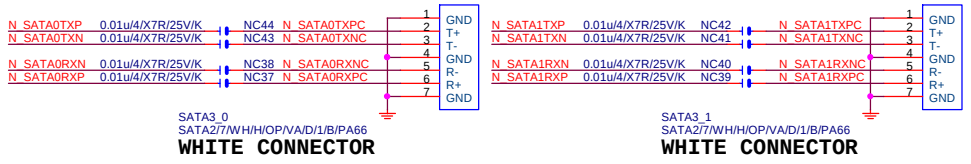
PCH CLK PD



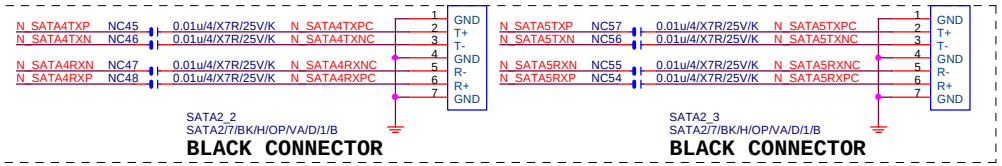
PCH PU/PD



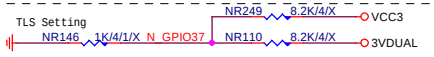
SATA CONNECTOR



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

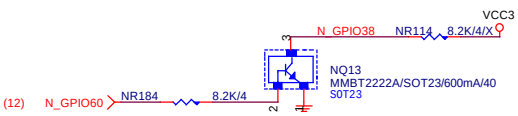


ME PWROK



GPIO37 PU VCC3 ENABLE SBA
For H87&B85

GPIO38 Ctrl



Gigabyte Technology

Title: PCH HOST , SATA, PCI

Size: Custom | Document Number: GA-H81M-D2W WG | Rev: 1.01

Date: Tuesday, December 31, 2013 | Sheet 11 of 33

PCH (D)

PCHD

H81/S

ACZ_SDOUT

SPI OVERRIDE PROTECTION

PCH_DPWROK

for IT8620 Ctrl

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

At least 10ms delay after 3VDUAL_PCH stabel

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

PCH PU/PD

GP8:Low to enable PCH clock chip

SUSCLK:Low to OD PLL VR

GP28:Lo disable VRM ,Hi enable VRM

HSW_STRAP13

32.768KHZ

32.768K/12.5p/20ppm/TF38/35K/D

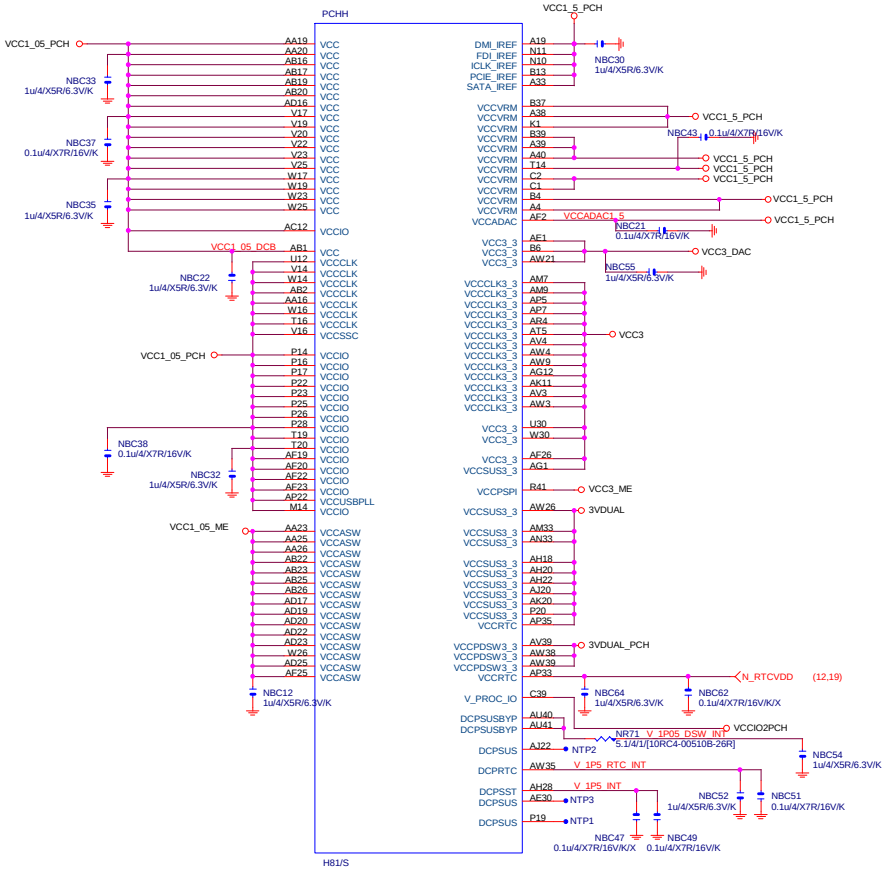
CLR_CMOS

BATTERY-DUAL-4

RB 必须放在BAT外

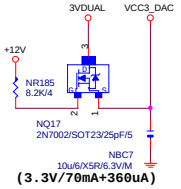
Gigabyte Technology	
Title	PCH GPIO , CTRL , AUDIO
Size: Custom	Document Number: GA-H81M-D2W WG
Rev	1.01
Date: Tuesday, December 31, 2013	Sheet 12 of 33

PCH (H)

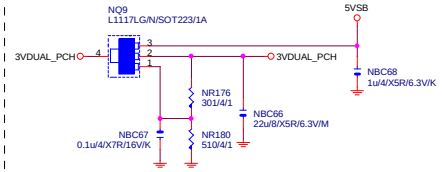


VCC3_DAC

CLOSE北橋(注意震盪水波紋)

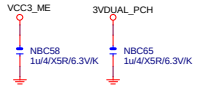


3VDUAL_PCH

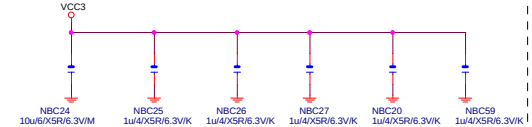


SHT PWR

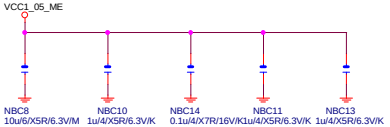
CAP



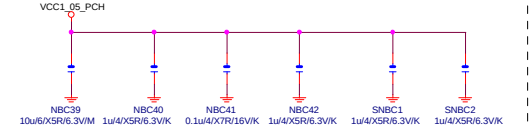
(3.3V)(X6)



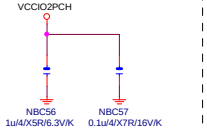
(1.05V)(X5)



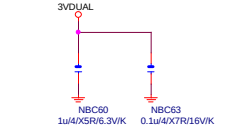
(1.05V)(X6)



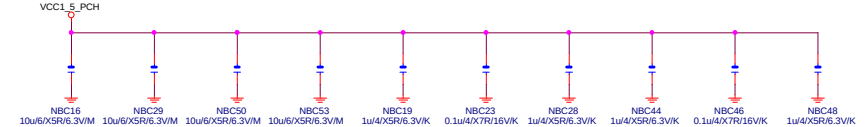
(1.05V)(X2)



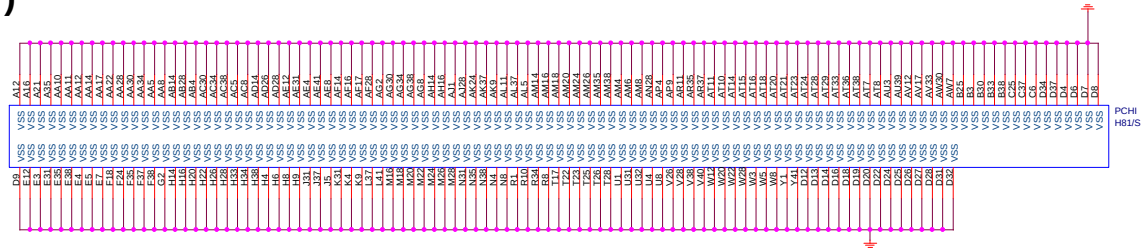
(3.3V)(X2)



(1.05V)(X10)

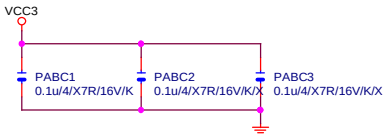


PCH (I)

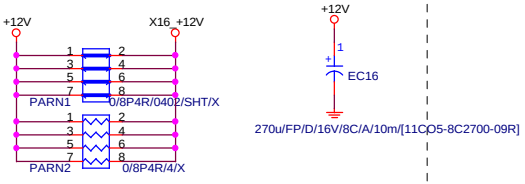


Gigabyte Technology			
Title: PCH PWR ,GND			
Size: Custom	Document Number: GA-H81M-D2W WG		Rev: 1.01
Date: Tuesday, December 31, 2013	Sheet 13 of 33		

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

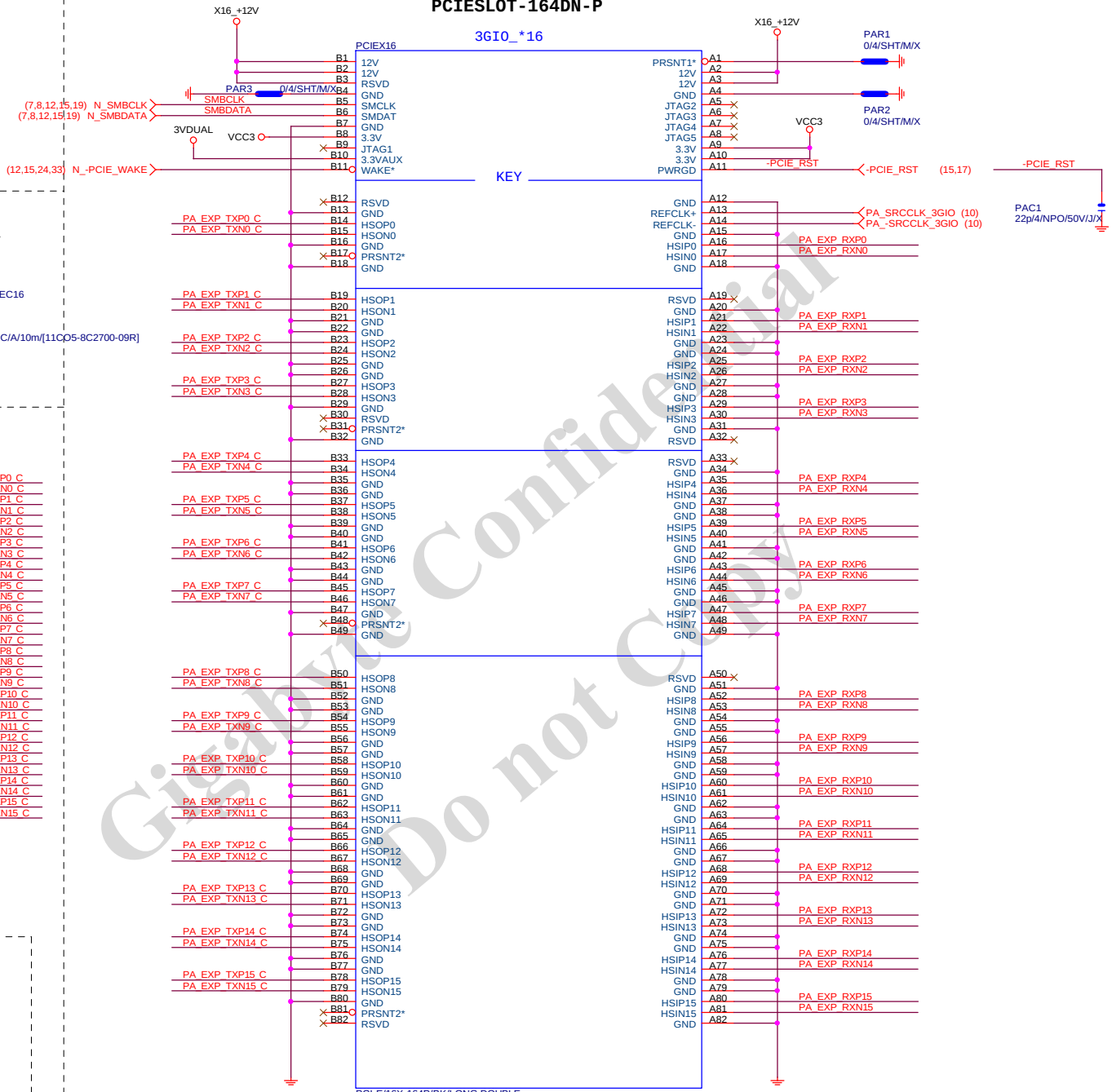
PA_EXP_RXP[0..15] >> PA_EXP_RXP[0..15] (4)
PA_EXP_RXN[0..15] >> PA_EXP_RXN[0..15] (4)
PA_EXP_TXP[0..15] >> PA_EXP_TXP[0..15] (4)
PA_EXP_TXN[0..15] >> PA_EXP_TXN[0..15] (4)

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

PCIEX16 SLOT

PCIESLOT-164DN-P

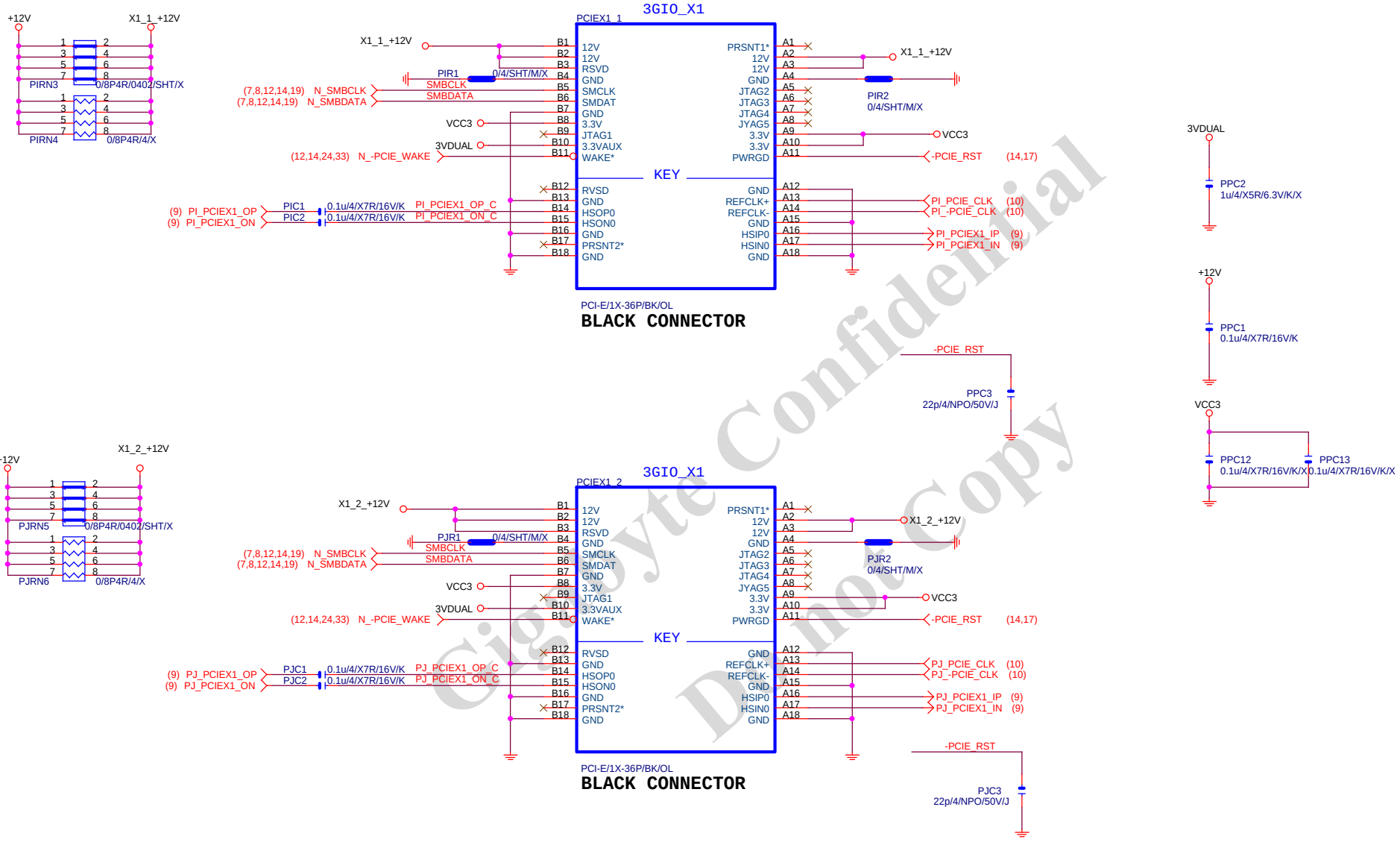
3GIO_*16



BLACK CONNECTOR

Gigabyte Technology		
Title: PCI EXPRESS * 16		
Size: Custom	Document Number: GA-H81M-D2W WG	Rev: 1.01
Date: Tuesday, December 31, 2013	Sheet 14 of 33	

PCIEX1 SLOT



Gigabyte Technology		
Title: PCI EXPRESS X 1 PORT		
Size: Custom	Document Number: GA-H81M-D2W WG	Rev: 1.01
Date: Tuesday, December 31, 2013	Sheet 15 of 33	

Gigabyte Technology			
Title: PCI SLOT 1&2			
Size: Custom	Document Number: GA-H81M-D2W WG		Rev: 1.01
Date: Tuesday, December 31, 2013		Sheet 16 of 33	

SIO IT8620

IT8620E_BX

IT8620E/BX/S

PWR SHT

For 8728 EUP function

3VDUAL_PCH — OR8 0/4 — IT_VCCH

VCC3 — OR9 0/4 — IT_AVCC

SIO PU

IO_GP25 — OR10 1K/4/1 — 3VDUAL_PCH

DS_ME — OR11 1K/4/1 — 3VDUAL_PCH

SVID_CTRL — OR12 8.2K/4 — 3VDUAL_PCH

-PROCHOT_CON — OR13 8.2K/4 — VCC3

N_-LDRQ0 — OR14 1K/4/1 — VCC3

ITE_PWROK2 — OR15 1K/4/1 — VCC3

ITE_PWROK1 — OR16 1K/4/1 — VCC3

-PCIE_RST — OR17 1K/4/1 — VCC3

-PFMRST2 — OR18 1K/4/1 — VCC3

(19) FANPWM1 — FANPWM1 — OR19 8.2K/4 — VCC

(19) FANPWM2 — FANPWM2 — OR20 8.2K/4 — VCC

SIO STRAP

H61M-S2 1.1 JP6 stuff pull down

JP2 — OR21 8.2K/4 — VCC3

JP3 — OR22 8.2K/4 — VCC3

JP4 — OR23 8.2K/4 — VCC3

JP5 — OR24 8.2K/4/X — VCC3

OR25 8.2K/4/X

ITE recommand

EUP control by PCH

3VDUAL — OR26 100/4/1 — 28_3VSB

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

Power leakage

IT_AVCC — OQ1 2N7002/SOT23/25pF/5 — -PSON

SOT23

OR27 510/4/1

For IT8721 Power leakage

PRCOHOT

-THRMTRIP

DUAL BIOS OPT STRAP

-CASEOPEN — OC6 1u/4/X5R/6.3V/K

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

SIO_18V

internal power pin, max 22nF cap

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

MB ID

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

SIO CAP

IT_VCCH — OC9 1u/4/X5R/6.3V/K — OC10 0.1u/4/X7R/16V/K/X

IT_VCCH — OC11 10u/6/X5R/6.3V/M

3VDUAL — OC12 1u/4/X5R/6.3V/K

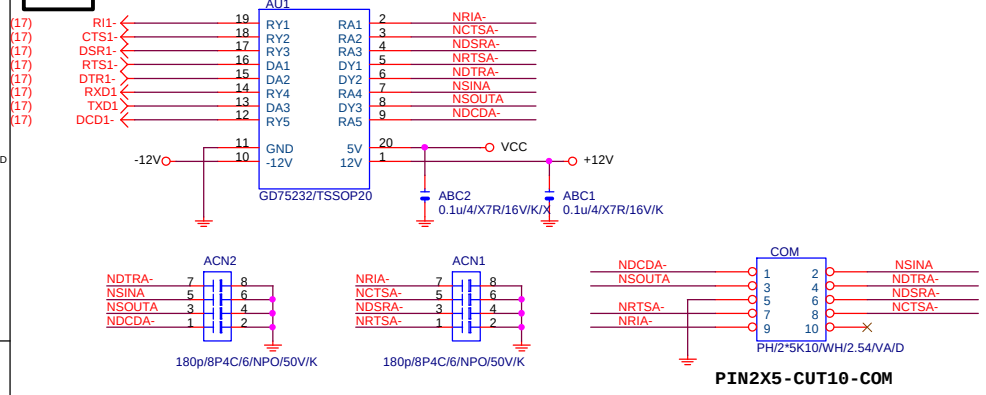
IT_AVCC — OC13 10u/6/X5R/6.3V/M

3VDUAL_PCH — OC14 0.1u/4/X7R/16V/K

VREF_25 — OC15 0.1u/4/X7R/16V/K

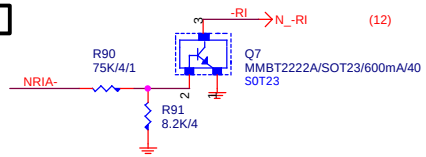
Gigabyte Technology	
Title	PCH GPIO , CTRL , AUDIO
Size C	Document Number GA-H81M-D2W WG
Rev	1.01
Date: Tuesday, December 31, 2013	Sheet 17 of 33

COM

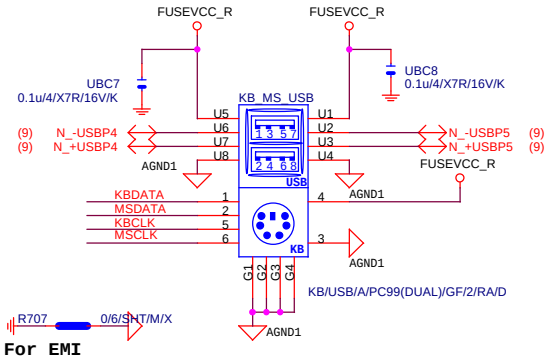


PIN2X5-CUT10-COM

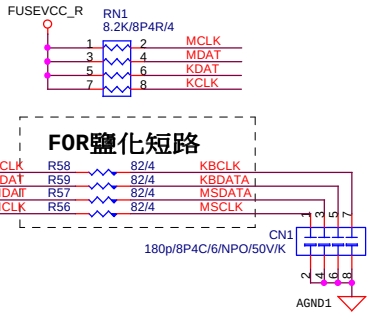
COM RI



KB/MS

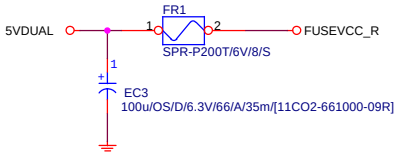


For EMI



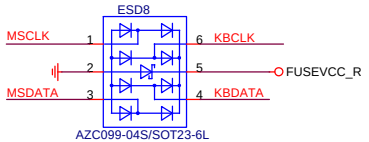
USB2.0 PWR

FUSE-0805
KB_MS_USB 2-Port 2.0A

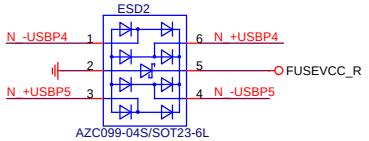


Close to connector

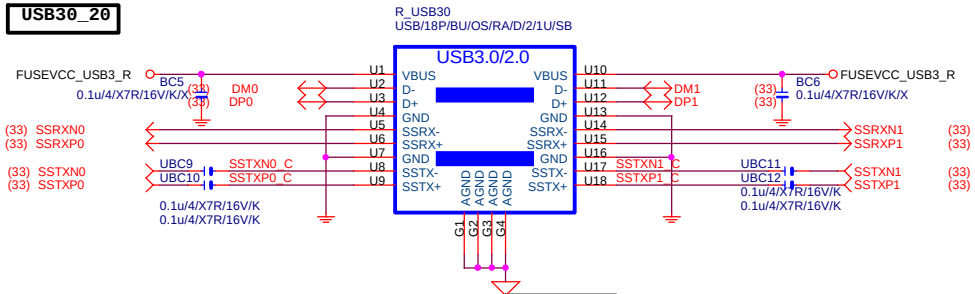
KB/MS ESD



USB2.0 ESD

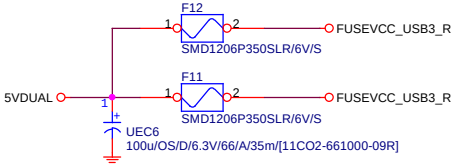


USB30_20



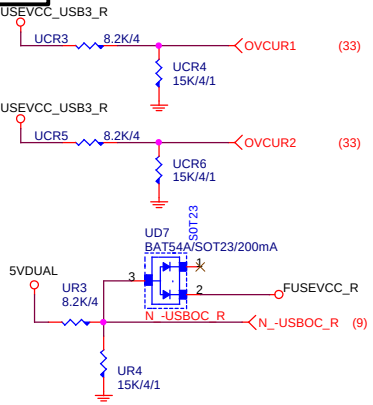
USB30_20 PWR

Polyswitch-1206



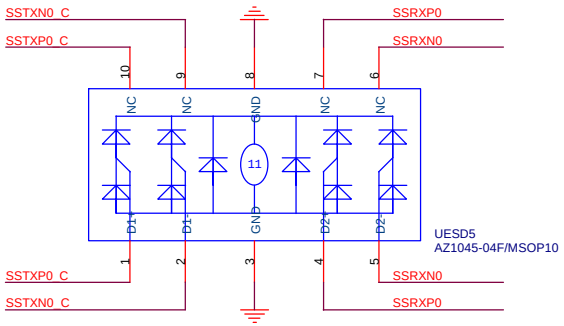
USB3.0 1Port - 1Fuse (3.5A)

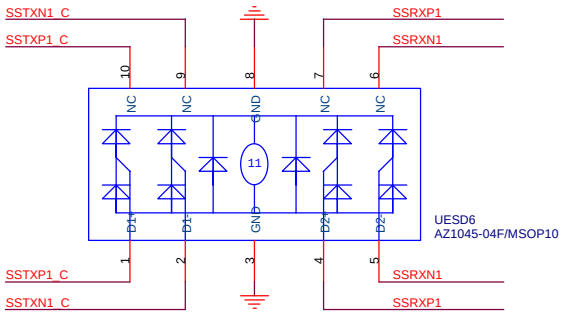
-USBOC_R



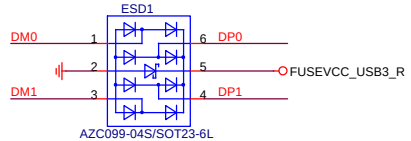
USB30_20 ESD PROCTECT

USB3.0 ESD

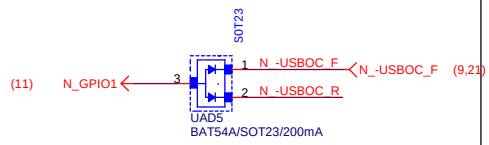




USB2.0 ESD



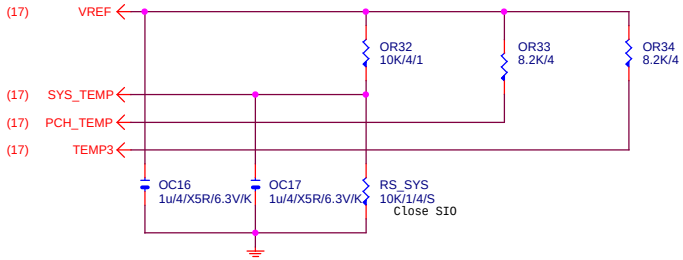
USB POWER PROTECT



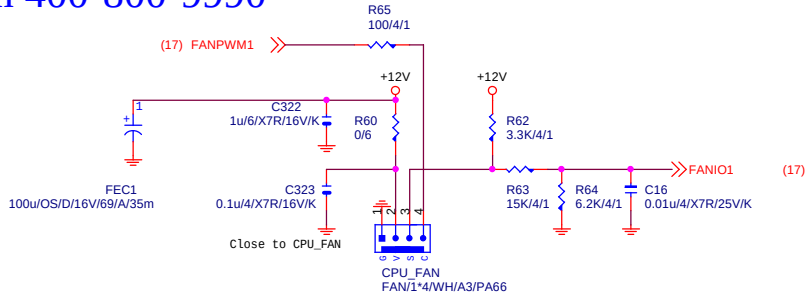
Gigabyte Technology

Title	COM,-RI,KB_USB,USB_ESATA,-PROCHOT	
Size: Custom	Document Number: GA-H81M-D2W WG	Rev: 1.01
Date: Tuesday, December 31, 2013	Sheet 18 of 33	

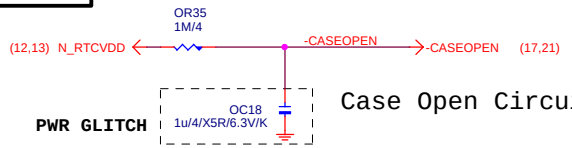
TEMP H/W MONITOR



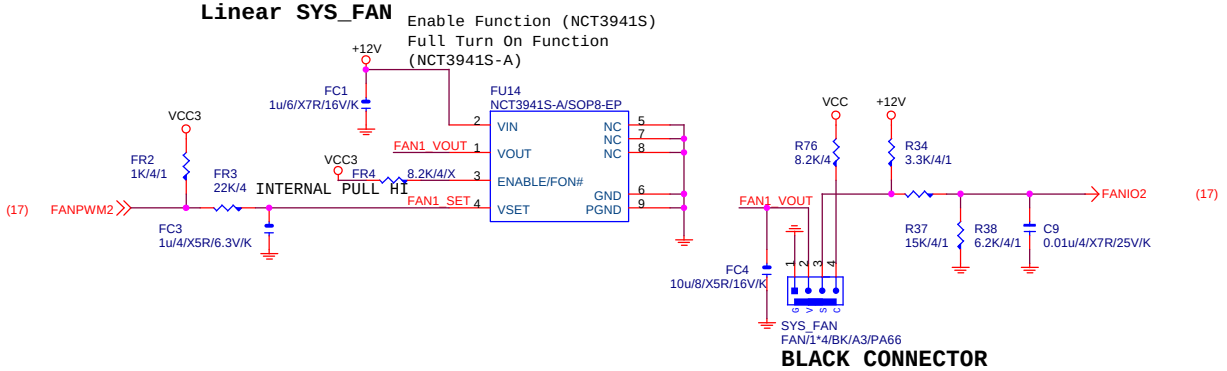
CPU SMART FAN



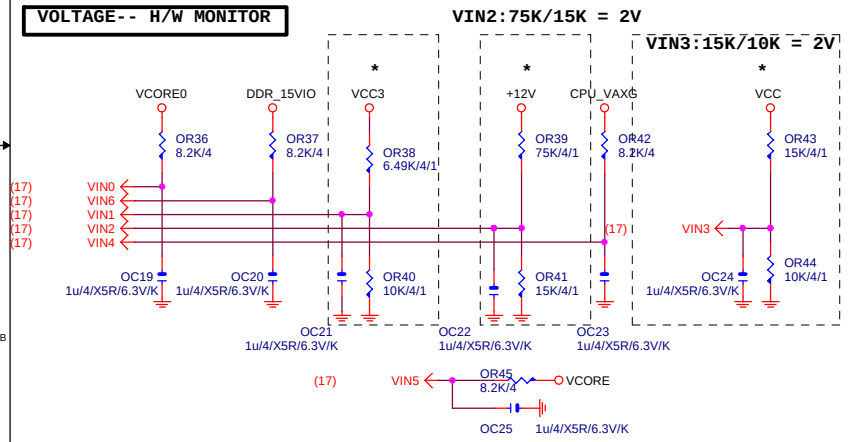
CASE OPEN



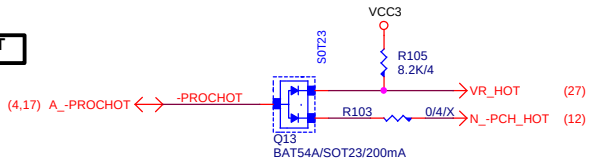
SYS SMART FAN

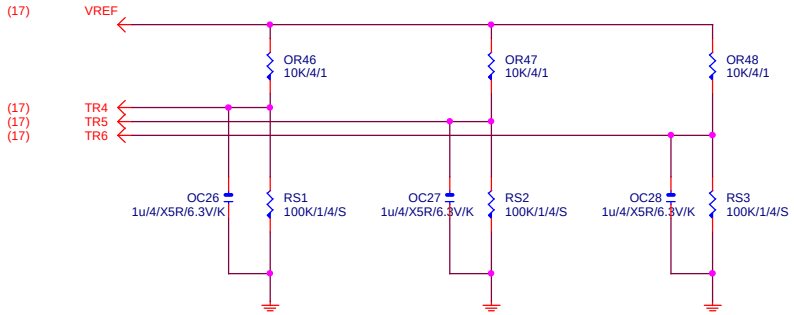


VOLTAGE-- H/W MONITOR



-PROHOT

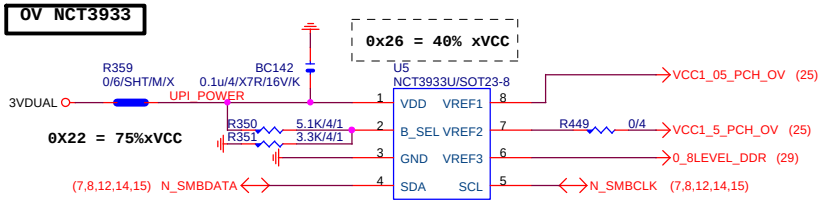




RS1、RS2、RS3 CLOSE CPU
VR MOSFET

接pwm feedback pin

OV NCT3933



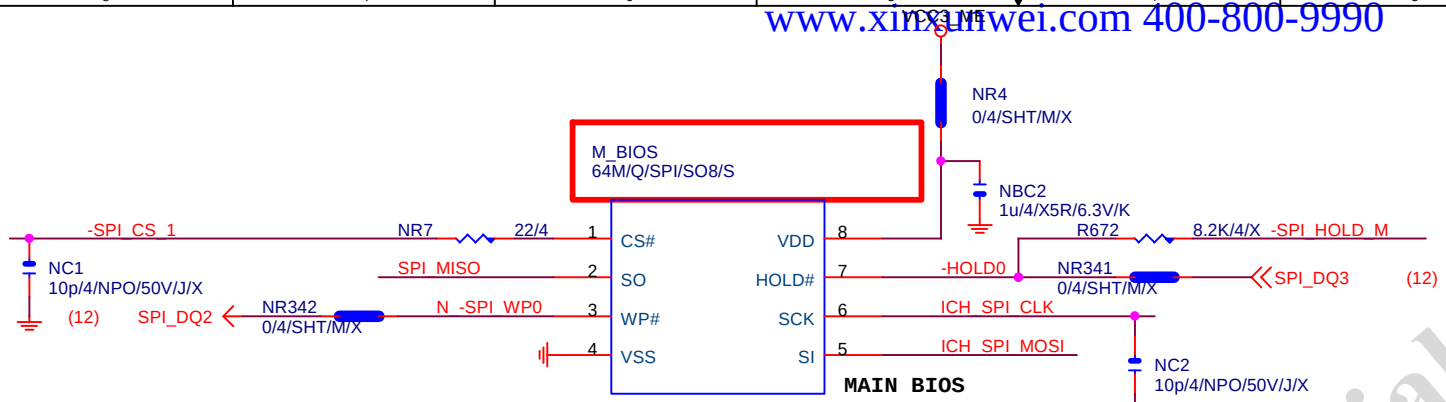
NCT3933	0X2A	0X20	0X22
VREF1	DDRVTT	VREF_DDRA_DQ	PCH Core
VREF2	VREF_DDRA_CA	N/A	VCC1_5_PCH
VREF3	VREF_DDRA_CA	VREF_DDRB_DQ	SMREF

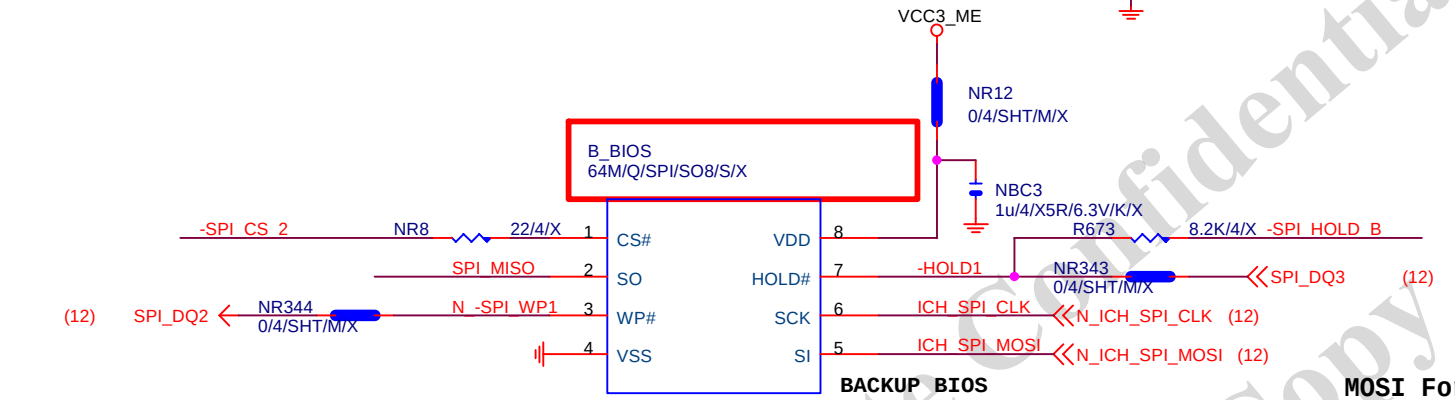
Gigabyte Technology

Title: HWM,FAN CTRL,OV

Size: Custom | Document Number: GA-H81M-D2W WG | Rev: 1.01

Date: Tuesday, December 31, 2013 | Sheet 19 of 33

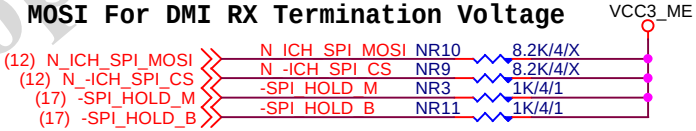


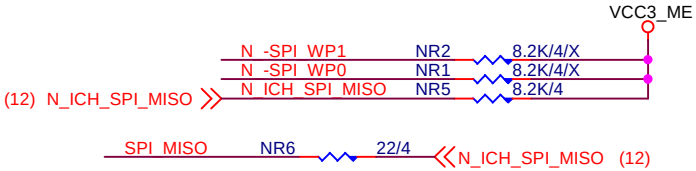


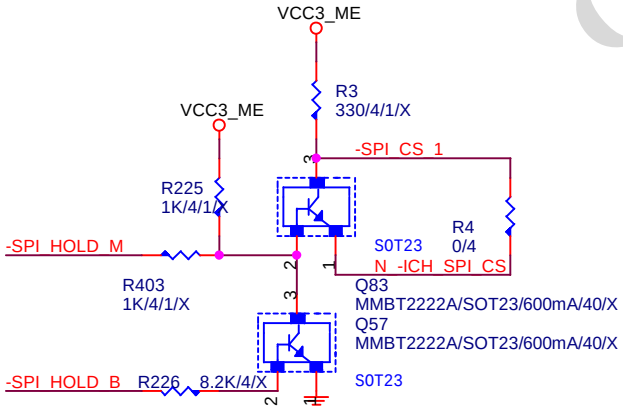
BOOT DEVICE	GNT0	GNT1
LPC	0	0
PCI	0	1
NAND	1	0
SPI	1	1

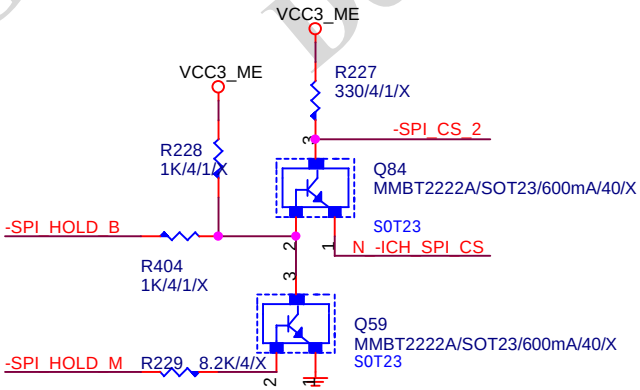
1 means floating
0 means PD 1K

MOSI For DMI RX Termination Voltage

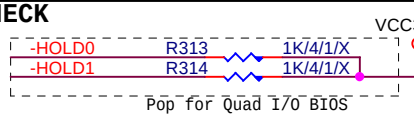








CHECK



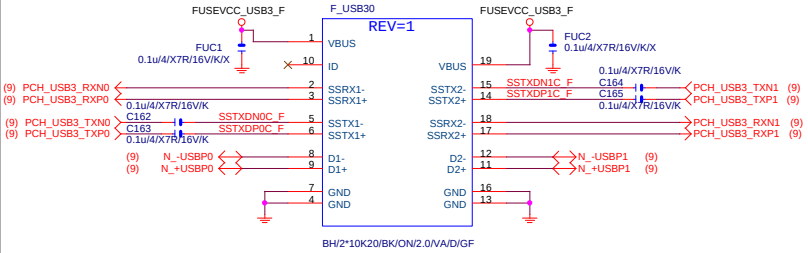
Gigabyte Technology

Title: **DUAL BIOS**

Size: Custom | Document Number: **GA-H81M-D2W WG** | Rev: **1.01**

Date: Tuesday, December 31, 2013 | Sheet 20 of 33

F_USB30

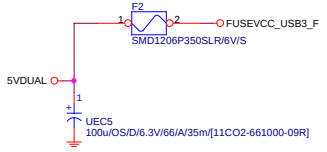


BH/2*10K20/BK/ON/2.0/VA/D/GF

BLACK CONNECTOR

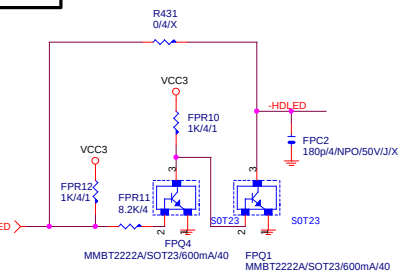
F_USB30 PWR

Polyswitch-1206

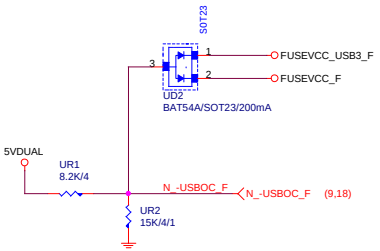


USB3.0 1Port - 1Fuse (3.5A)

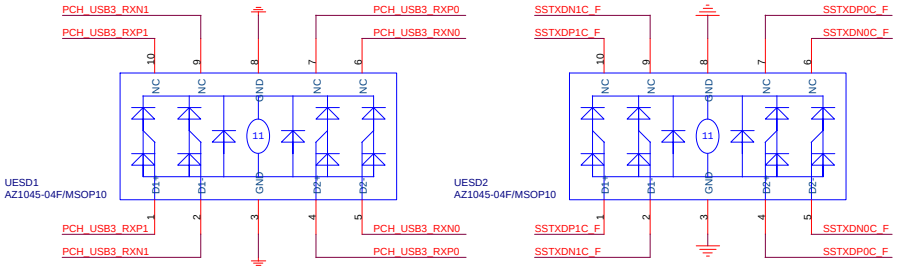
SATA LED

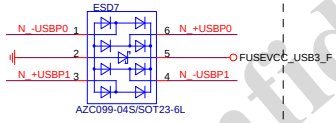


-USBOC_F



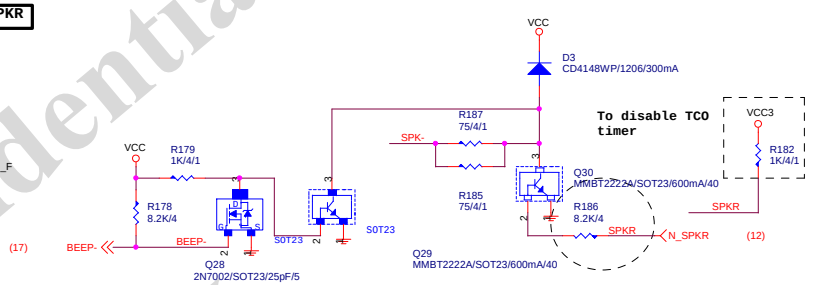
F_USB30 ESD PROTECT



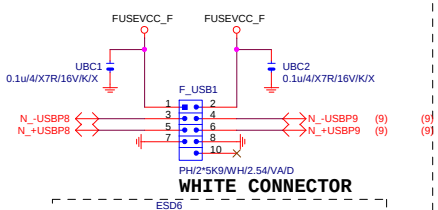


Close to connector

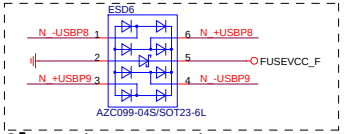
SPKR



FRONT USB1

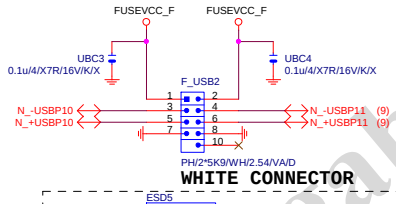


WHITE CONNECTOR

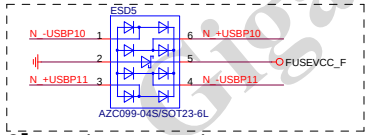


Close to connector

FRONT USB2

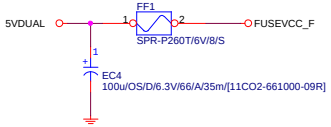


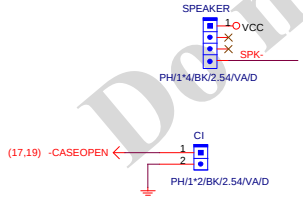
WHITE CONNECTOR



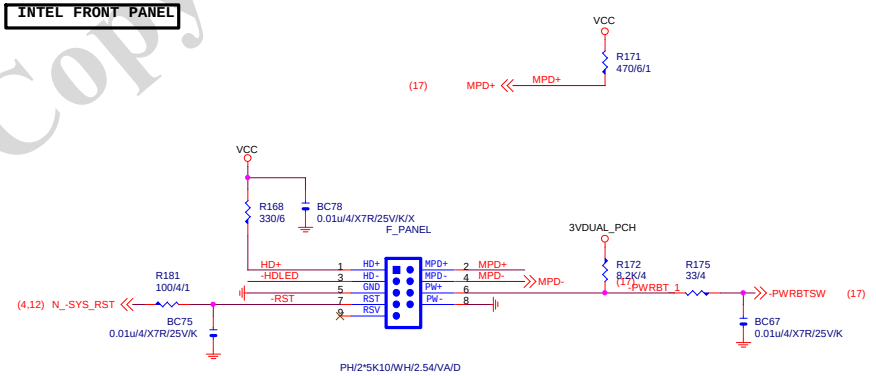
Close to connector

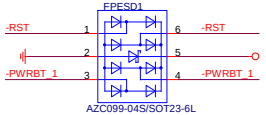
FUSE-0805
F_USB1, F_USB2 4-Port 2.6A





INTEL FRONT PANEL

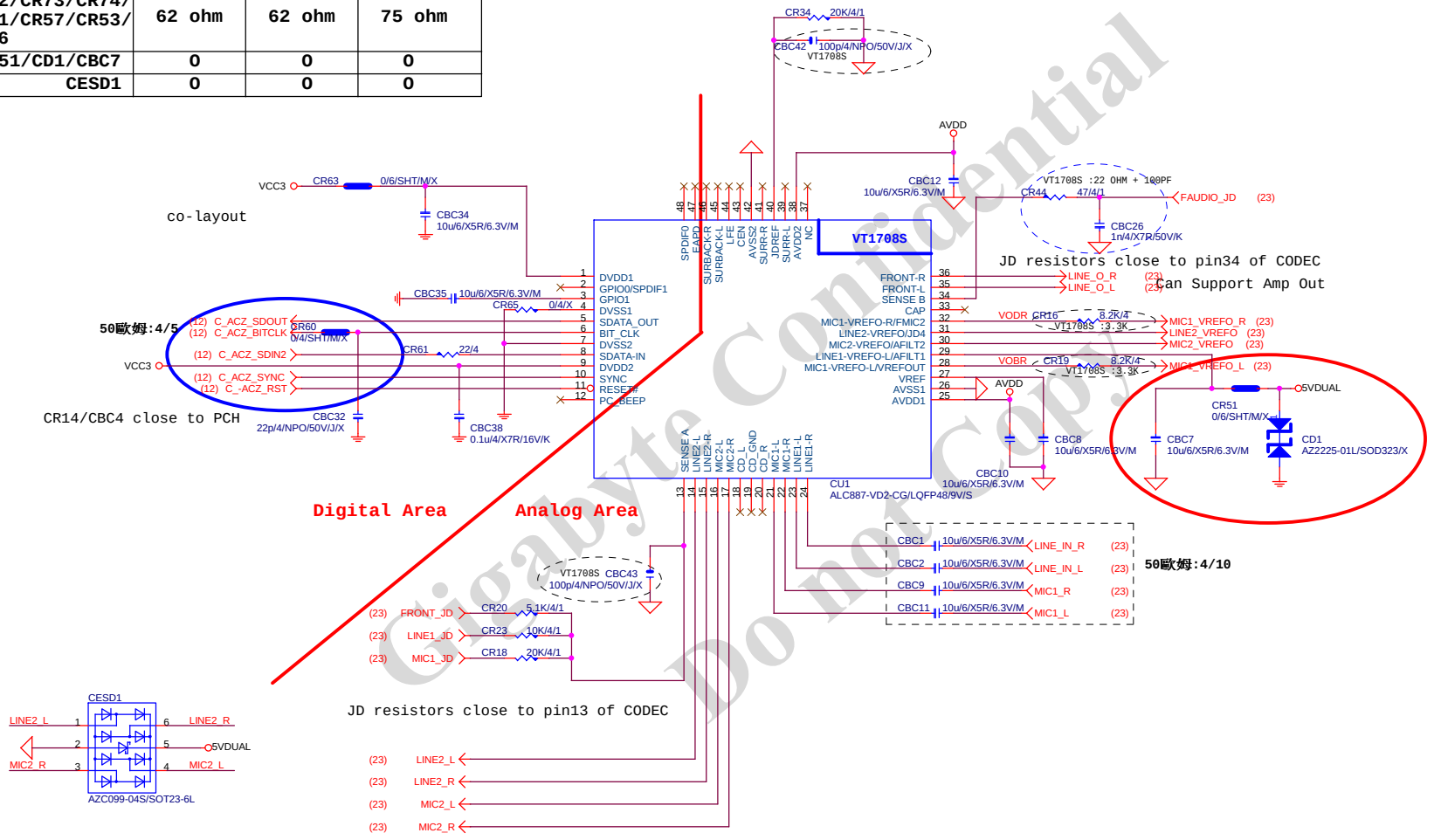




Gigabyte Technology		
Title: FP,F_USB,USB PWR,SPKR,SATA LED		
Size: Custom	Document Number: GA-H81M-D2W WG	Rev: 1.01
Date: Tuesday, December 31, 2013	Sheet 21 of 33	

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

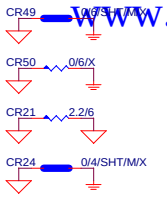


Gigabyte Technology

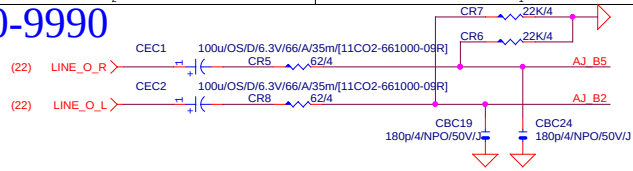
Title: HD AUDIO ALC887B-VD2/VT1708S/VT2021

Size: Custom | Document Number: GA-H81M-D2W WG | Rev: 1.01

Date: Tuesday, December 31, 2013 | Sheet 22 of 33

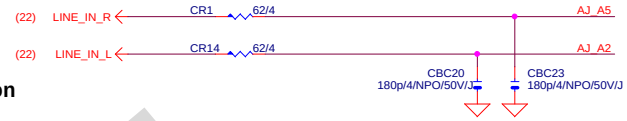


LINE-OUT



Only reserved for ALC888

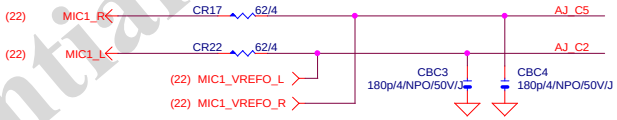
LINE-IN



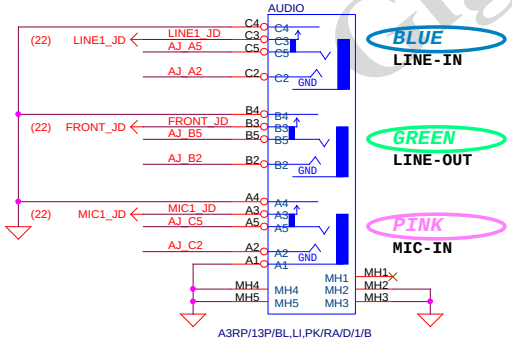
Verify MIC function in LINE-in

For 889A/888

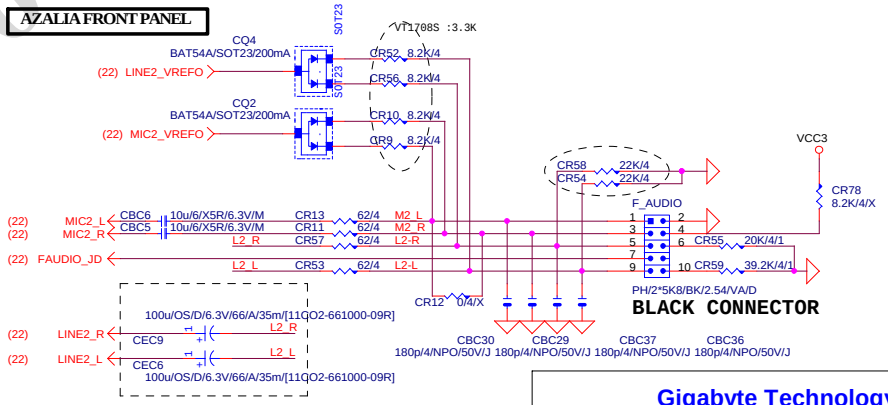
MIC-IN



SPDIF_OUT

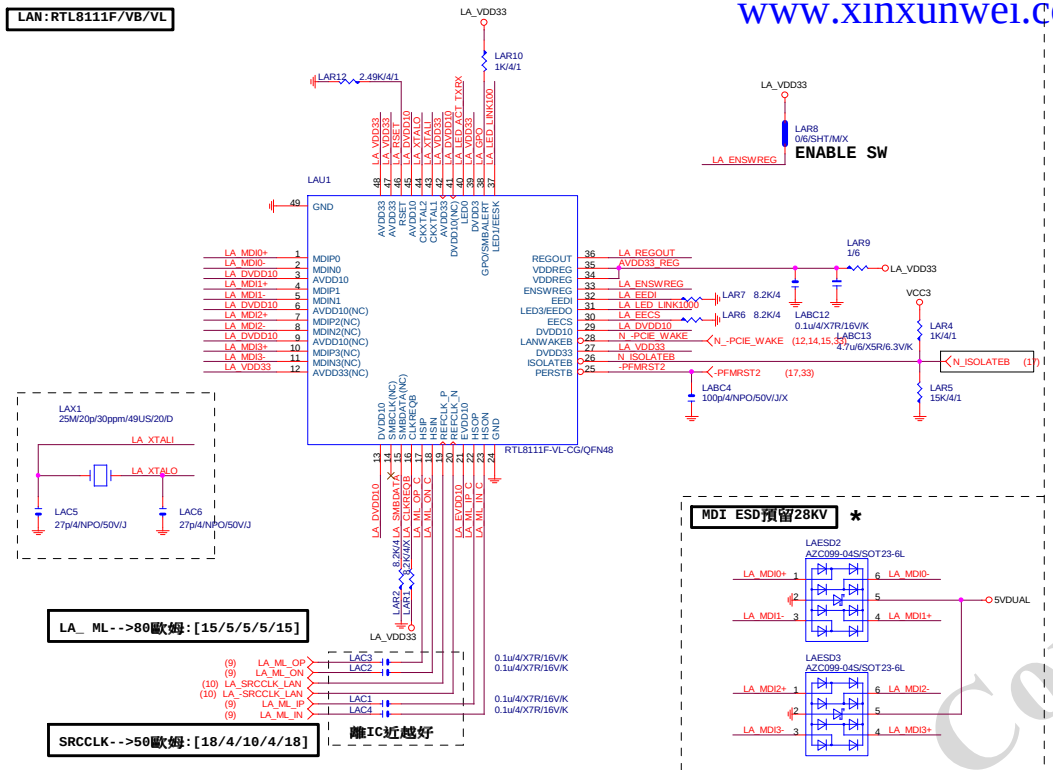


AZALIA FRONT PANEL



Gigabyte Technology		
Title: AUDIO JACK		
Size: Custom	Document Number: GA-H81M-D2W WG	Rev: 1.01
Date: Tuesday, December 31, 2013	Sheet 23 of 33	

LAN:RTL8111F/VB/VL



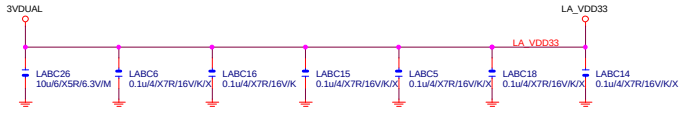
LA_ ML-->80歐姆:[15/5/5/5/15]

SRCCLK-->50歐姆:[18/4/10/4/18]

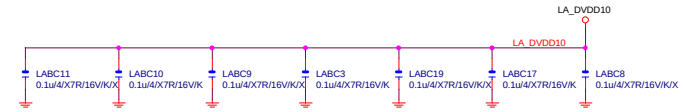
ENABLE SW

MDI ESD預留28KV *

LAN POWER

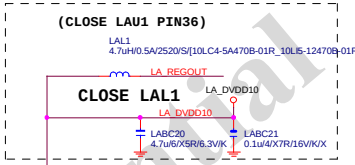


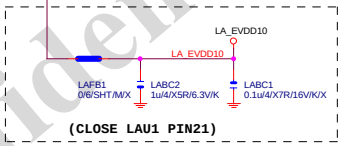
(CLOSE LAU1 PIN:12,27,39,42,47,48)



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

(CLOSE LAU1 PIN36)





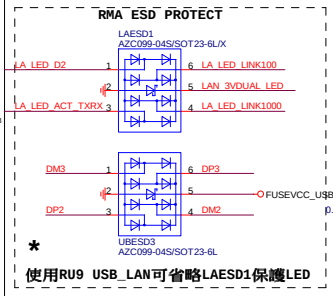
(CLOSE LAU1 PIN21)

Power domain chart

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

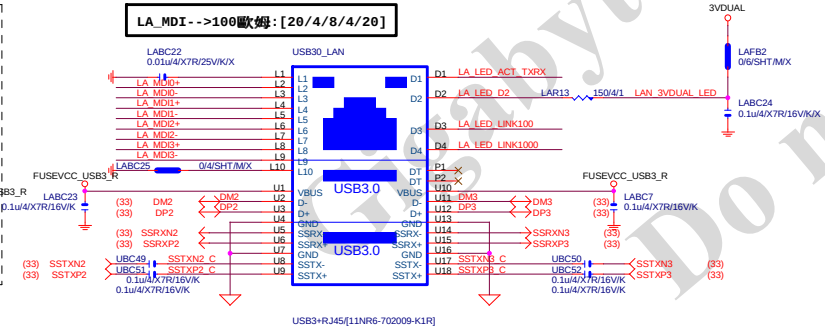
USB_LAN CONNECTOR

RMA ESD PROTECT



* 使用RU9 USB_LAN可省略LAESD1保護LED

LA_MDI-->100歐姆:[20/4/8/4/20]

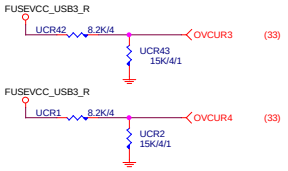


注意:USB PORT(目前:暫代6,7PORT)
USB-->90歐姆:[15/4.5/7.5/4.5/15]

USB X3 POWER

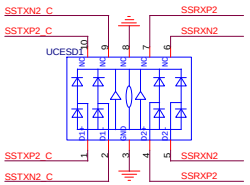
Polyswitch-1206

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

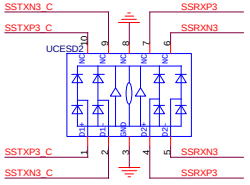


EMI SHORT PAD

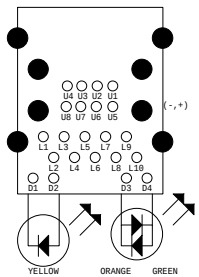
PS:視EMI需求



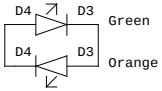
Close to connector



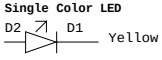
Close to connector



Dual Color LED



Single Color LED



BOM NOTICE *

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

[LED獨立走線,可省略外加AZC099料件LAESD1]

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

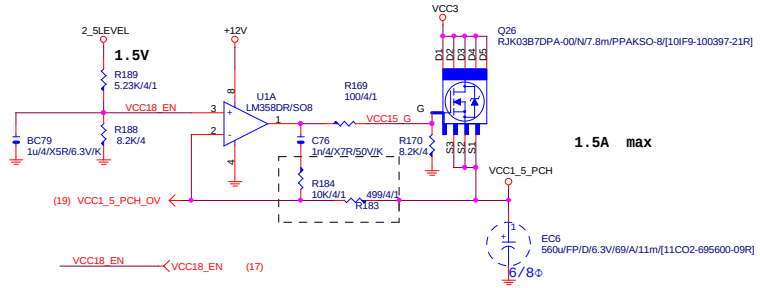
Gigabyte Technology

Title: Realtek RTL8111G

Size: Custom | Document Number: GA-H81M-D2W WG | Rev: 1.01

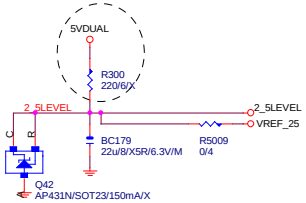
Date: Tuesday, December 31, 2013 | Sheet 24 of 33

VCC1_8_PCH

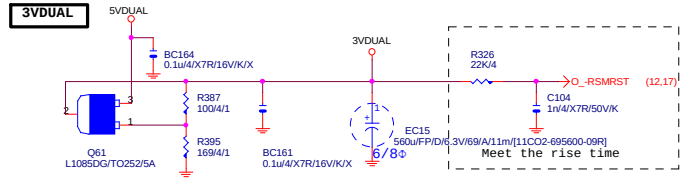


2_5LEVEL

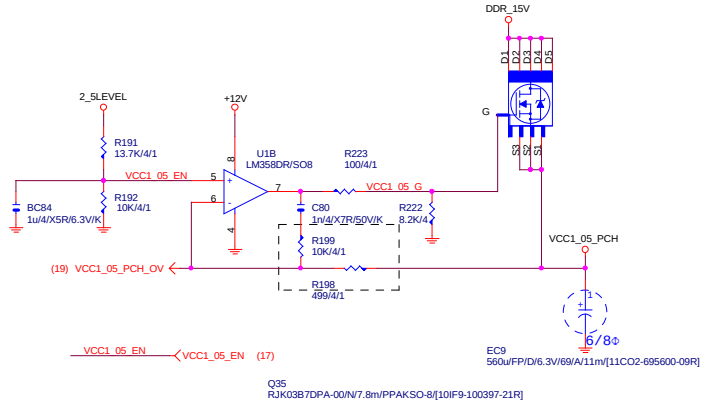
ERP

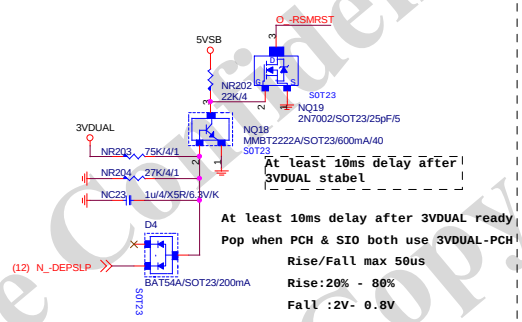


3VDUAL

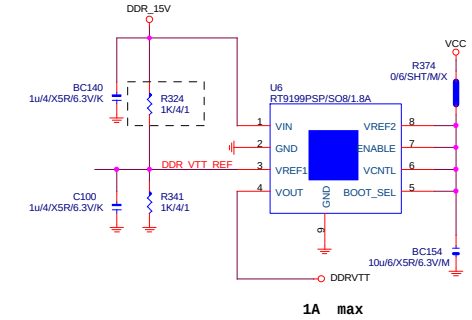


VCC1_05_PCH

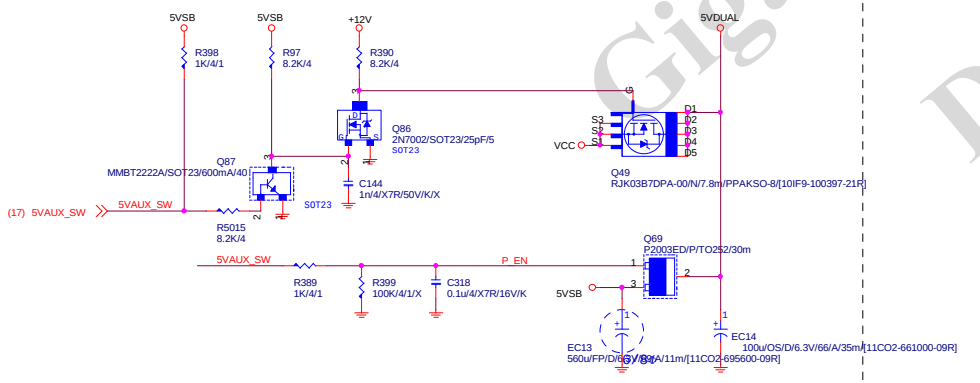




DDRVTT

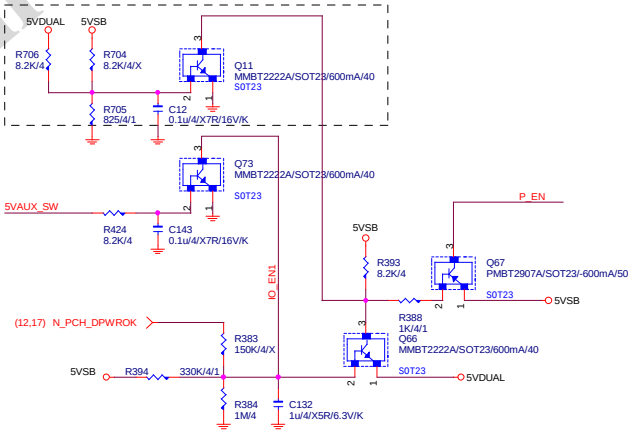


5VDUAL



5VDUAL SHORT PROTECT

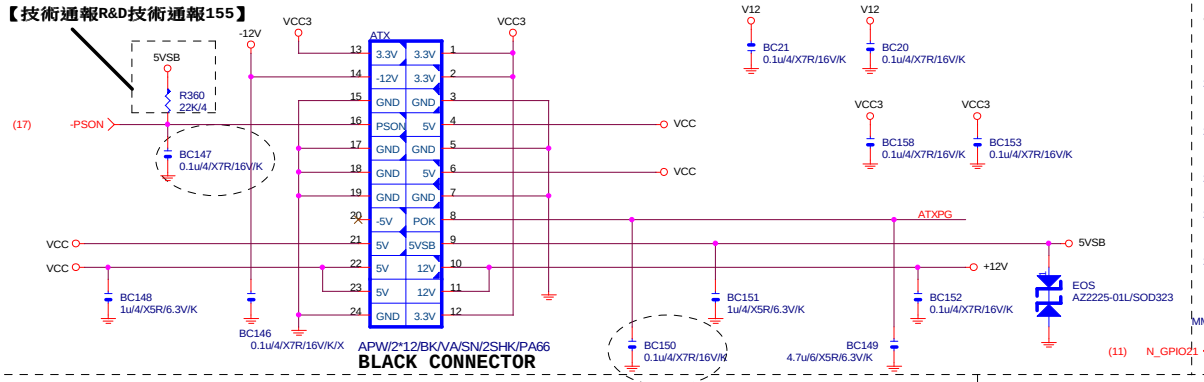
5VSB OVP:7.5V protection



Title	Gigabyte Technology	
	DISCRETE POWER	
Size: Custom	Document Number: GA-H81M-D2W WG	Rev: 1.01
Date: Tuesday, December 31, 2013	Sheet 25 of 33	

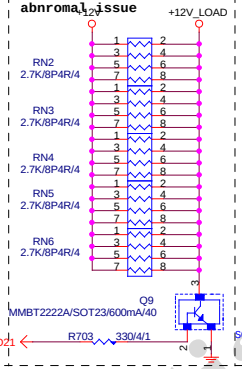
ATXX24 POWER CONNECTOR

【技術通報R&D技術通報155】

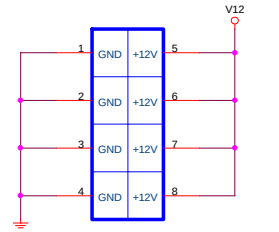


【技術通報R&D技術通報158】

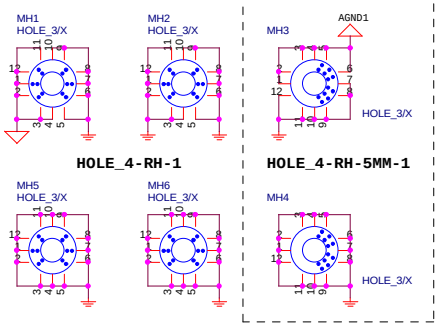
To fix 12V light load abnroma l issue

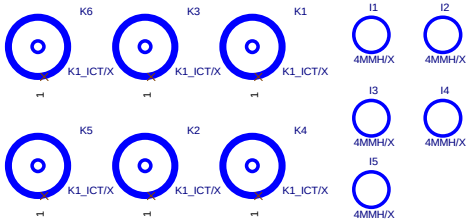


ATXX4 POWER CONNECTOR



TPM

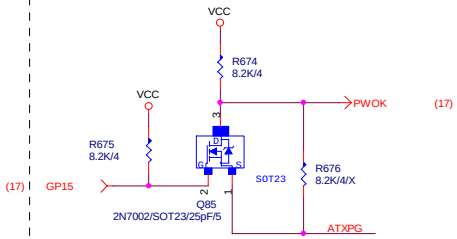


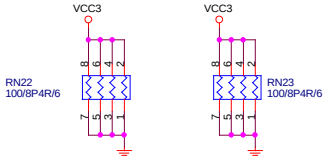


To prevent the 5VSB under loading when boot

PWOK PATCH

【技術通報R&D技術通報154】

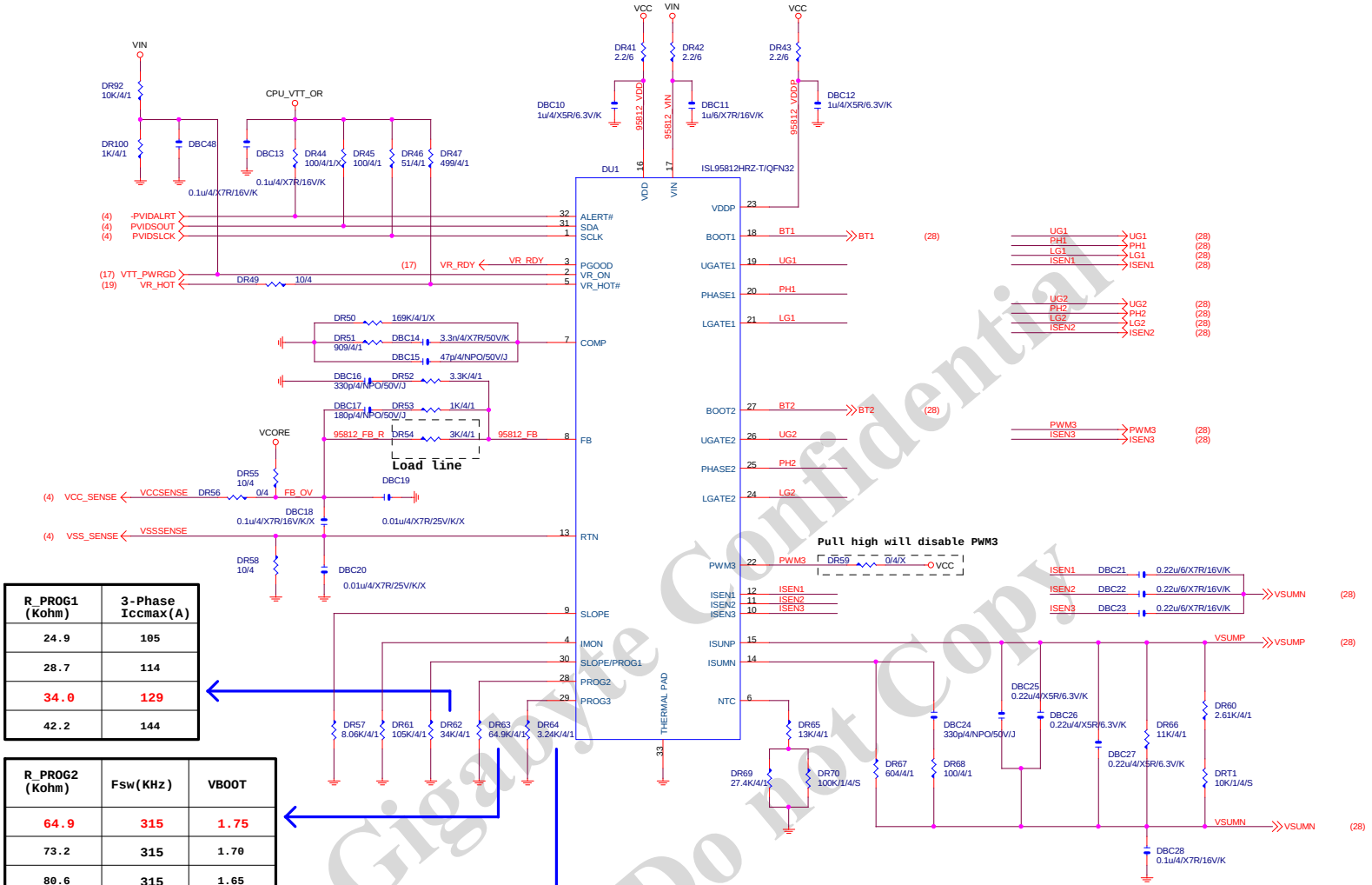




FIX PWR MINMUN LOAD

Gigabyte Technology

Title	ATX CONNECTOR	
Size: Custom	Document Number: GA-H81M-D2W WG	Rev: 1.01
Date: Tuesday, December 31, 2013	Sheet 26 of 33	



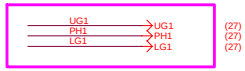
R_PROG1 (Kohm)	3-Phase Iccmax(A)
24.9	105
28.7	114
34.0	129
42.2	144

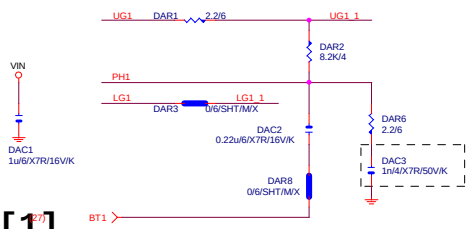
R_PROG2 (Kohm)	Fsw(KHz)	VBOOT
64.9	315	1.75
73.2	315	1.70
80.6	315	1.65
90.9	315	0

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

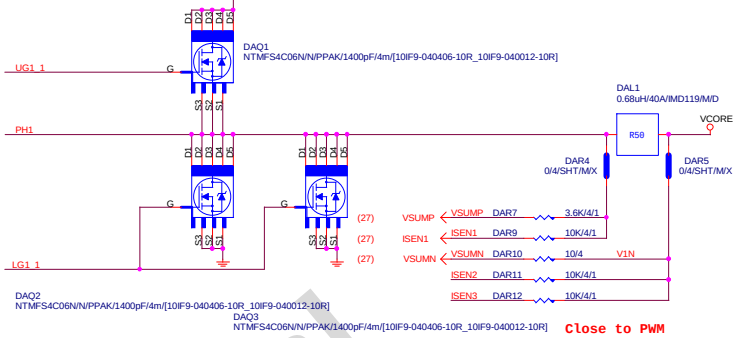
Gigabyte Technology		
Title: CPU CORE VR-1		
Size: Custom	Document Number: GA-H81M-D2W WG	Rev: 1.01
Date: Tuesday, December 31, 2013	Sheet 27 of 33	

PHASE 1



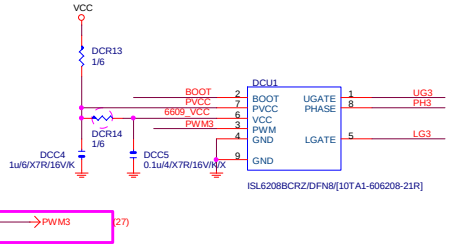


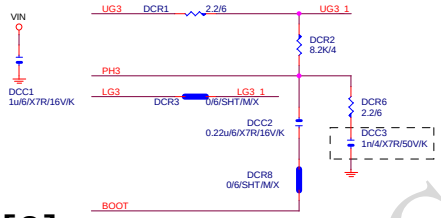
[1]



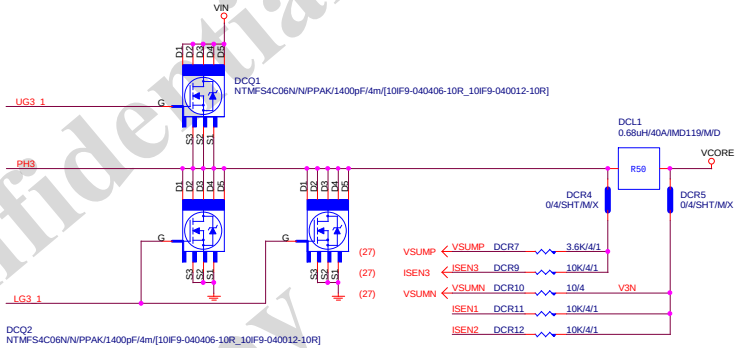
Close to PWM

PHASE 3



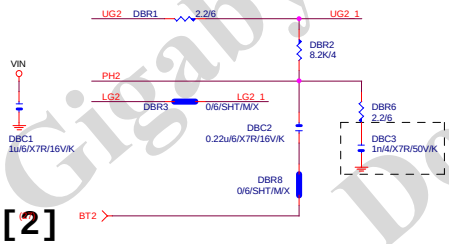


[3]

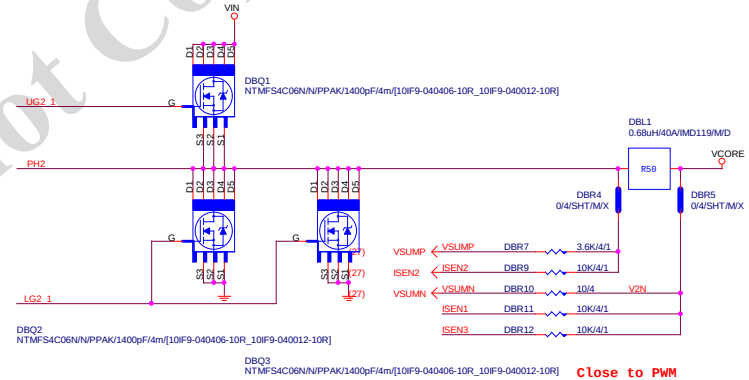


Close to PWM

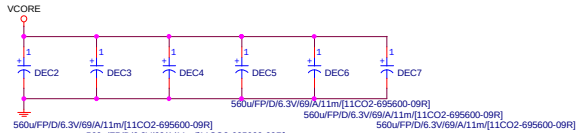
PHASE 2

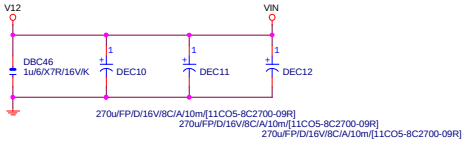


[2]



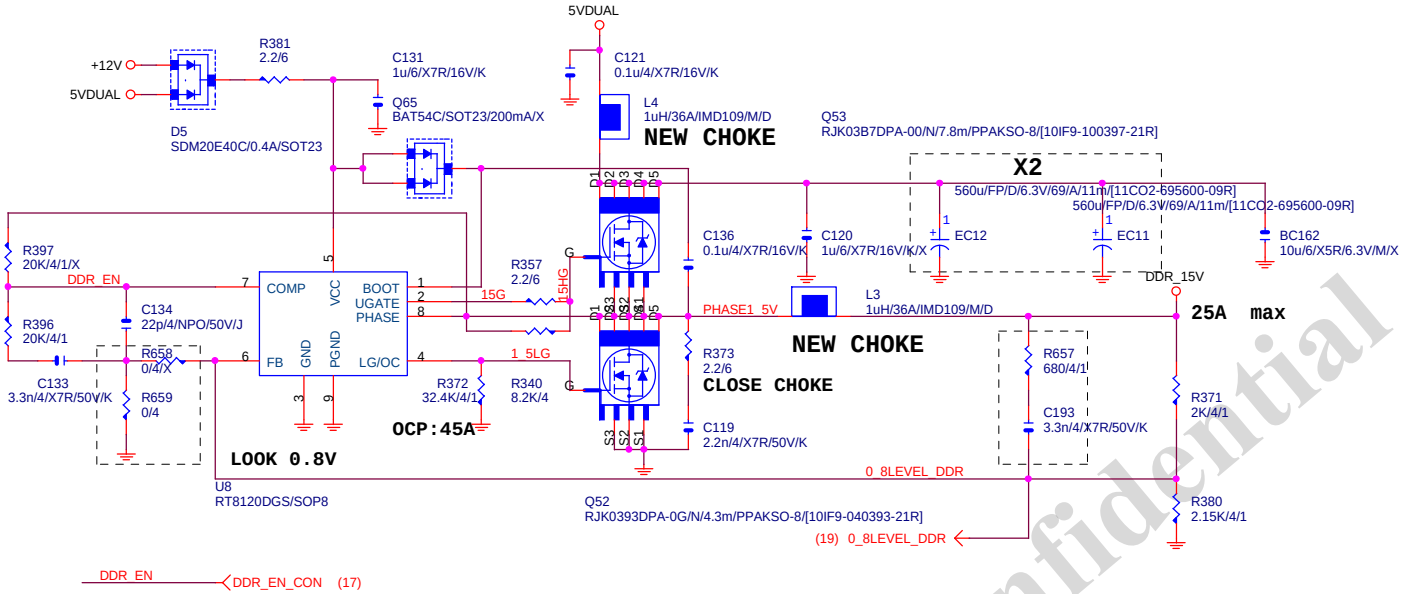
Close to PWM



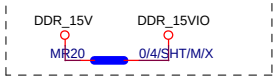


Gigabyte Technology			
Title: CPU CORE VR-2			
Size: Custom	Document Number: GA-H81M-D2W WG		Rev: 1.01
Date: Tuesday, December 31, 2013	Sheet 28 of 33		

DDR15V



From DDR_15V source
10 mils trace to SIO



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

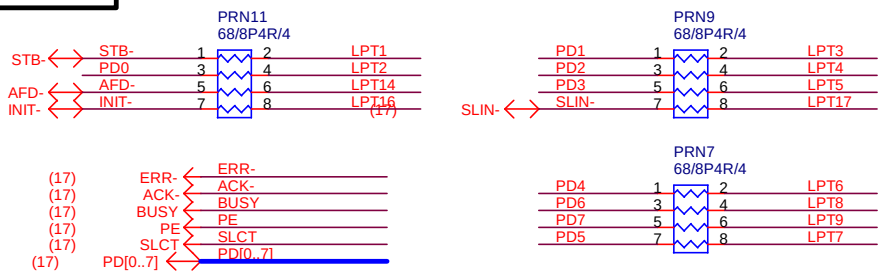
Gigabyte Technology			
Title: DDR POWER			
Size: Custom	Document Number: GA-H81M-D2W WG		Rev: 1.01
Date: Tuesday, December 31, 2013	Sheet 29 of 33		

VCC1_05_ME

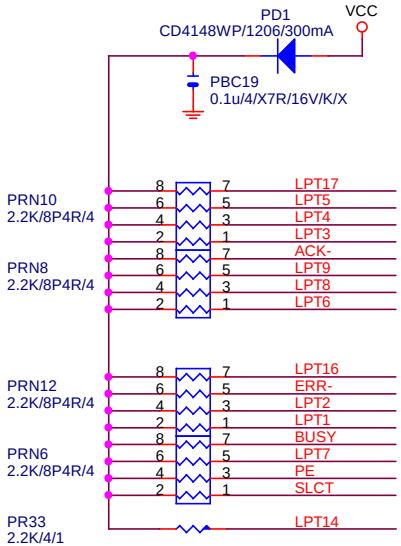
【技術通報R&D技術通報156】
(RICHTEK), (NUVOTON), (EMC)做共用
PIN7分壓阻值須做修改為100K以上電阻值

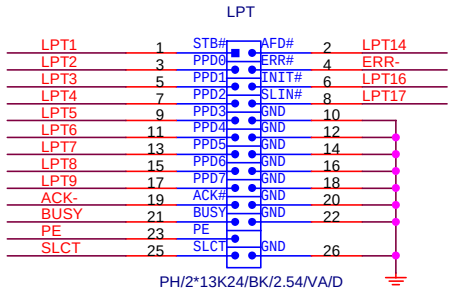
VCC3_ME

LPT PORT

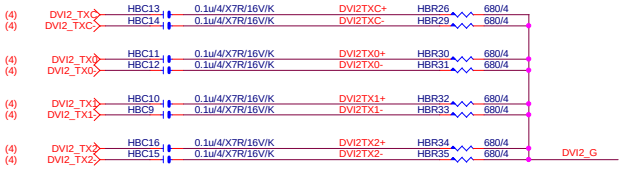


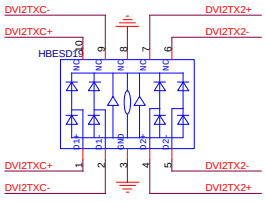
【技術通報R&D技術通報151】
33ohm Change to 68ohm





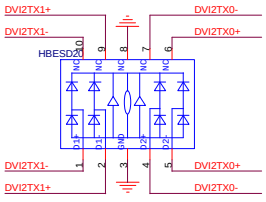
Gigabyte Technology			
Title: LPT			
Size: Custom	Document Number: GA-H81M-D2W WG		Rev: 1.01
Date: Tuesday, December 31, 2013	Sheet 30 of 33		





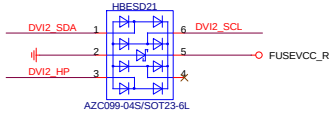
AZ1045-04F/MSOP10

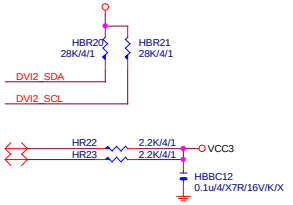
Close to connector

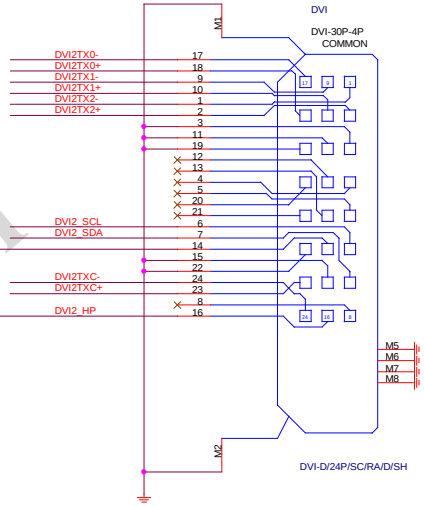


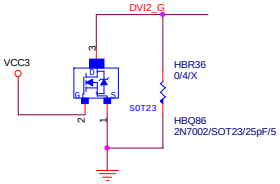
AZ1045-04F/MSOP10

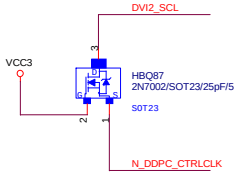
Close to connector

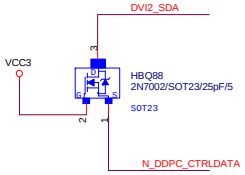


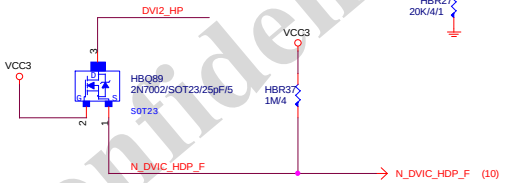


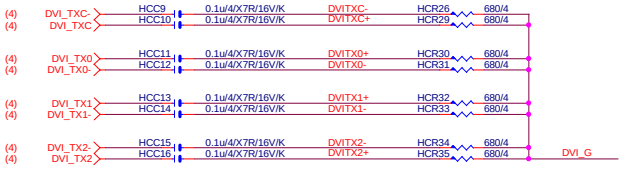


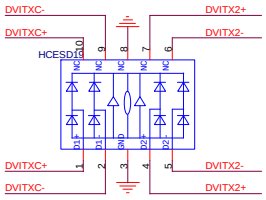






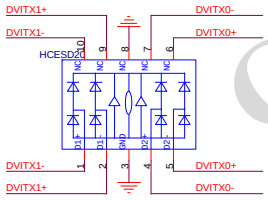






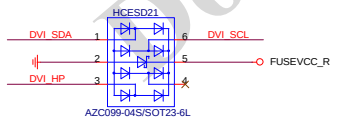
AZ1045-04F/MSOP10

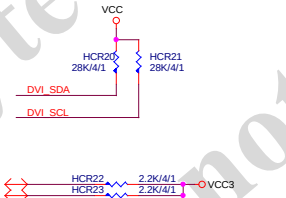
Close to connector

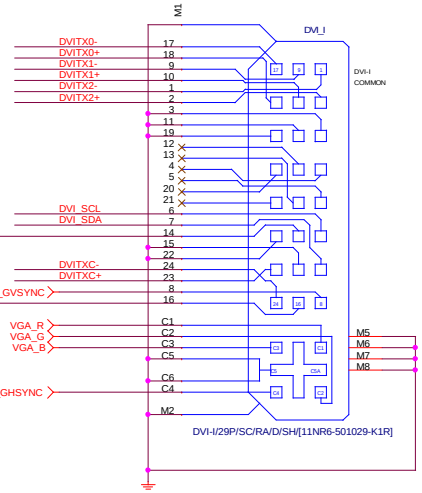


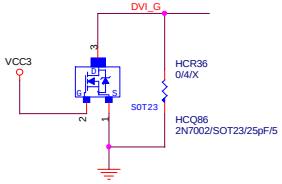
AZ1045-04F/MSOP10

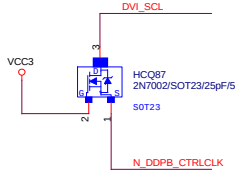
Close to connector

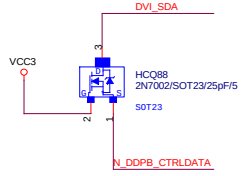


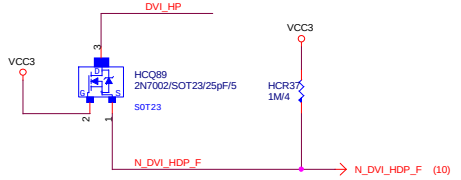






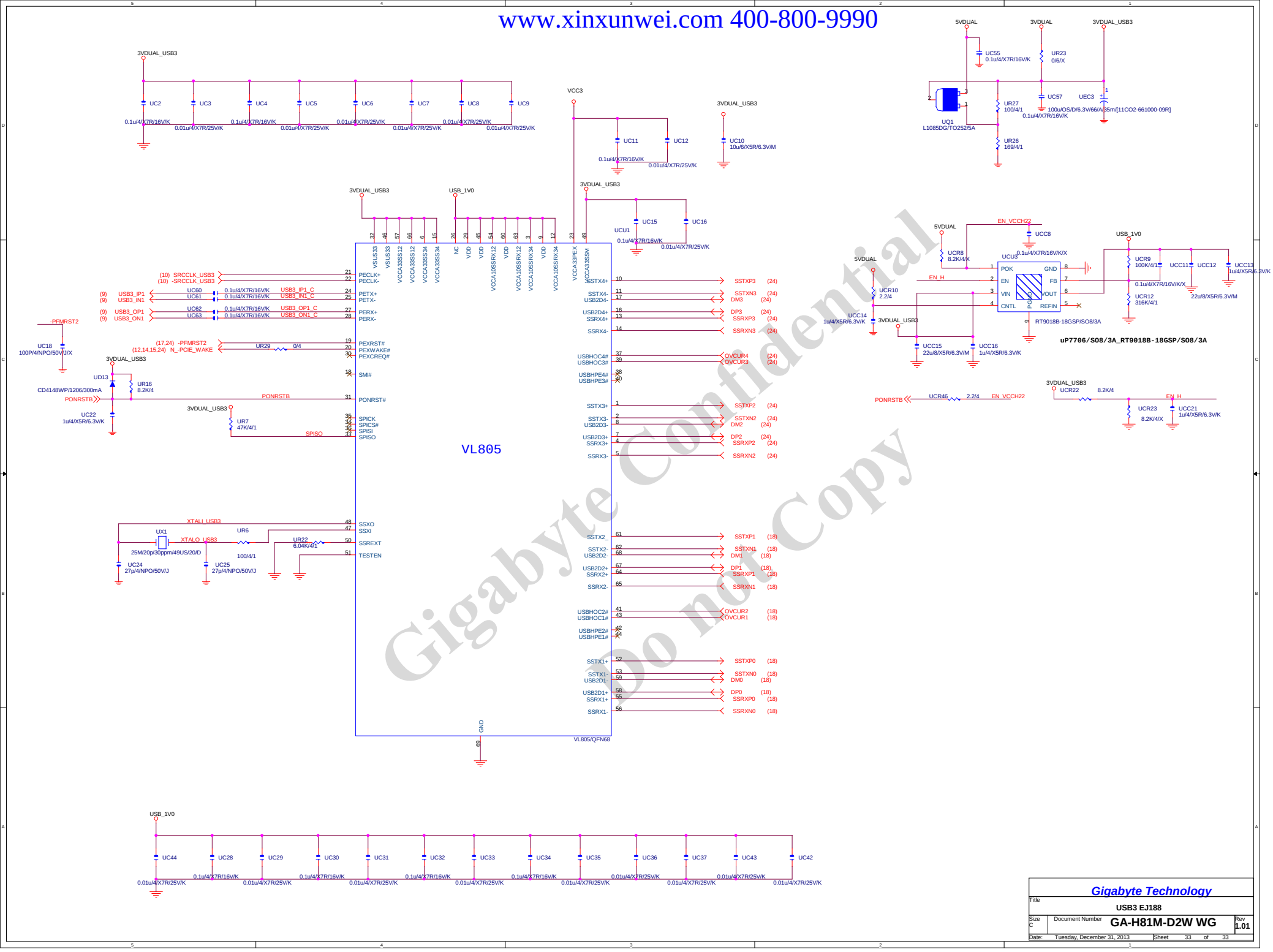






Gigabyte Technology		
Title: DVI		
Size: Custom	Document Number: GA-H81M-D2W WG	Rev: 1.01
Date: Tuesday, December 31, 2013	Sheet 31 of 33	

Gigabyte Technology			
Title: ITE IT8892E			
Size: Custom	Document Number: GA-H81M-D2W WG		Rev: 1.01
Date: Tuesday, December 31, 2013		Sheet 32 of 33	



Gigabyte Technology			
Title: USB3 EJ188			
Size: C	Document Number: GA-H81M-D2W WG		Rev: 1.01
Date: Tuesday, December 31, 2013	Sheet 33 of 33		