Model Name: GA-H81M-HD3

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 X16 SLOT
15	PCI EXPRESS X1 SLOT
16	PCI SLOT 1,2
17	ITE 8620 LPC IO
18	COM,LPT,KB_MS
19	HWM,FAN CTRL,OV,-PROCHOT
20	DUAL BIOS
21	R_USB30,FP,FUSB,SPK,SATALED
22	CODEC ALC892
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	DVI
31	ITE IT8892E
32	USB3 VL805
33	HDMI/DP
34	F_USB30

Gigabyte Technology

Title: Cover Sheet

Size: Custom | Document Number: GA-H81M-HD3 | Rev: 1.01

Date: Friday, September 13, 2013 | Sheet 1 of 33

Model Name: GA-H81M-HD3

Revision 1.01

Component value change history

2013/04/22

Data	Change Item	Reason
2013.05.26	8 Series 78 , 79	
2013.06.13	Add HBC11 0.1uF	
2013.06.14	移除 OL_1 ，上ORN1	
2013.06.21	上EC1	
2013.06.25	Add R715	
	移除 R383 不上，R384改1M	
	R389 改1K	
2013.07.01	移除 OR25	
2013.07.10	移除 CD1	
	Add R706 R705 C10 Q10	

Circuit or PCB layout change

DATE	Change Item	Reason
2013.06.13	移除 SYS_FAN2	
Rev 1.0		
2013.06.20	Add USB 保護線路	
2013.06.25	移除 FAN_+12V_L，改成 +12V	
2013.07.01	增加POWER CORE不過電線路	
2013.07.01	增加POWER CORE不過電線路	
2013.07.08	修改DVI Connect 端 layout differential	

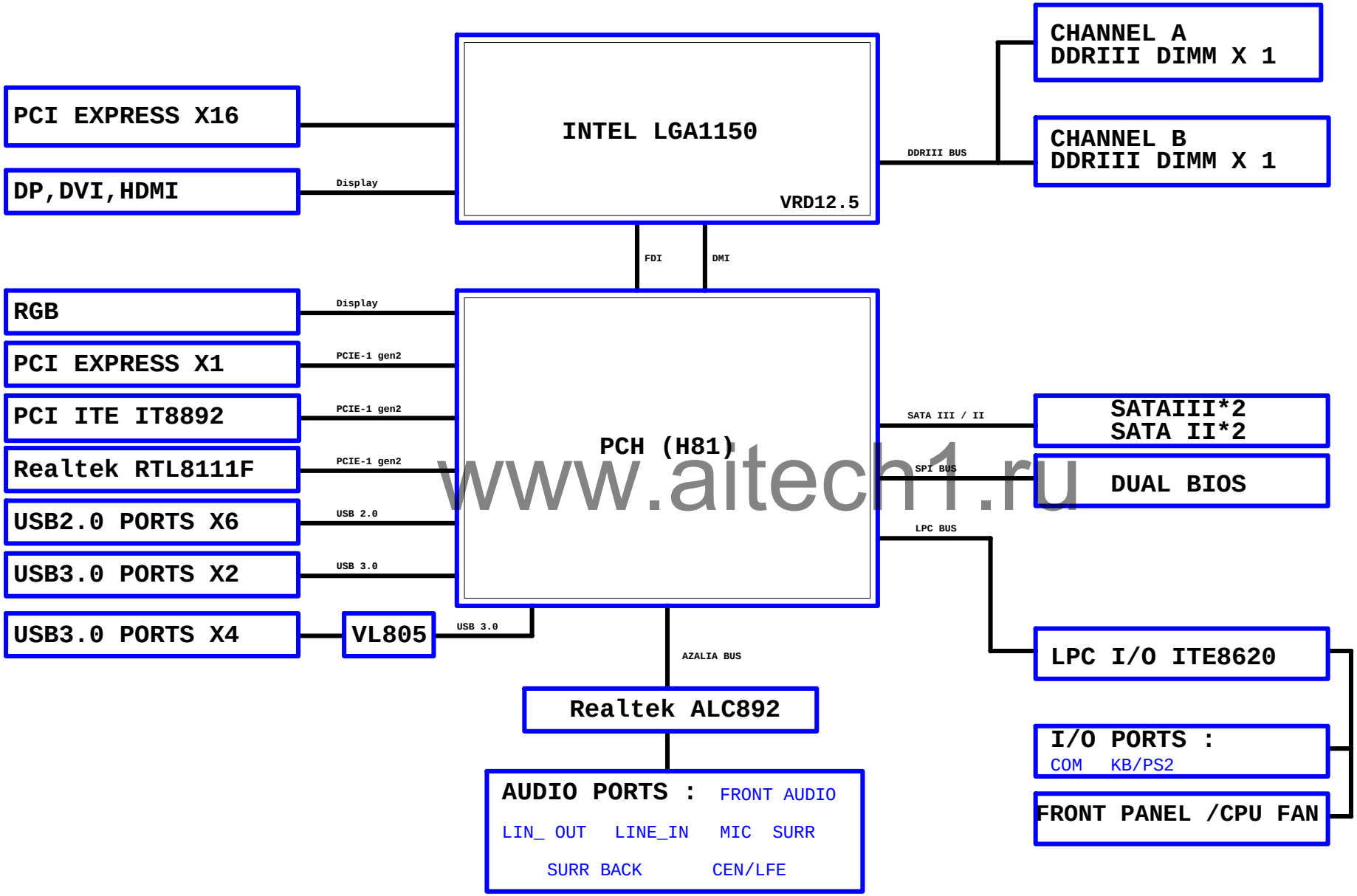
Gigabyte Technology

Title: BOM & PCB MODIFY HISTORY

Size: Custom | Document Number: GA-H81M-HD3 | Rev: 1.01

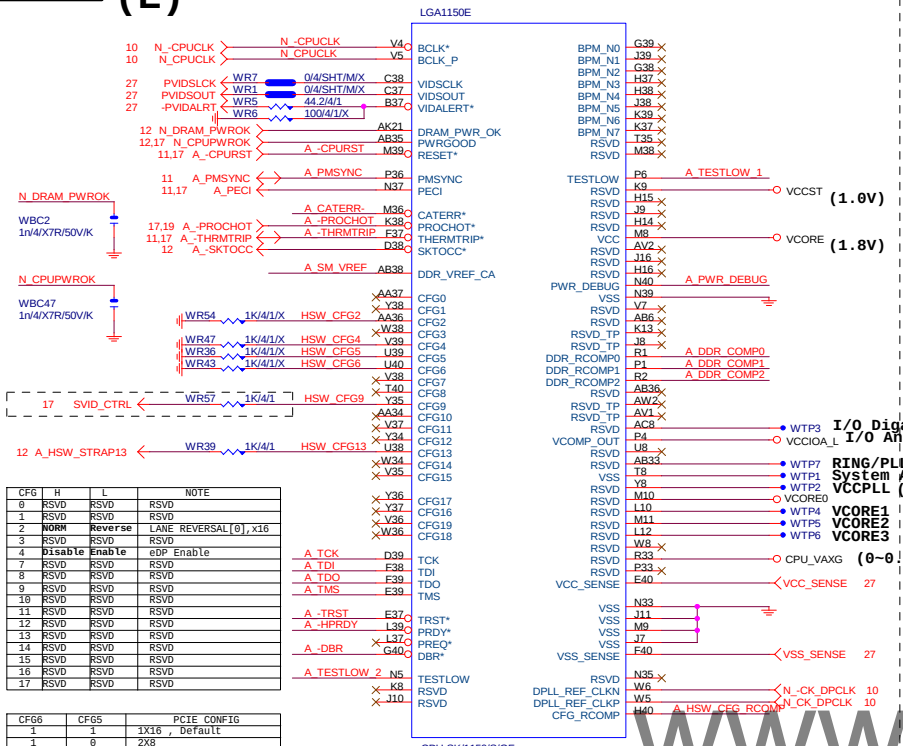
Date: Friday, September 13, 2013 | Sheet 2 of 33

BLOCK DIAGRAM



Gigabyte Technology		
Title: BLOCK DIAGRAM		
Size: C	Document Number: GA-H81M-HD3	Rev: 1.01
Date: Friday, September 13, 2013	Sheet 3 of 33	

LGA1150 (E)

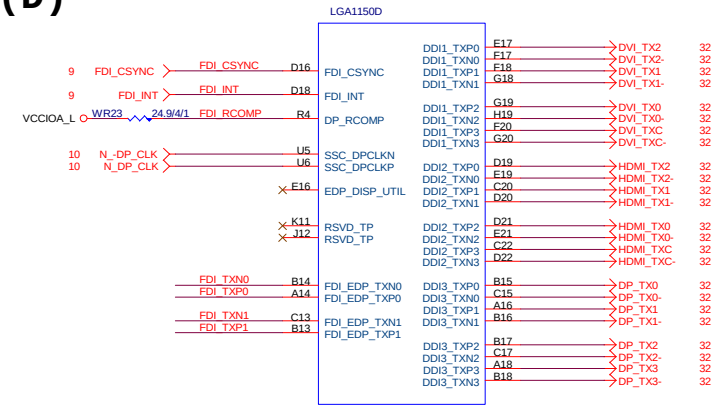


CFG	H	L	NOTE
0	RSVD	RSVD	RSVD
1	RSVD	RSVD	RSVD
2	**NORM**	**Reverse**	LANE REVERSAL[0],x16
3	RSVD	RSVD	RSVD
4	**Disable**	**Enable**	eDP Enable
7	RSVD	RSVD	RSVD
8	RSVD	RSVD	RSVD
9	RSVD	RSVD	RSVD
10	RSVD	RSVD	RSVD
11	RSVD	RSVD	RSVD
12	RSVD	RSVD	RSVD
13	RSVD	RSVD	RSVD
14	RSVD	RSVD	RSVD
15	RSVD	RSVD	RSVD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

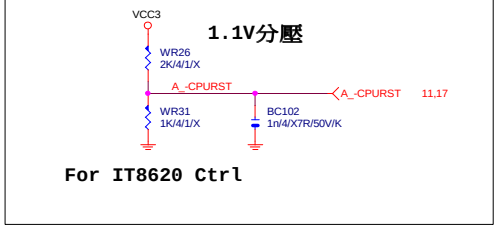
LGA1155 (C)

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

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

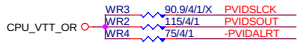
PA_EXP_TXP[0..15] 14
PA_EXP_TXN[0..15] 14
PA_EXP_RXP[0..15] 14
PA_EXP_RXN[0..15] 14

-CPURST

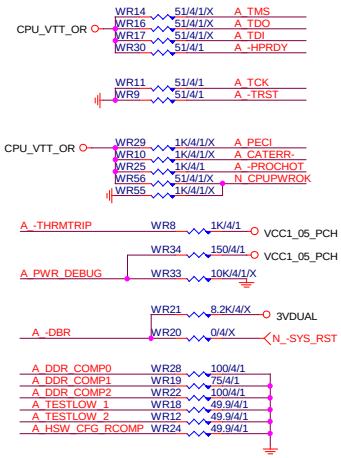


For IT8620 Ctrl

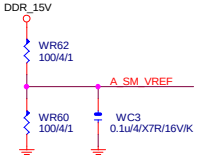
CPU SVID



CPU PU/PD



SM REF



Title	CPU LGA1150-A
Size	Custom
Document Number	GA-H81M-HD3
Rev	1.01
Date:	Friday, September 13, 2013
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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	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
7 SBAA0	SBAA0	AV12	DDR0_BA0	DDR0_DQ32	AY6	MDA33
7 SBAA1	SBAA1	AY11	DDR0_BA1	DDR0_DQ33	AU6	MDA37
7 SBAA2	SBAA2	AT21	DDR0_BA2	DDR0_DQ34	AV4	MDA34
				DDR0_DQ35	AU4	MDA35
7 CKEA0	CKEA0	AV22	DDR0_CKE0	DDR0_DQ36	AW6	MDA36
7 CKEA1	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
7 -CSA0	-CSA0	AU14	DDR0_CS_N0	DDR0_DQ41	AR4	MDA45
7 -CSA1	-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
7 DCLKA0	DCLKA0	AY15	DDR0_CLK_P0	DDR0_DQ46	AN2	MDA46
7 -DCLKA0	-DCLKA0	AY16	DDR0_CLK_N0	DDR0_DQ47	AN1	MDA47
7 DCLKA1	DCLKA1	AW15	DDR0_CLK_P1	AL1	MDA49
7 -DCLKA1	-DCLKA1	AV15	DDR0_CLK_N1	AL4	MDA53
		AY14	DDR0_CLK_P2	AJ3	MDA50
		AW14	DDR0_CLK_N2	AJ4	MDA51
		AW13	DDR0_CLK_P3	AL2	MDA52
		AY13	DDR0_CLK_N3	AL3	MDA48
				DDR0_DQ52	AJ2	MDA54
		AW12	RSVD	DDR0_DQ53	AJ1	MDA55
				DDR0_DQ54	AG1	MDA57
				DDR0_DQ55	AG4	MDA61
				DDR0_DQ56	AE3	MDA58
				DDR0_DQ57	AE4	MDA59
				DDR0_DQ58	AG2	MDA60
				DDR0_DQ59	AG3	MDA56
				DDR0_DQ60	AE2	MDA62
7 -SRASA	-SRASA	AU12	DDR0_RAS*	DDR0_DQ61	AE1	MDA63
7 -SWEA	-SWEA	AU11	DDR0_WE*	DDR0_DQ62	AE39	DQSA0
		AV20	RSVD	DDR0_DQ63	AJ39	DQSA1
		AW27	RSVD	DDR0_DQS_P0	AN39	DQSA2
				DDR0_DQS_P1	AV36	DQSA3
7 -SCASA	-SCASA	AU9	DDR0_CAS*	DDR0_DQS_P2	AV5	DQSA4
				DDR0_DQS_P3	AP3	DQSA5
				DDR0_DQS_P4	AK3	DQSA6
				DDR0_DQS_P5	AE3	DQSA7
				DDR0_DQS_P6	AV32	
7,8 -DDR3_RST	WR61 0/4/SHT/M/X	AK22	DDR_RESET*	DDR0_DQS_P7	AE38	-DQSA0
				DDR0_DQS_P8	AJ38	-DQSA1
				DDR0_DQS_N0	AN38	-DQSA2
				DDR0_DQS_N1	AU36	-DQSA3
				DDR0_DQS_N2	AW5	-DQSA4
				DDR0_DQS_N3	AP2	-DQSA5
				DDR0_DQS_N4	AK2	-DQSA6
				DDR0_DQS_N5	AF2	-DQSA7
				DDR0_DQS_N6	AU32	
				DDR0_DQS_N7		
				DDR0_DQS_N8		

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

CPU-SK/1150/S/GF

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
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
8 DCLKB0	DCLKB0	AM20	DDR1_CLK_P0	DDR1_DQ47	AP7	MDB42
8 DCLKB0	DCLKB0	AM21	DDR1_CLK_N0	DDR1_DQ48	AM9	MDB52
8 DCLKB1	DCLKB1	AP22	DDR1_CLK_P1	DDR1_DQ49	AL9	MDB53
8 DCLKB1	DCLKB1	AP21	DDR1_CLK_N1	DDR1_DQ50	AL6	MDB50
				DDR1_DQ51	AL7	MDB55
		AN20	DDR1_CLK_P2	DDR1_DQ52	AM10	MDB48
		AN21	DDR1_CLK_N2	DDR1_DQ53	AL10	MDB49
		AP19	DDR1_CLK_P3	DDR1_DQ54	AM6	MDB54
		AP20	DDR1_CLK_N3	DDR1_DQ55	AM7	MDB51
				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

CPU-SK/1150/S/GF

LGA1150 (CR)

CR
CPU RETAINTION/X

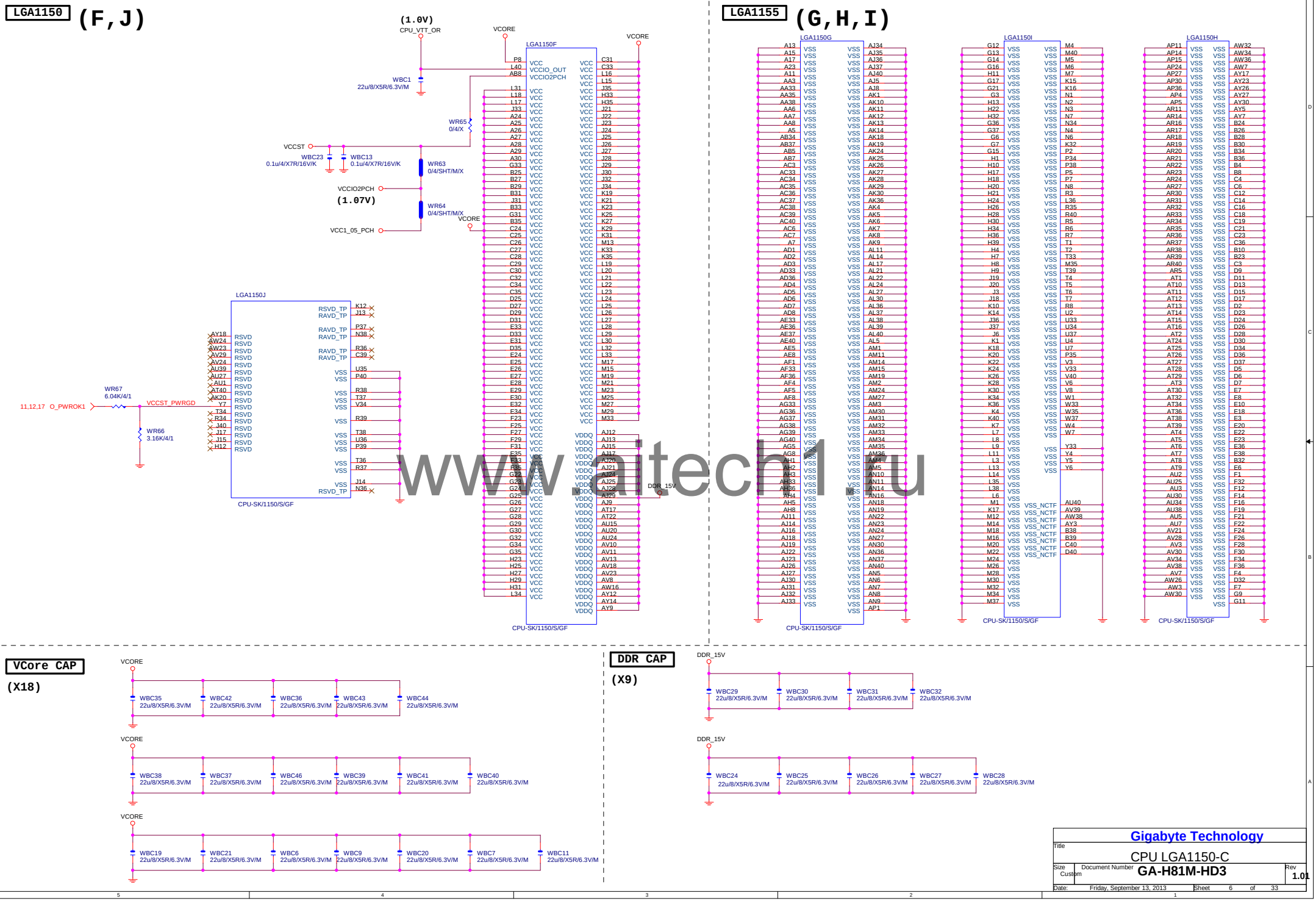
LGA1150

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-HD3		Rev: 1.01
Date: Friday, September 13, 2013		Sheet 5 of 33	

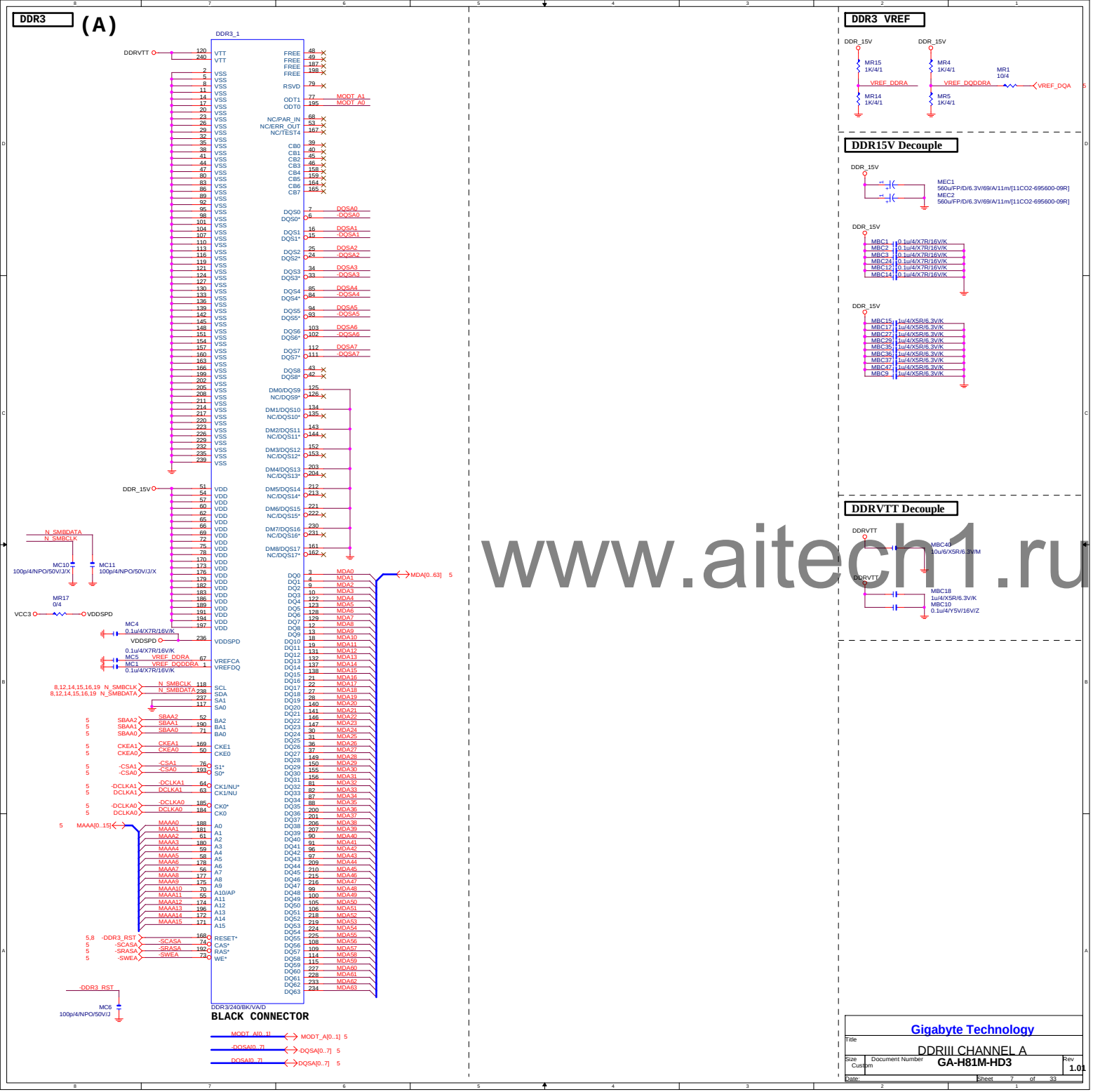


Gigabyte Technology

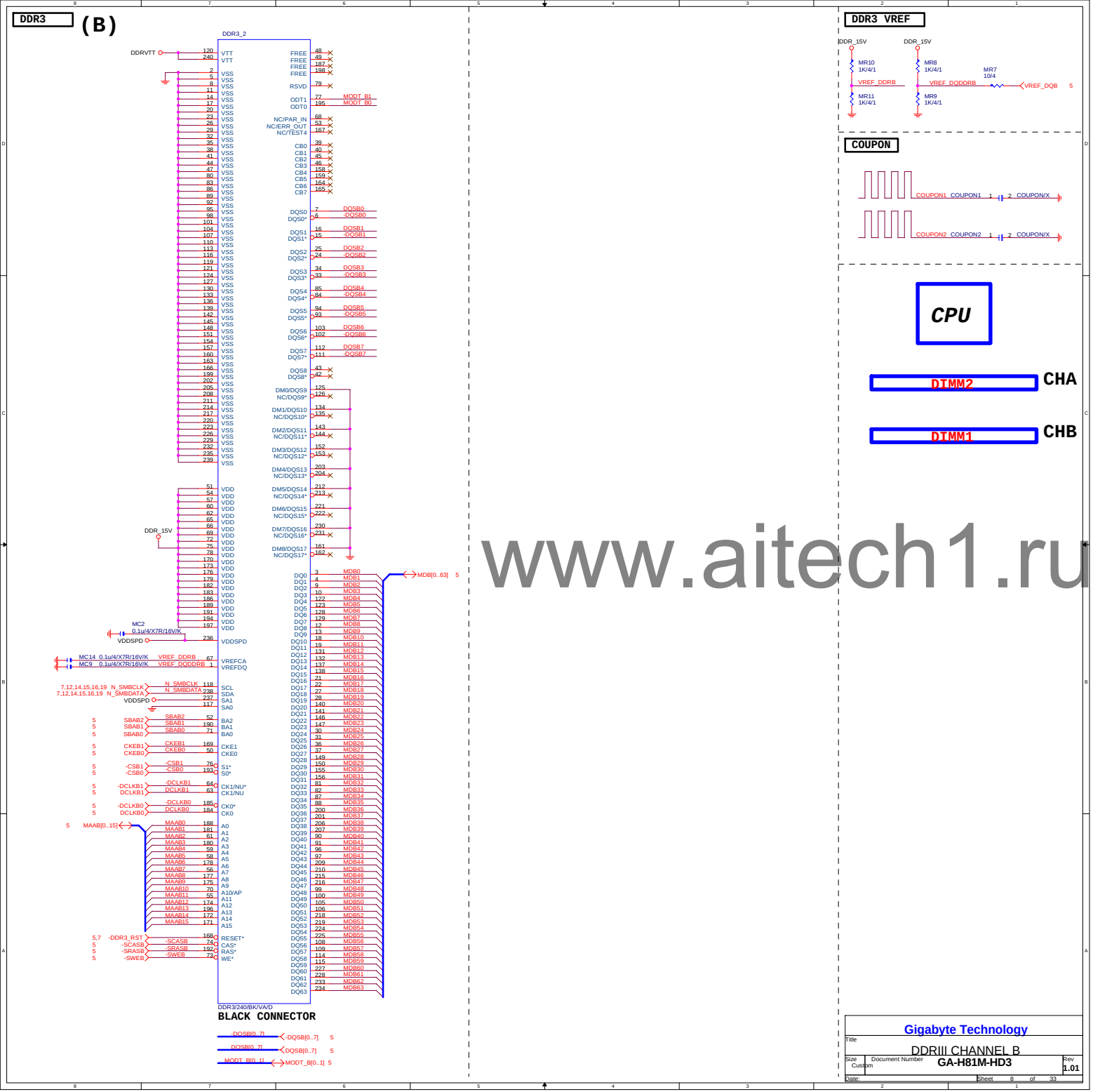
Title: CPU LGA1150-C

Size: Custom | Document Number: GA-H81M-HD3 | Rev: 1.01

Date: Friday, September 13, 2013 | Sheet 6 of 33



Gigabyte Technology			
Title: DDRIII CHANNEL A			
Size: Custom	Document Number: GA-H81M-HD3		Rev: 1.01
Date:	Sheet 7 of 33		



Gigabyte Technology

Title: DDRIII CHANNEL B

Size: Custom | Document Number: GA-H81M-HD3 | 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%

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

A_DMI_0TXN L24 A_DMI_0TXP K24 A_DMI_0RXN C20 A_DMI_0RXP B20 A_DMI_1TXN G24 A_DMI_1TXP H24 A_DMI_1RXN D21 A_DMI_1RXP B21 A_DMI_2TXN F26 A_DMI_2TXP G26 A_DMI_2RXN B22 A_DMI_2RXP C22 A_DMI_3TXN K26 A_DMI_3TXP L26 A_DMI_3RXN A24 A_DMI_3RXP B24

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

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 — USB

AV10 N_-USBP0 — N_-USBP0 33
AU10 N_+USBP0 — N_+USBP0 33
AV11 N_-USBP1 — N_-USBP1 33
AW11 N_+USBP1 — N_+USBP1 33
AN14 N_-USBP2 — N_-USBP2 18
AP14 N_+USBP2 — N_+USBP2 18
AJ16 N_-USBP3 — N_-USBP3 18
AK16 N_+USBP3 — N_+USBP3 18
AU15
AV15
AU12
AT12
AV14
AW14
AU17
AT17

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

AW16 N_-USBP8 — N_-USBP8 21
AV16 N_+USBP8 — N_+USBP8 21
AN16 N_-USBP9 — N_-USBP9 21
AP16 N_+USBP9 — N_+USBP9 21
AJ18 N_-USBP10 — N_-USBP10 21
AK18 N_+USBP10 — N_+USBP10 21
AP18 N_-USBP11 — N_-USBP11 21
AN18 N_+USBP11 — N_+USBP11 21
AW18
AV18
AP20
AN20

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

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

L14 K14 B12 B11 F14 G14 D11 C11

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 — PCIE

8111F
24 LA_ML_IN F11
24 LA_ML_IP H11
24 LA_ML_ON B9
24 LA_ML_OP A9

8892
30 G_PCIEBIN J11
30 G_PCIEBIP L11
30 G_PCIEBON B8
30 G_PCIEBOP C8

PCIEx1
15 PI_PCIEX1_IN G9
15 PI_PCIEX1_IP F9
15 PI_PCIEX1_ON B7
15 PI_PCIEX1_OP A7

VL805
31 USB3_IN1 F7
31 USB3_IP1 H7
31 USB3_ON1 E1
31 USB3_OP1 D2

N/A

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 — N_-USBOC_F 21,33
AF37
AD39
AD40
AE39 — N_-USBOC_R 18,21
AC41
AE40
AG40 N_GPIO14

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

USBRBIASB USBRBIAS

AV20 N_USBRBIAS — NR47 22.6/4/1
AU20

CLKIN_DOT96N CLKIN_DOT96P

AP11 CK_-DOTCLK
AM11 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)

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

PCH (F)

PCHF

33 PCH_USB3_RXN0 33 PCH_USB3_RXP0 33 PCH_USB3_TXN0 33 PCH_USB3_TXP0
33 PCH_USB3_RXN1 33 PCH_USB3_RXP1 33 PCH_USB3_TXN1 33 PCH_USB3_TXP1

USB3
F20 G20 B18 C18 G18 H18 B15 B16

USB3_RXN_0 USB3_RXP_0 USB3_TXN_0 USB3_TXP_0 USB3_RXN_1 USB3_RXP_1 USB3_TXN_1 USB3_TXP_1

K20 L20 D15 C15 L18 K18 B14 A14

USB3_RXN_4 USB3_RXP_4 USB3_TXN_4 USB3_TXP_4 USB3_RXN_5 USB3_RXP_5 USB3_TXN_5 USB3_TXP_5

N/A

VCC3 — NR62 8.2K/4 — NR63 8.2K/4

AK28
AT34

TACH6_GP70
TACH7_GP71

FDILINK

FDI_RXN_0 FDI_RXP_0 FDI_RXN_1 FDI_RXP_1 FDI_CSYNC FDI_INT FDI_RCOMP

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

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

FDI_TXP[0..1] — FDI_TXP[0..1] 4
FDI_TXN[0..1] — FDI_TXN[0..1] 4

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

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/[10HB1-030H81-10R]

PCH H/S

LOW COST ICH7 HEATSINK

SB_HEATSIN

1 2

GRAY HS

PCH_HS
PCH_HS/[12SP2-S04208-61R_12SP2-S04208-62R_12SP2-S04208-63R]

USB TABLE

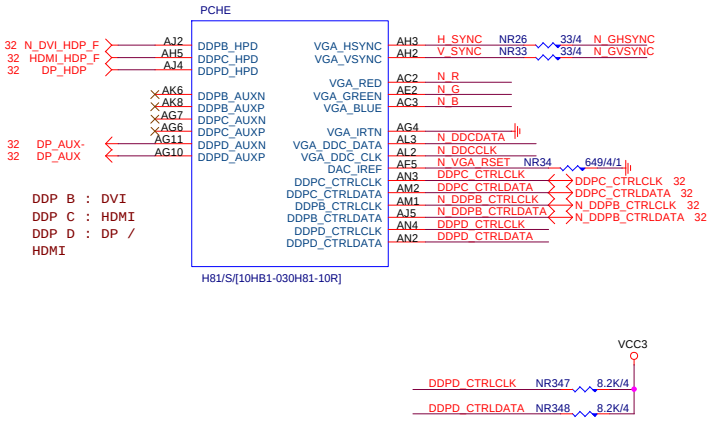
OC[3:0]# for Device 29 (ports 0-7)
OC[7:4]# for Device 26 (ports 8-13)

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

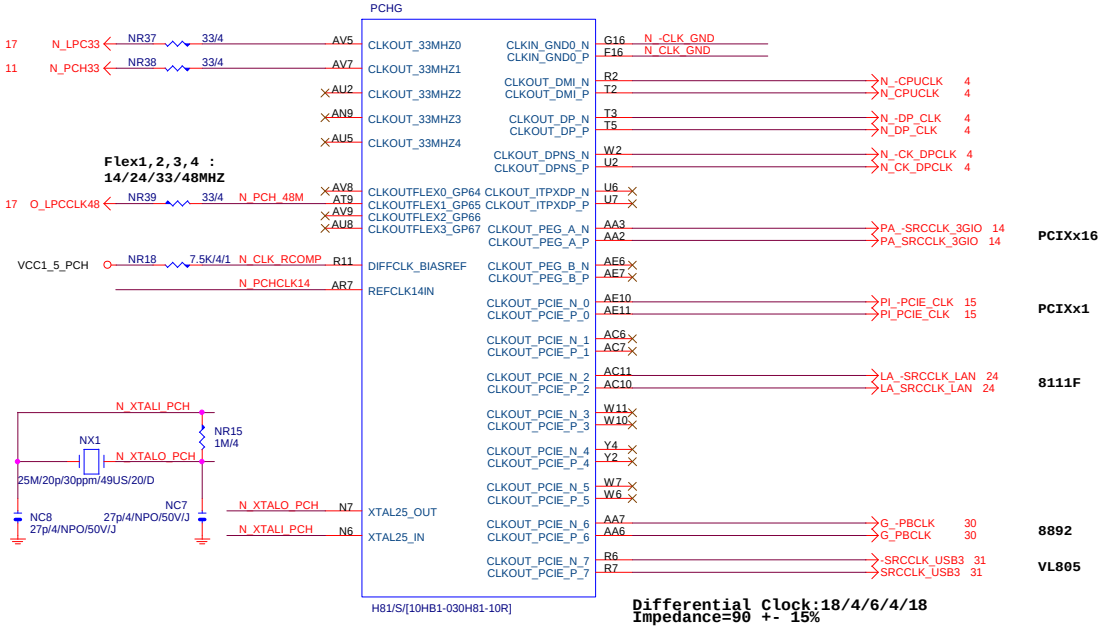
Gigabyte Technology

Title: PCH FDI,DMI,USB ,PCIE,NVRAM
Size: Custom | Document Number: GA-H81M-HD3 | Rev: 1.01
Date: Friday, September 13, 2013 | Sheet 9 of 33

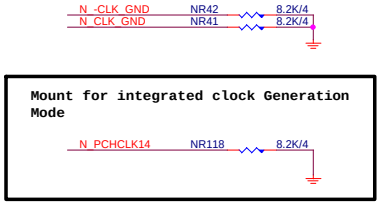
PCH (E)



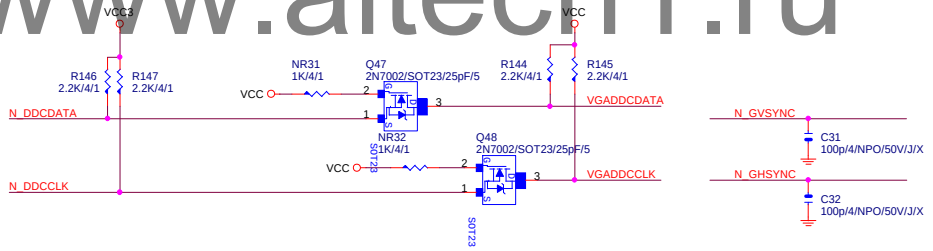
PCH (G)



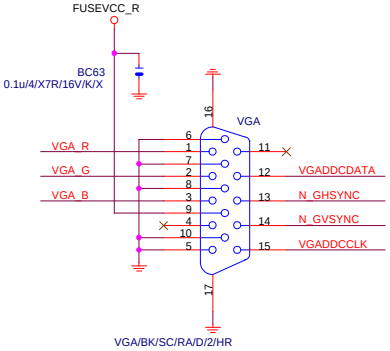
PCH CLK PD



VGA DDC

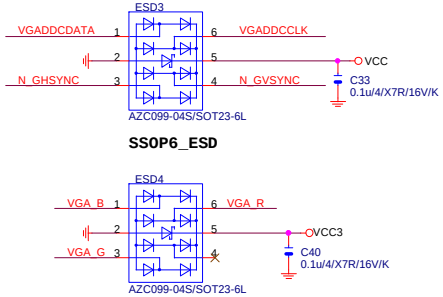


VGA CONNECTOR

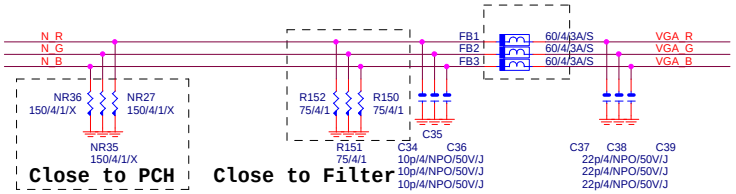


BLACK CONNECTOR

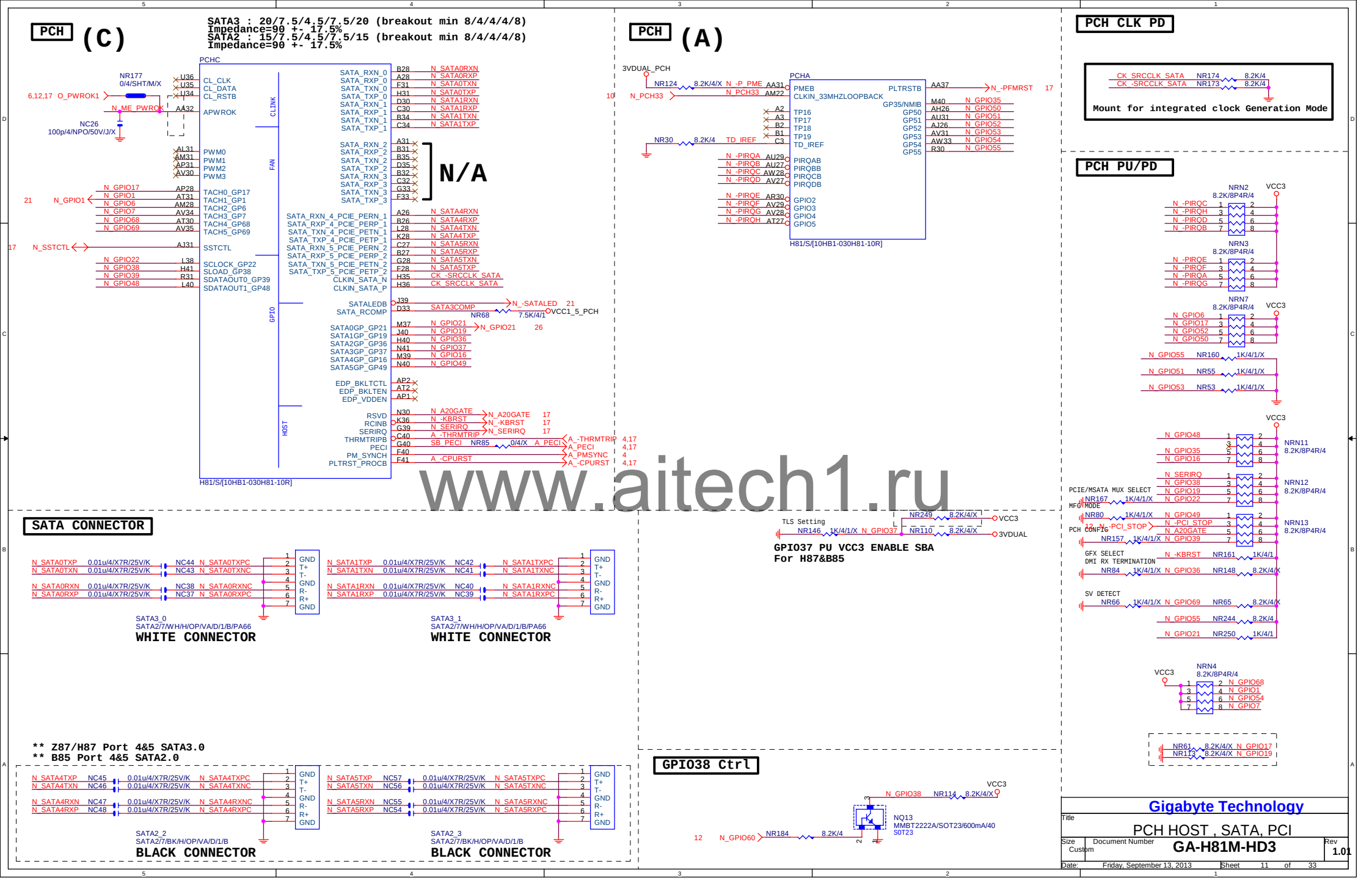
VGA ESD

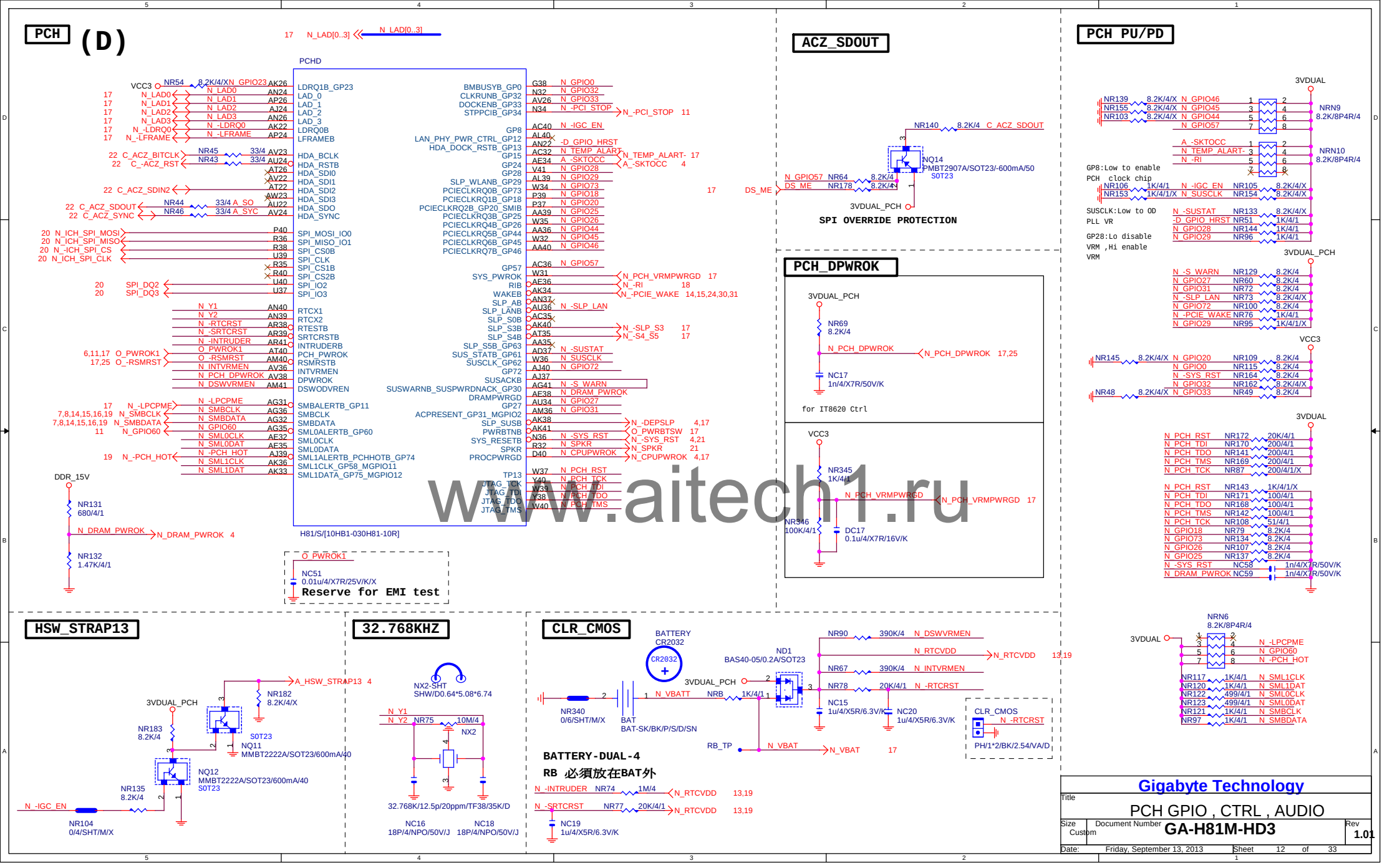


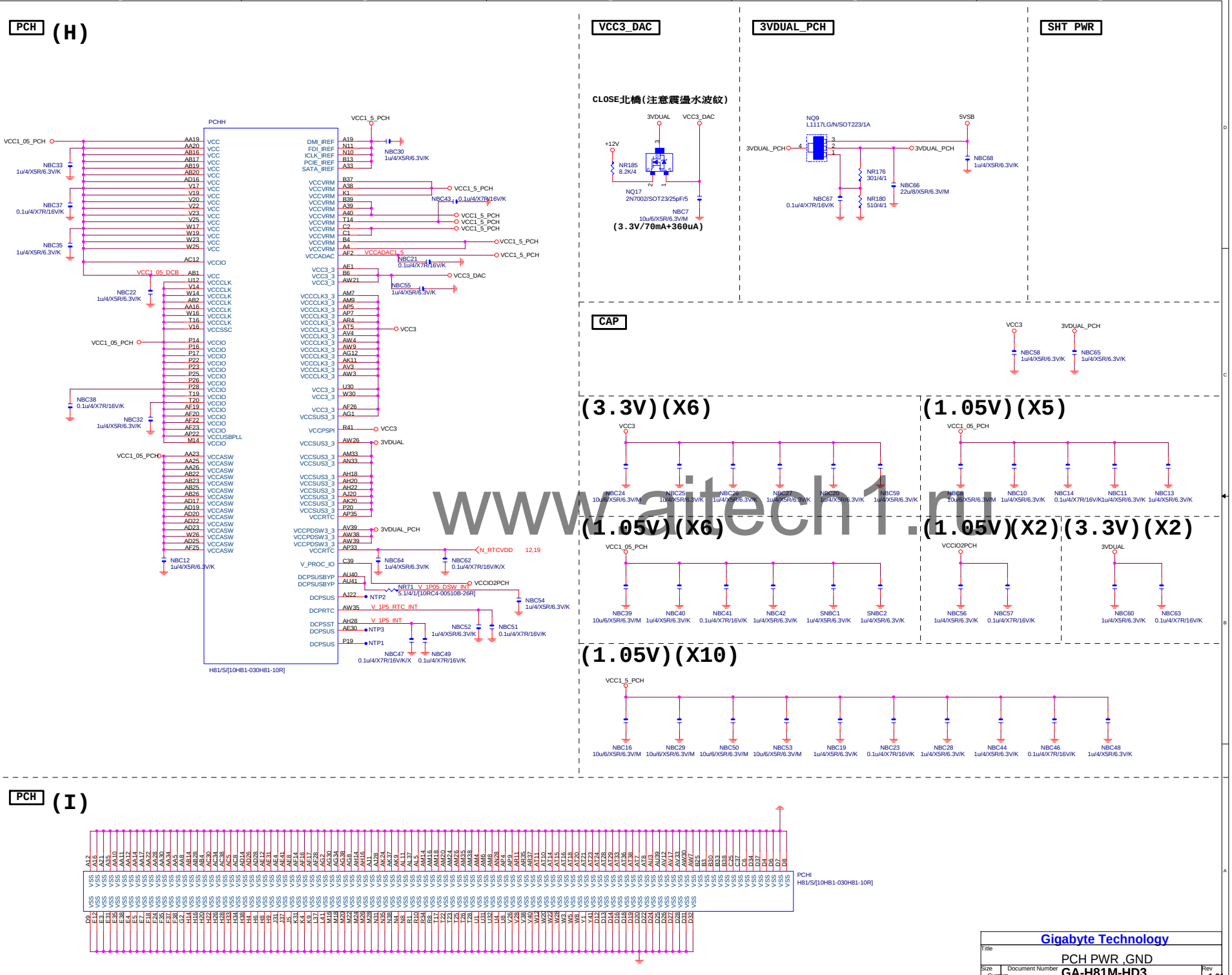
VGA DDC



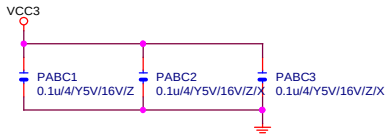
Gigabyte Technology		
Title: PCH DISPLAY ,CLK BUFFER		
Size: Custom	Document Number: GA-H81M-HD3	Rev: 1.01
Date: Friday, September 13, 2013	Sheet 10 of 33	



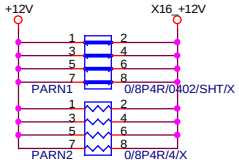




PCIEX16 CAP



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

PCIEX16 SLOT

PCIESLOT-164DN-P

3GIO_*16

PCIEX16

	B1	12V	PRSNT1*	A1	
	B2	12V	12V	A2	
PAR3 0/4/SHT/M/X	B3	RSVD	12V	A3	
SMBCLK	B4	GND	GND	A4	PAR2 0/4/SHT/M/X
SMBDATA	B5	SMCLK	JTAG2	A5	
	B6	SMDAT	JTAG3	A6	
	B7	GND	JTAG4	A7	
	B8	3.3V	JTAG5	A8	
	B9	JTAG1	3.3V	A9	
	B10	3.3VAUX	3.3V	A10	
N_-PCIE_WAKE	B11	WAKE*	PWRGD	A11	-PCIE_RST
		KEY			
	B12	RSVD	GND	A12	
	B13	GND	REFCLK+	A13	PA_SRCCLK_3GIO_10
PA_EXP_TXP0_C	B14	HSOP0	REFCLK-	A14	PA_-SRCCLK_3GIO_10
PA_EXP_TXN0_C	B15	HSON0	GND	A15	
	B16	GND	HSIP0	A16	PA_EXP_RXP0
	B17	PRSNT2*	HSIN0	A17	PA_EXP_RXN0
	B18	GND	GND	A18	
PA_EXP_TXP1_C	B19	HSOP1	RSVD	A19	
PA_EXP_TXN1_C	B20	HSON1	GND	A20	
	B21	GND	HSIP1	A21	PA_EXP_RXP1
	B22	GND	HSIN1	A22	PA_EXP_RXN1
PA_EXP_TXP2_C	B23	HSOP2	GND	A23	
PA_EXP_TXN2_C	B24	HSON2	GND	A24	
	B25	GND	HSIP2	A25	PA_EXP_RXP2
	B26	GND	HSIN2	A26	PA_EXP_RXN2
PA_EXP_TXP3_C	B27	HSOP3	GND	A27	
PA_EXP_TXN3_C	B28	HSON3	GND	A28	
	B29	GND	HSIP3	A29	PA_EXP_RXP3
	B30	RSVD	HSIN3	A30	PA_EXP_RXN3
	B31	PRSNT2*	GND	A31	
	B32	GND	RSVD	A32	
PA_EXP_TXP4_C	B33	HSOP4	RSVD	A33	
PA_EXP_TXN4_C	B34	HSON4	GND	A34	
	B35	GND	HSIP4	A35	PA_EXP_RXP4
	B36	GND	HSIN4	A36	PA_EXP_RXN4
PA_EXP_TXP5_C	B37	HSOP5	GND	A37	
PA_EXP_TXN5_C	B38	HSON5	GND	A38	
	B39	GND	HSIP5	A39	PA_EXP_RXP5
	B40	GND	HSIN5	A40	PA_EXP_RXN5
PA_EXP_TXP6_C	B41	HSOP6	GND	A41	
PA_EXP_TXN6_C	B42	HSON6	GND	A42	
	B43	GND	HSIP6	A43	PA_EXP_RXP6
	B44	GND	HSIN6	A44	PA_EXP_RXN6
PA_EXP_TXP7_C	B45	HSOP7	GND	A45	
PA_EXP_TXN7_C	B46	HSON7	GND	A46	
	B47	GND	HSIP7	A47	PA_EXP_RXP7
	B48	PRSNT2*	HSIN7	A48	PA_EXP_RXN7
	B49	GND	GND	A49	
PA_EXP_TXP8_C	B50	HSOP8	RSVD	A50	
PA_EXP_TXN8_C	B51	HSON8	GND	A51	
	B52	GND	HSIP8	A52	PA_EXP_RXP8
	B53	GND	HSIN8	A53	PA_EXP_RXN8
PA_EXP_TXP9_C	B54	HSOP9	GND	A54	
PA_EXP_TXN9_C	B55	HSON9	GND	A55	
	B56	GND	HSIP9	A56	PA_EXP_RXP9
	B57	GND	HSIN9	A57	PA_EXP_RXN9
PA_EXP_TXP10_C	B58	HSOP10	GND	A58	
PA_EXP_TXN10_C	B59	HSON10	GND	A59	
	B60	GND	HSIP10	A60	PA_EXP_RXP10
	B61	GND	HSIN10	A61	PA_EXP_RXN10
PA_EXP_TXP11_C	B62	HSOP11	GND	A62	
PA_EXP_TXN11_C	B63	HSON11	GND	A63	
	B64	GND	HSIP11	A64	PA_EXP_RXP11
	B65	GND	HSIN11	A65	PA_EXP_RXN11
PA_EXP_TXP12_C	B66	HSOP12	GND	A66	
PA_EXP_TXN12_C	B67	HSON12	GND	A67	
	B68	GND	HSIP12	A68	PA_EXP_RXP12
	B69	GND	HSIN12	A69	PA_EXP_RXN12
PA_EXP_TXP13_C	B70	HSOP13	GND	A70	
PA_EXP_TXN13_C	B71	HSON13	GND	A71	
	B72	GND	HSIP13	A72	PA_EXP_RXP13
	B73	GND	HSIN13	A73	PA_EXP_RXN13
PA_EXP_TXP14_C	B74	HSOP14	GND	A74	
PA_EXP_TXN14_C	B75	HSON14	GND	A75	
	B76	GND	HSIP14	A76	PA_EXP_RXP14
	B77	GND	HSIN14	A77	PA_EXP_RXN14
PA_EXP_TXP15_C	B78	HSOP15	GND	A78	
PA_EXP_TXN15_C	B79	HSON15	GND	A79	
	B80	GND	HSIP15	A80	PA_EXP_RXP15
	B81	PRSNT2*	HSIN15	A81	PA_EXP_RXN15
	B82	RSVD	GND	A82	

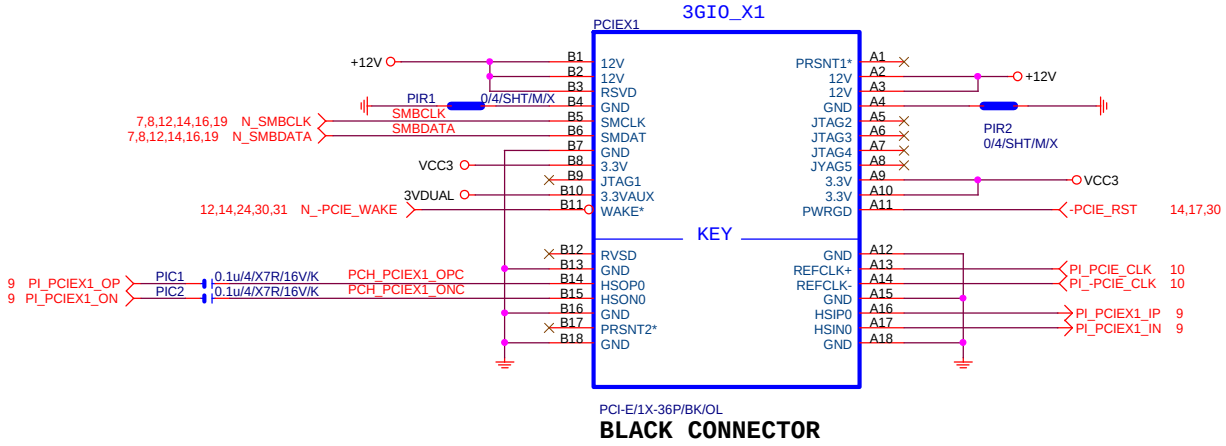
PCI-E/16X-164P/BK/LONG DOUBLE

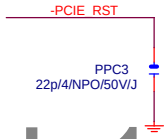
BLACK CONNECTOR

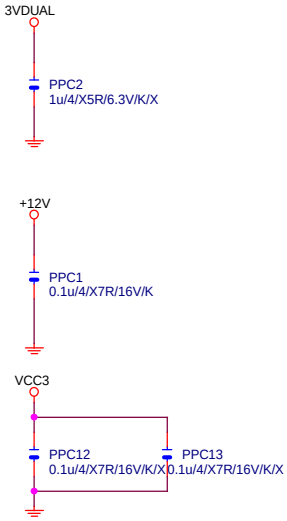
X16_+12V
VCC3
3VDUAL
7,8,12,15,16,19 N_SMBCLK
7,8,12,15,16,19 N_SMBDATA
12,15,24,30,31 N_-PCIE_WAKE
PAR1 0/4/SHT/M/X
PAR2 0/4/SHT/M/X
-PCIE_RST
15,17,30
PAC1 22p/4/NPO/50V/J/X

Gigabyte Technology		
Title: PCI EXPRESS * 16		
Size: Custom	Document Number: GA-H81M-HD3	Rev: 1.01
Date: Friday, September 13, 2013	Sheet 14 of 33	

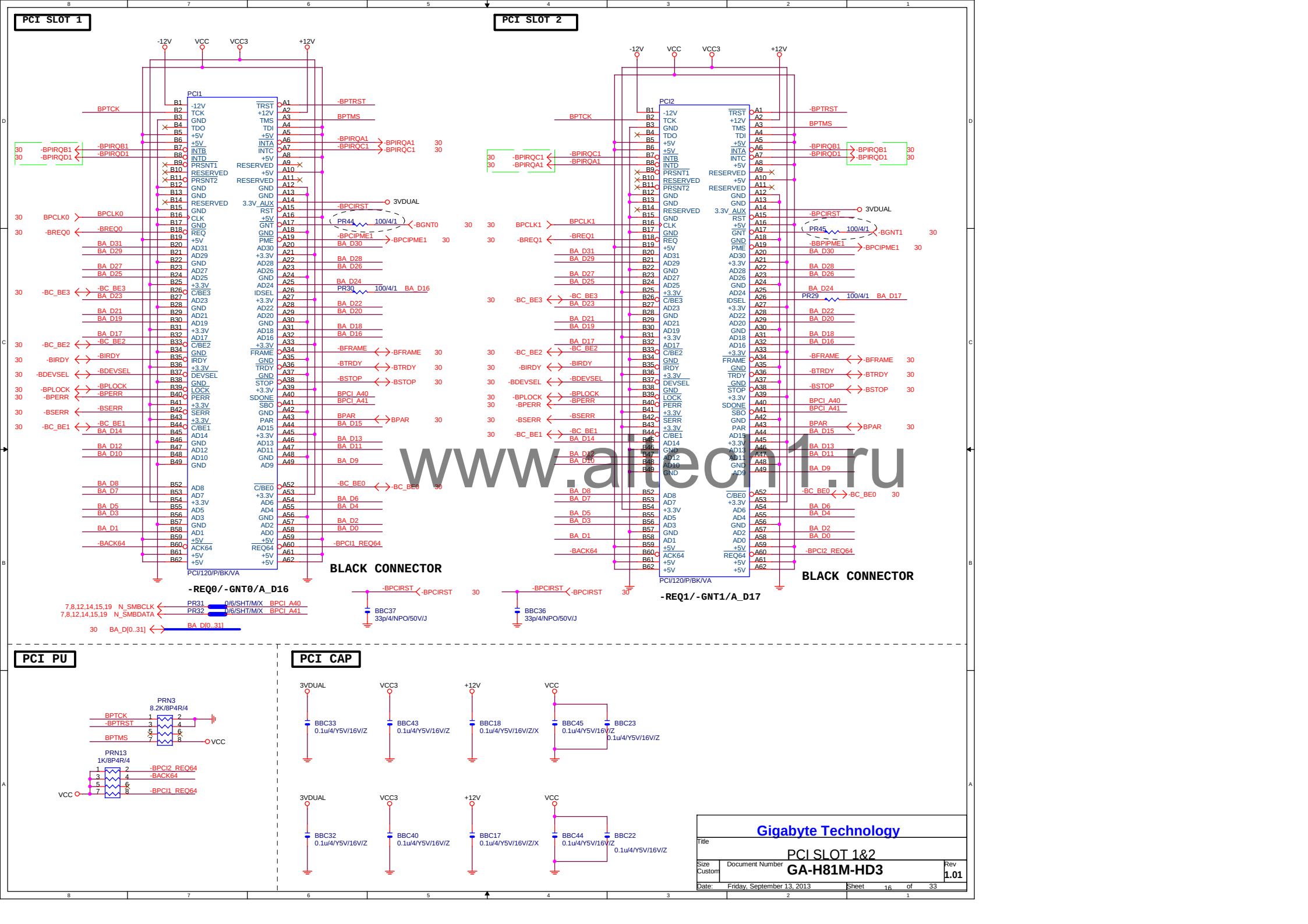
PCIEX1 SLOT

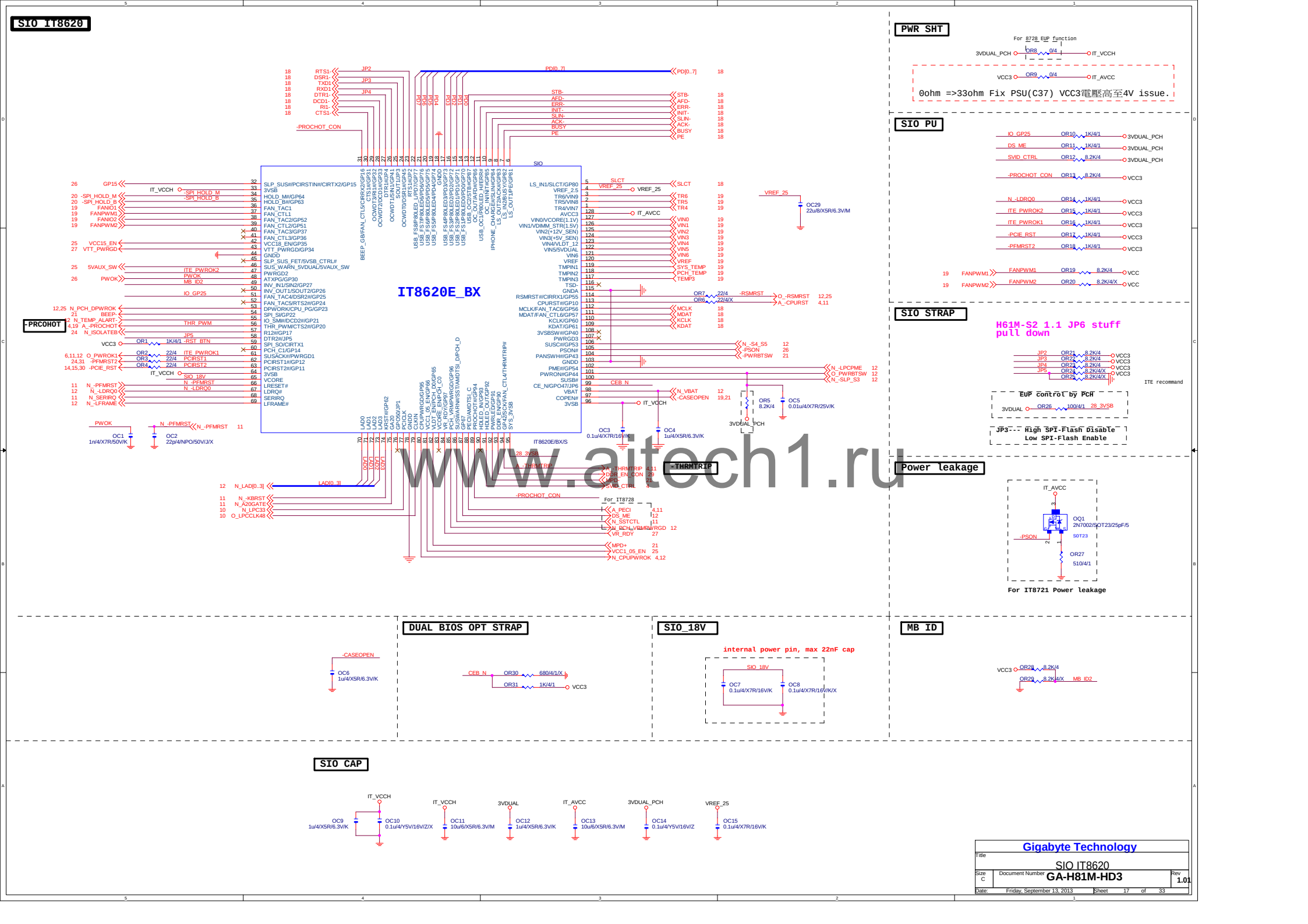


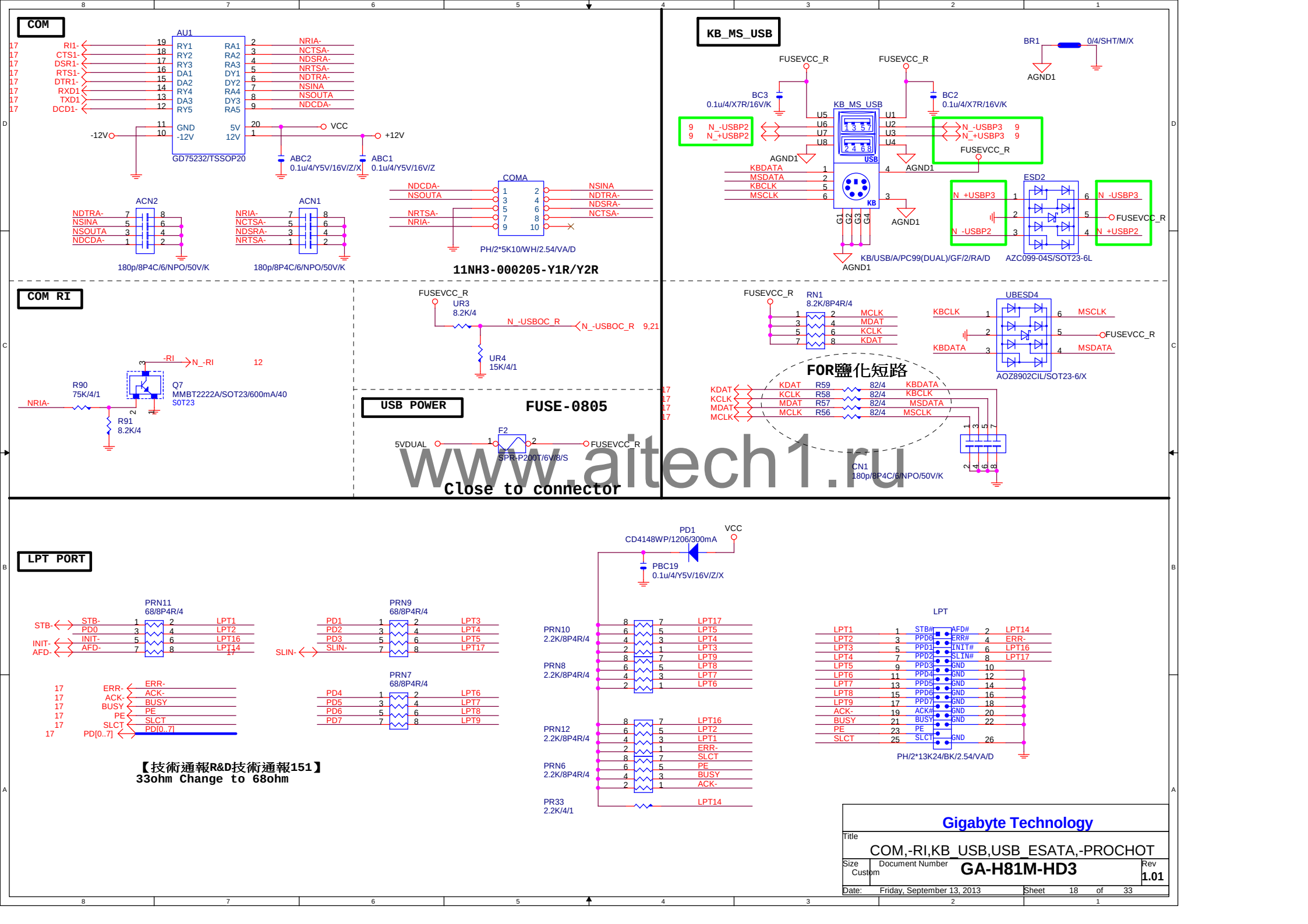




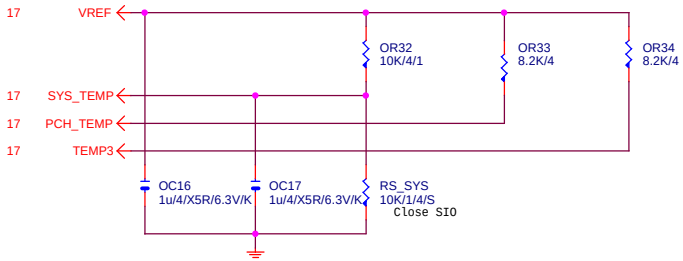
Gigabyte Technology		
Title: PCI EXPRESS X 1 PORT		
Size: Custom	Document Number: GA-H81M-HD3	Rev: 1.01
Date: Friday, September 13, 2013	Sheet 15 of 33	


PCI SLOT 1
PCI SLOT 2
PCI1
PCI2
PCI PU
PCI CAP
BLACK CONNECTOR
BLACK CONNECTOR
-REQ0/-GNT0/A_D16
-REQ1/-GNT1/A_D17
www.altech1.ru
Gigabyte Technology
PCI SLOT 1&2
GA-H81M-HD3
1.01
Friday, September 13, 2013

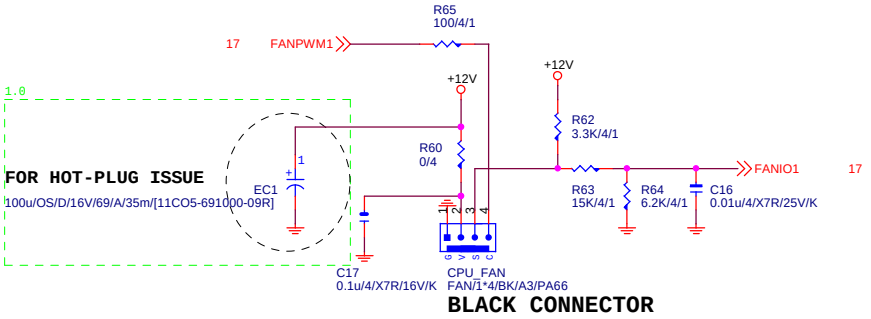

SIO IT8620
IT8620E_BX
PWR SHT
For 8728 EUP function
3VDUAL_PCH
IT_VCCH
VCC3
IT_AVCC
0ohm =>33ohm Fix PSU(C37) VCC3電壓高至4V issue.
SIO PU
SIO STRAP
H61M-S2 1.1 JP6 stuff pull down
EUP control by PCH
JP3-- High SPI-Flash Disable
Low SPI-Flash Enable
ITE recommand
Power leakage
For IT8721 Power leakage
DUAL BIOS OPT STRAP
SIO_18V
internal power pin, max 22nF cap
MB ID
SIO CAP
-PRCOHOT
-THRMTRIP
-PROCHOT_CON
-CASEOPEN
www.aitech1.ru
Gigabyte Technology
SIO IT8620
GA-H81M-HD3
Rev 1.01
Friday, September 13, 2013
Sheet 17 of 33



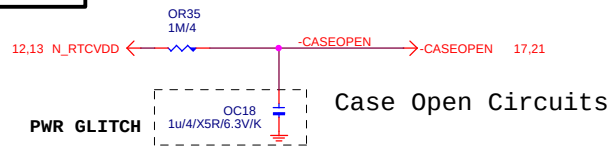
TEMP H/W MONITOR



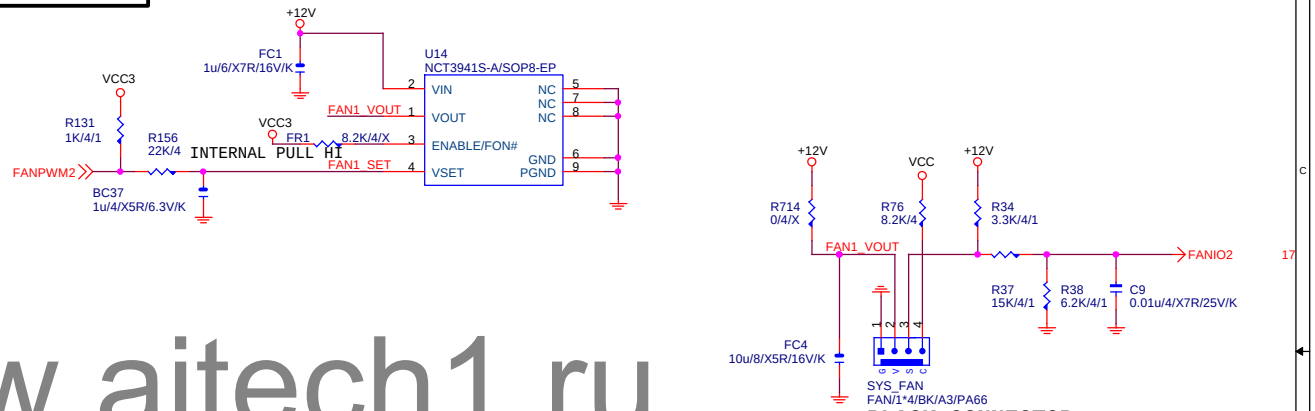
CPU SMART FAN



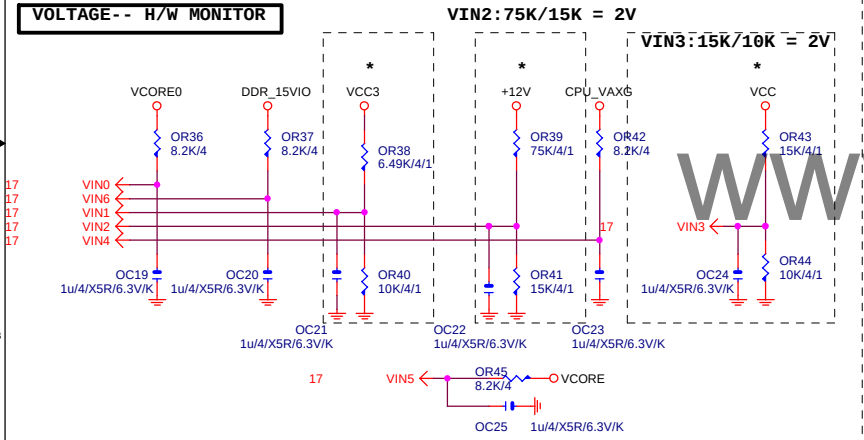
CASE OPEN



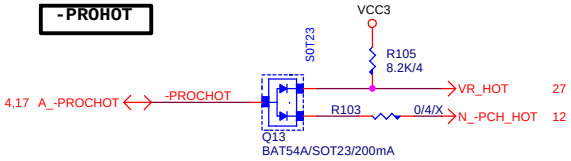
SYS SMART FAN

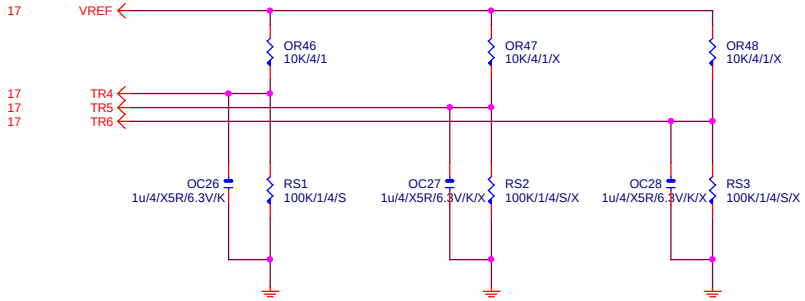


VOLTAGE-- H/W MONITOR



-PROHOT

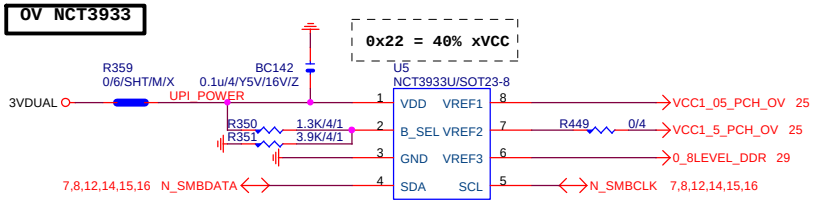




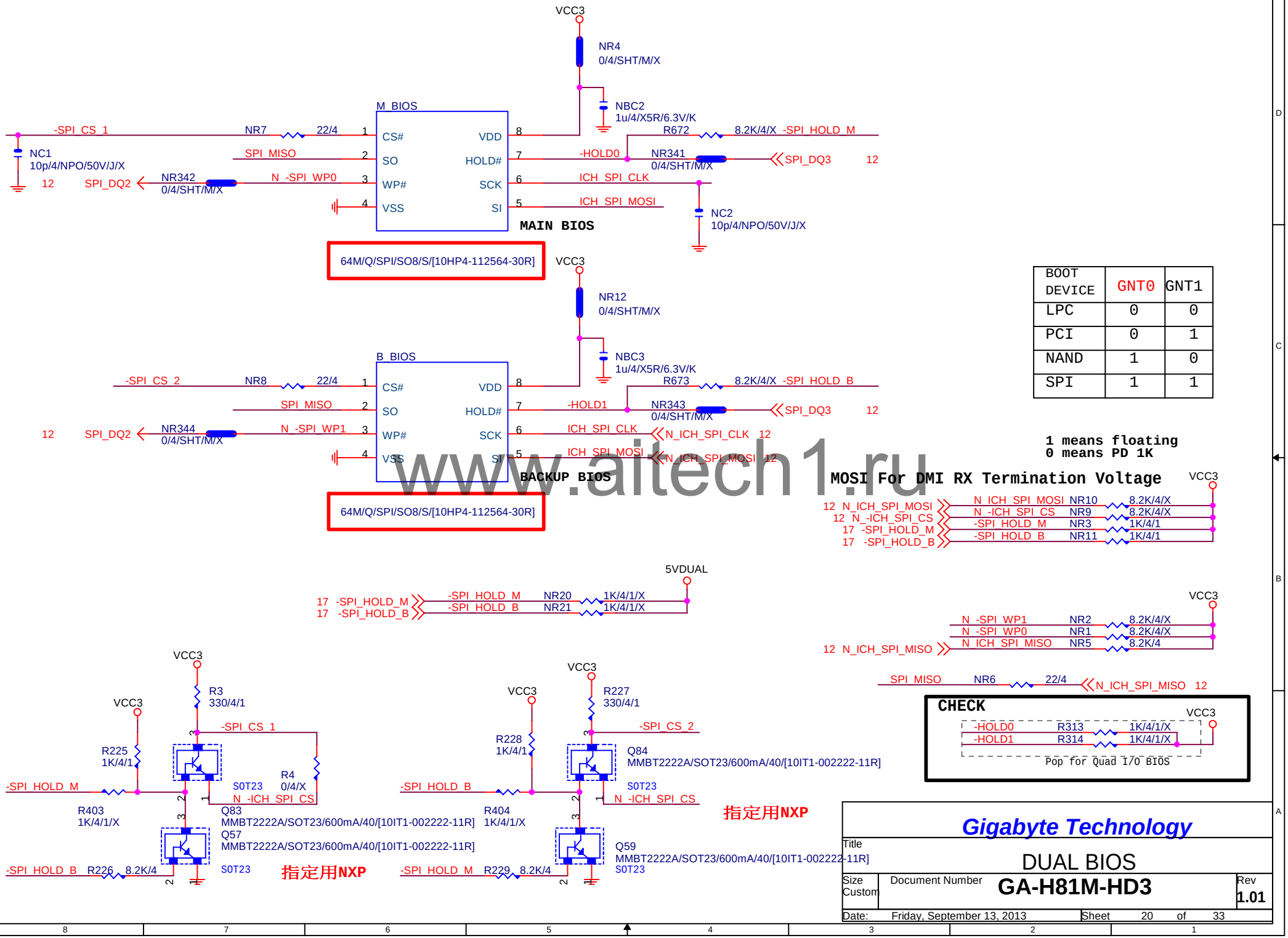
RS1、RS2、RS3 CLOSE CPU
VR MOSFET

接pwm feedback pin

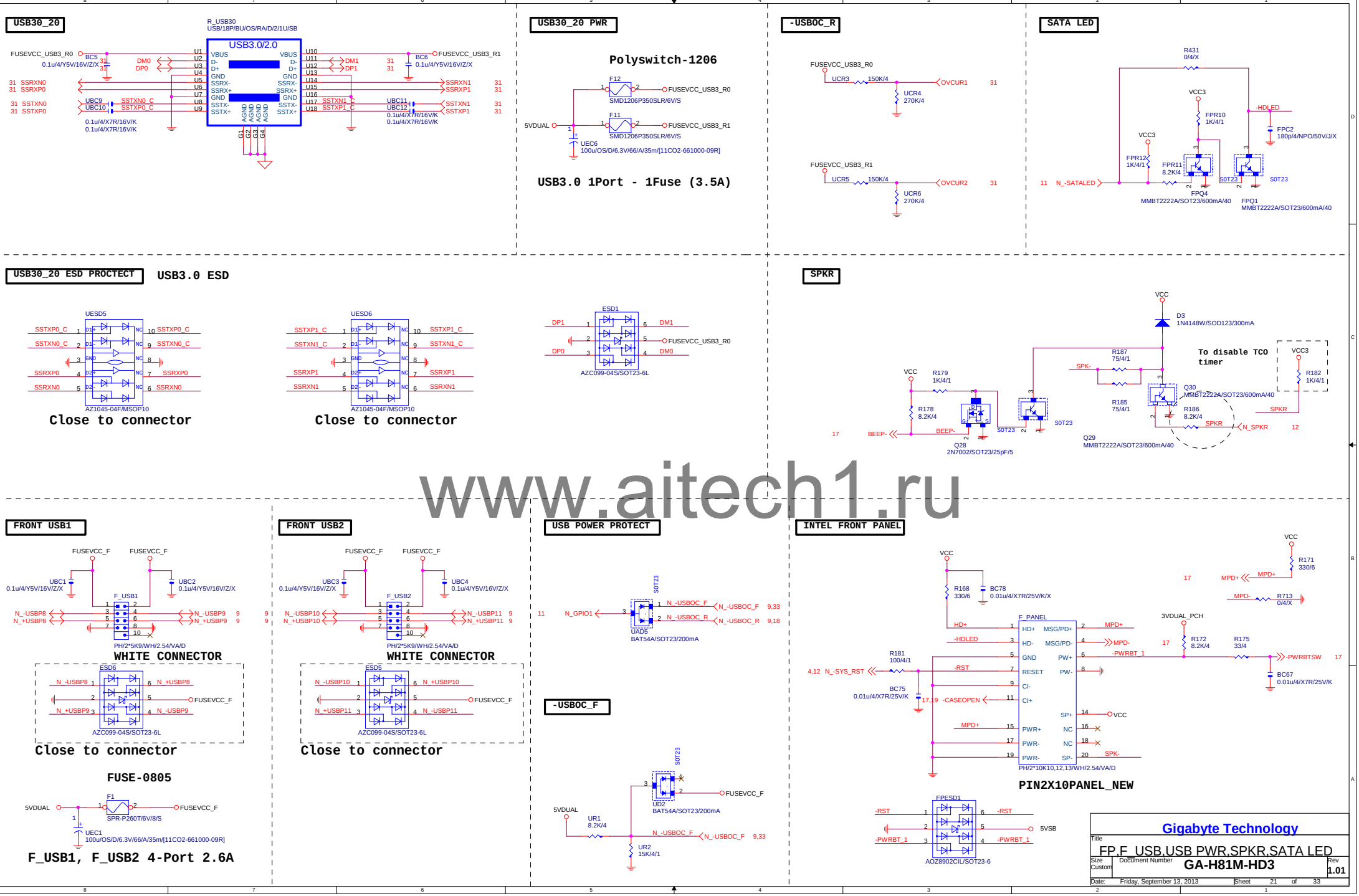
OV NCT3933



Gigabyte Technology	
Title	HWM,FAN CTRL,OV
Size: Custom	Document Number: GA-H81M-HD3
Rev: 1.01	
Date: Friday, September 13, 2013	Sheet 19 of 33

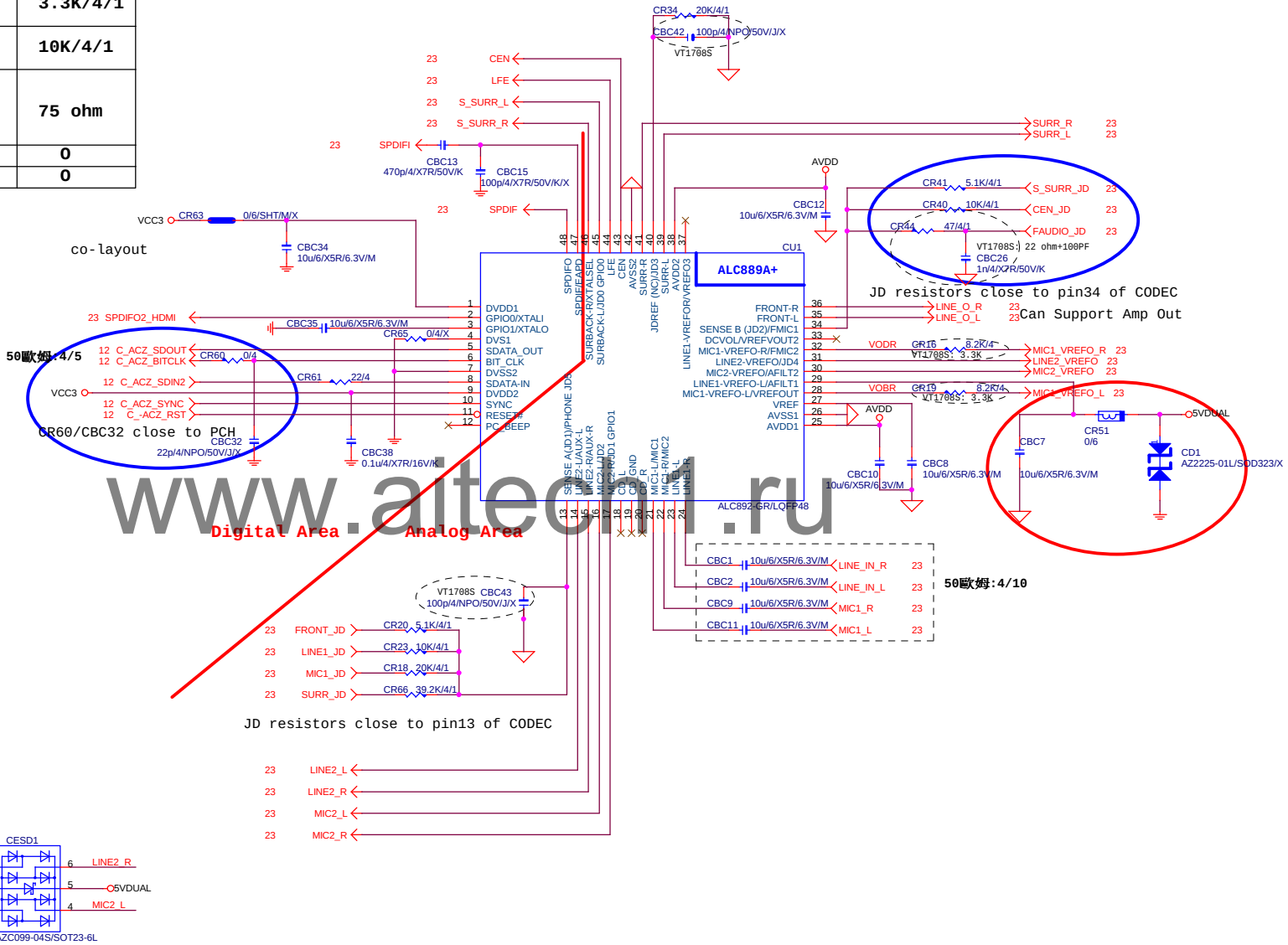


Gigabyte Technology		
Title: DUAL BIOS		
Size: Custom	Document Number: GA-H81M-HD3	Rev: 1.01
Date: Friday, September 13, 2013	Sheet 20 of 33	



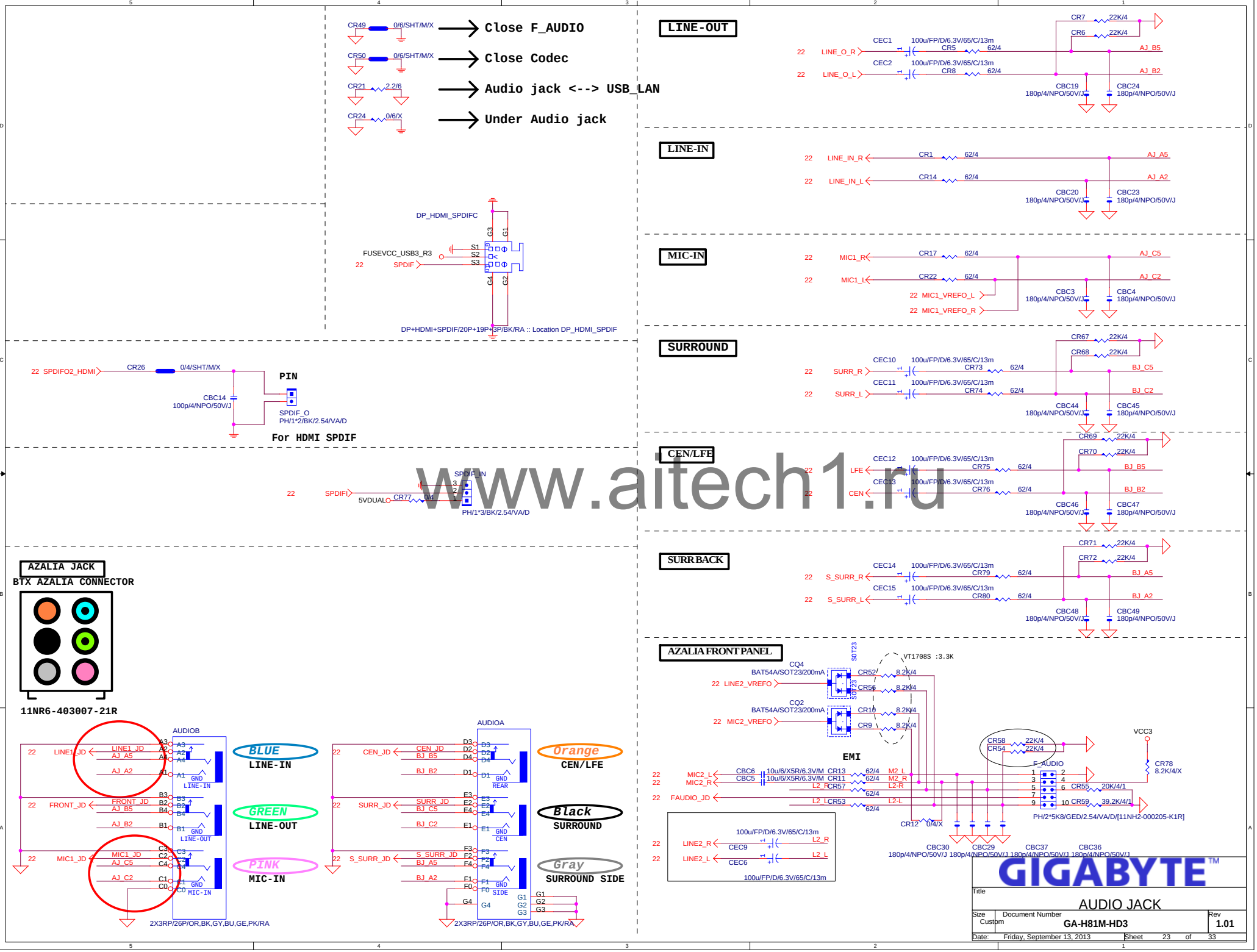
AZALIA CODEC *ALC892/ALC887-VD2/VT1708-CE Colay*

	ALC892	ALC887-VD2	VT1708S-CE
CR44/CBC26	47ohm+1nF	47ohm+1nF	22ohm+100P
CBC42/CBC43	X	X	100P/4
CR16/CR19 CR52/CR56/CR10/CR9	8.2K/4	8.2K/4	3.3K/4/1
CR6/CR7/CR58/CR54/ CR67/CR68/CR69/CR70	22K/4	22K/4	10K/4/1
CR5/CR8/CR1/CR14/ CR17/CR22/CR73/CR74/ CR13/CR11/CR57/CR53/ CR75/CR76	62 ohm	62 ohm	75 ohm
CR51/CD1/CBC7	0	0	0
CESD1	0	0	0

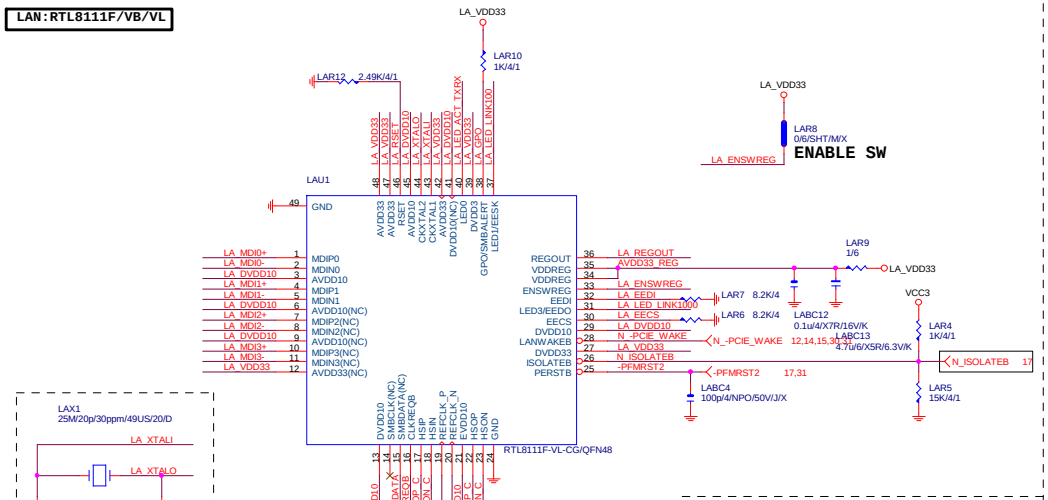


GIGABYTE™

Title	HD AUDIO ALC892	
Size: Custom	Document Number: GA-H81M-HD3	Rev: 1.01
Date: Friday, September 13, 2013	Sheet 22 of 33	



LAN:RTL8111F/VB/VL

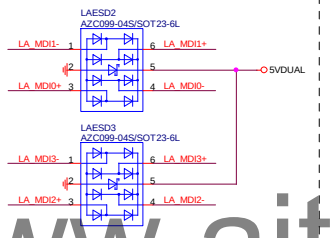


LA_ ML-->80歐姆:[15/5/5/5/15]

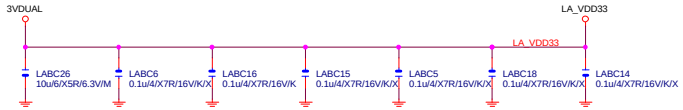
SRCCLK-->50歐姆:[18/4/10/4/18]

離IC近越好

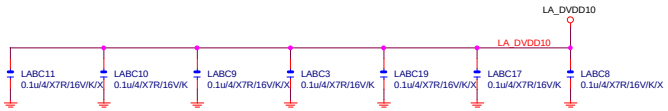
MDI ESD預留28KV *



LAN POWER

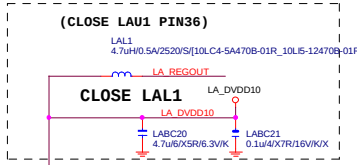


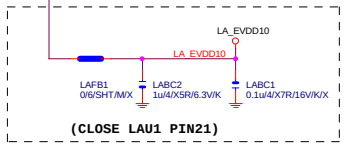
(CLOSE LAU1 PIN:12,27,39,42,47,48)



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

(CLOSE LAU1 PIN36)





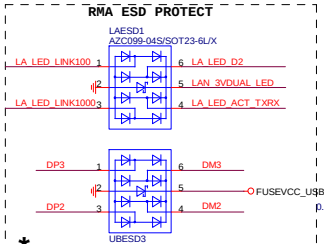
(CLOSE LAU1 PIN21)

Power domain chart

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

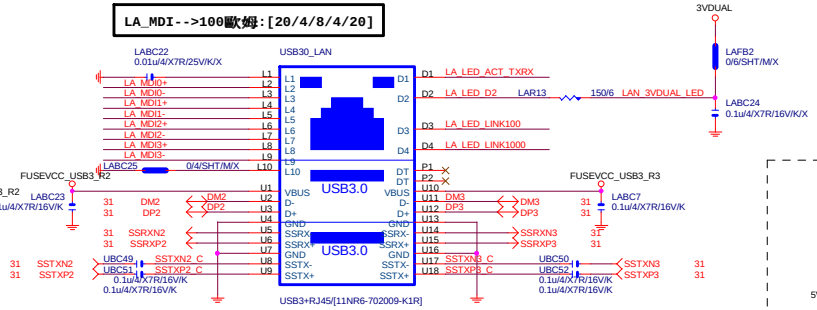
USB_LAN CONNECTOR

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]

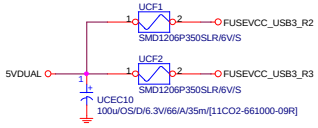


注意:USB PORT(目前:暫代6,7PORT)
USB-->90歐姆:[15/4.5/7.5/4.5/15]

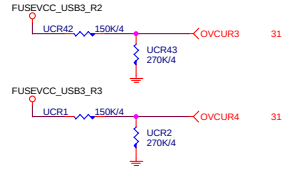
EMI SHORT PAD

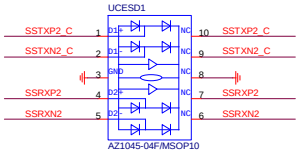
PS:視EMI需求

Polyswitch-1206

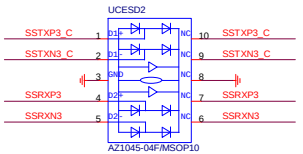


USB3.0 1Port - 1Fuse (3.5A)

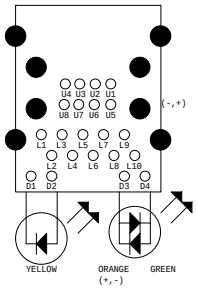




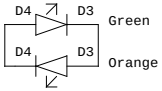
Close to connector



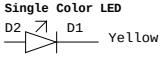
Close to connector



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-HD3 | Rev: 1.01

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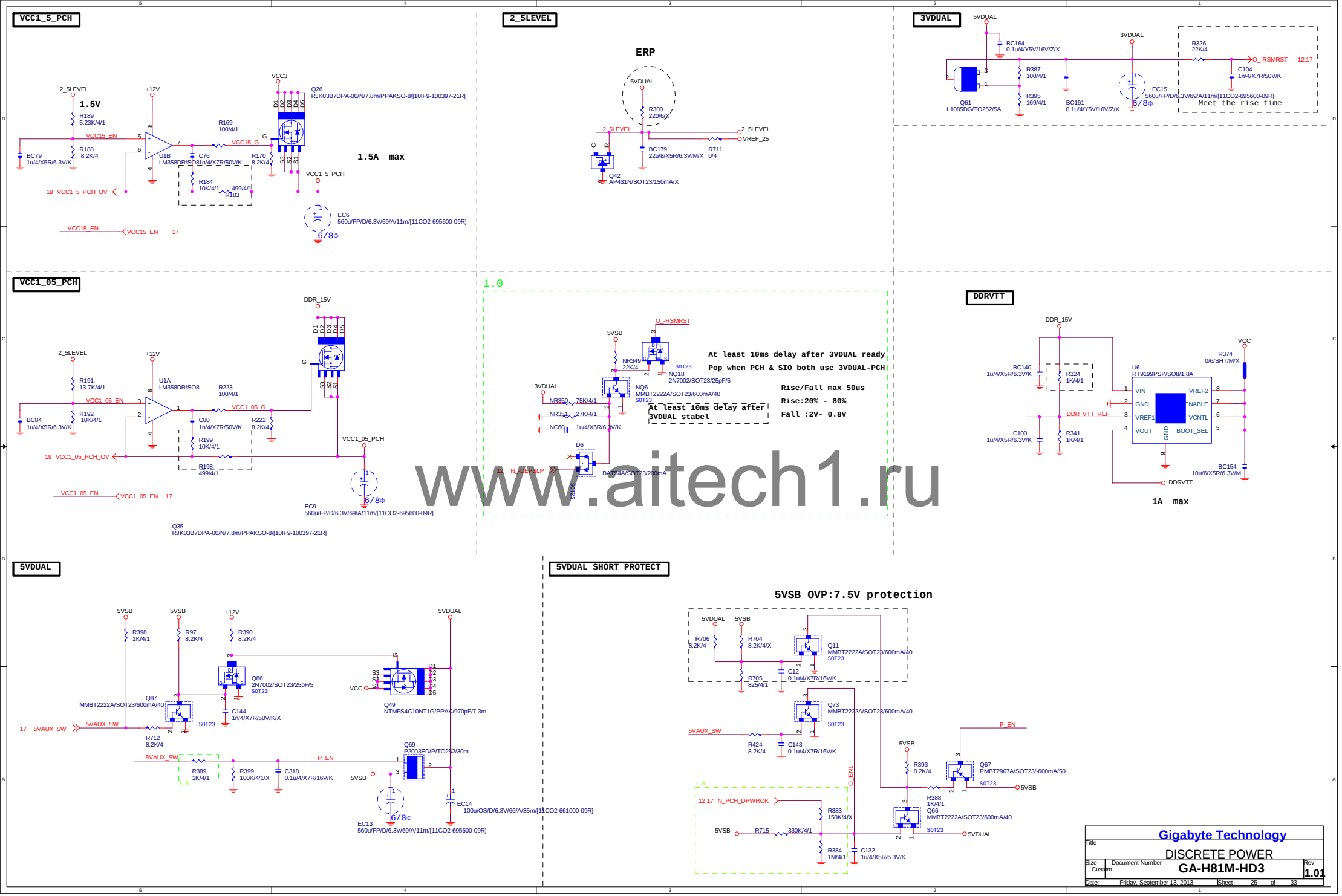
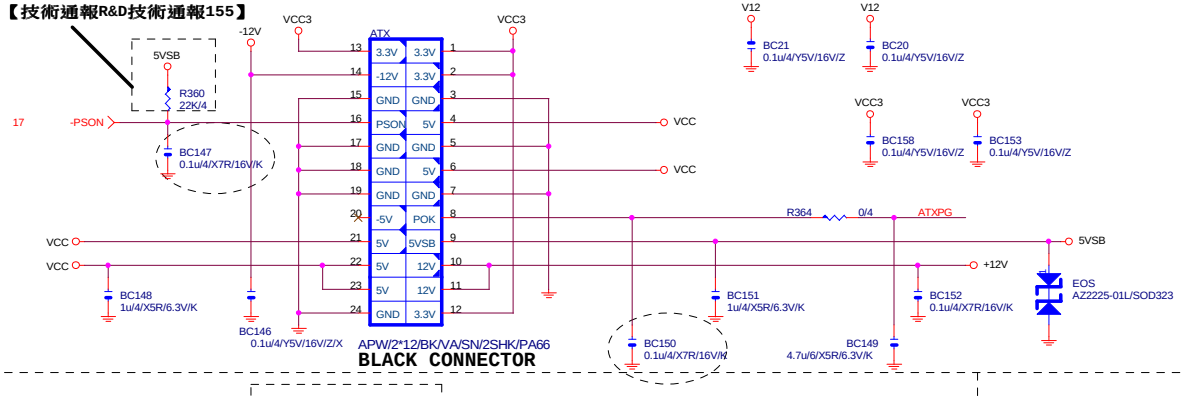


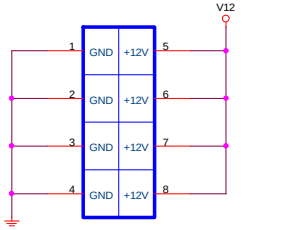
ATXX24 POWER CONNECTOR

【技術通報R&D技術通報155】



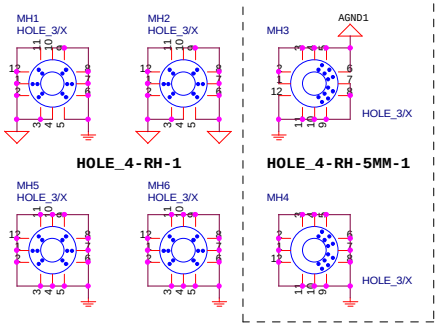
BLACK CONNECTOR

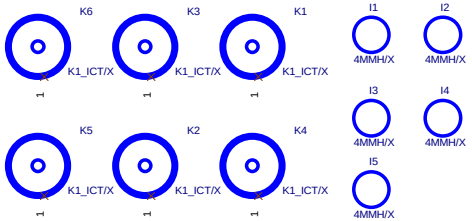
ATXX4 POWER CONNECTOR



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

BLACK CONNECTOR

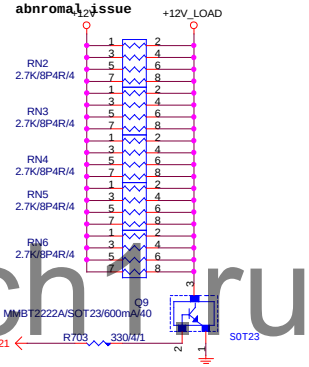




To prevent the 5VSB under loading when boot

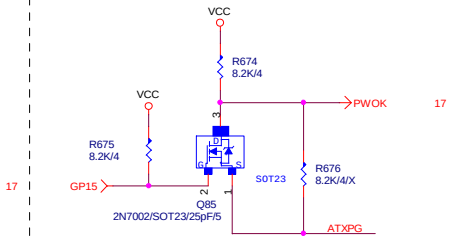
【技術通報R&D技術通報153】

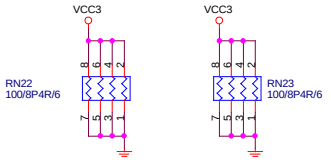
To fix 12V light load abnormal issue



PWOK PATCH

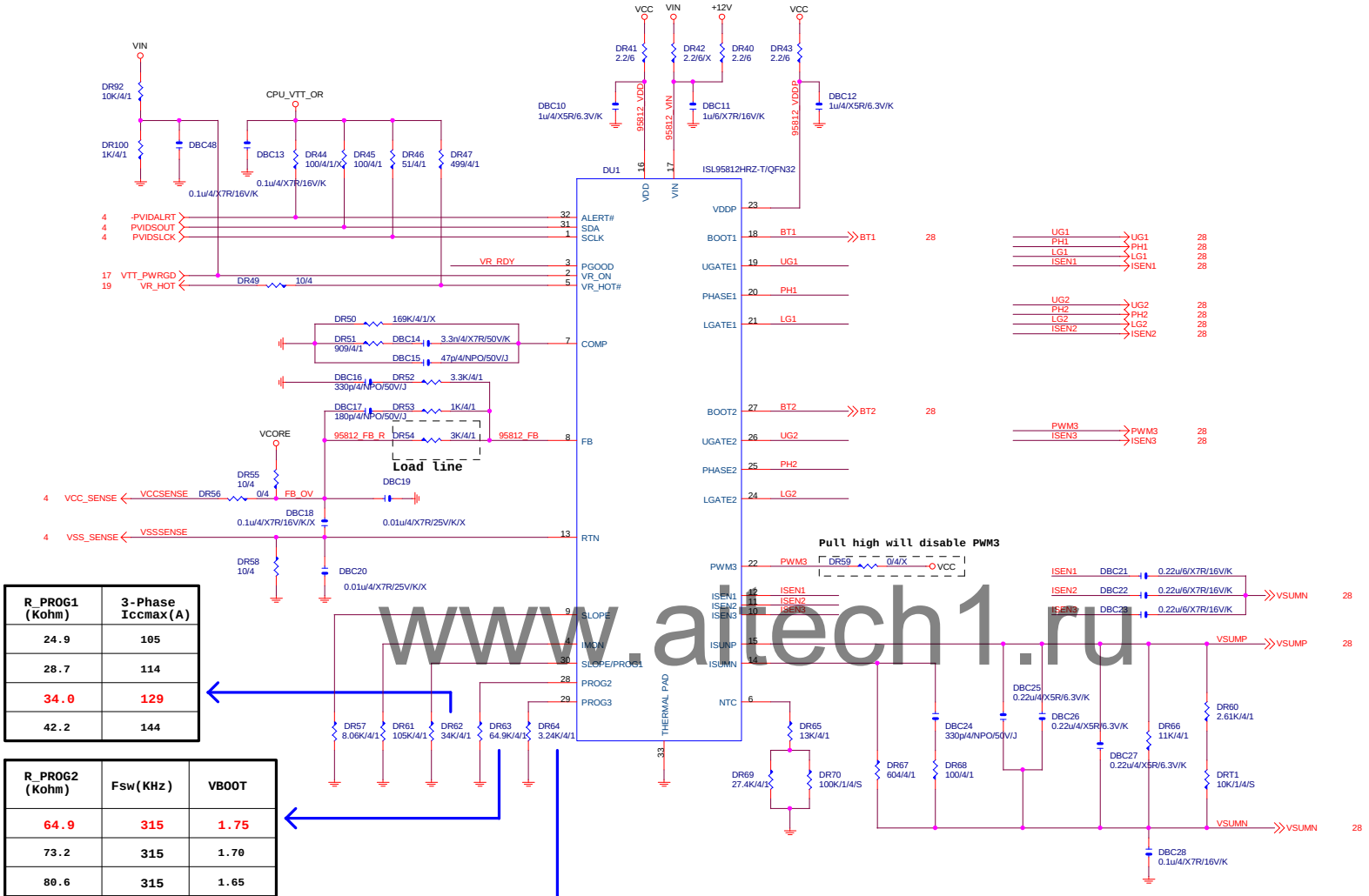
【技術通報R&D技術通報154】





FIX PWR MINMUN LOAD

Gigabyte Technology		
Title: ATX CONNECTOR		
Size: Custom	Document Number: GA-H81M-HD3	Rev: 1.01
Date: Friday, September 13, 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-HD3 | Rev: 1.01

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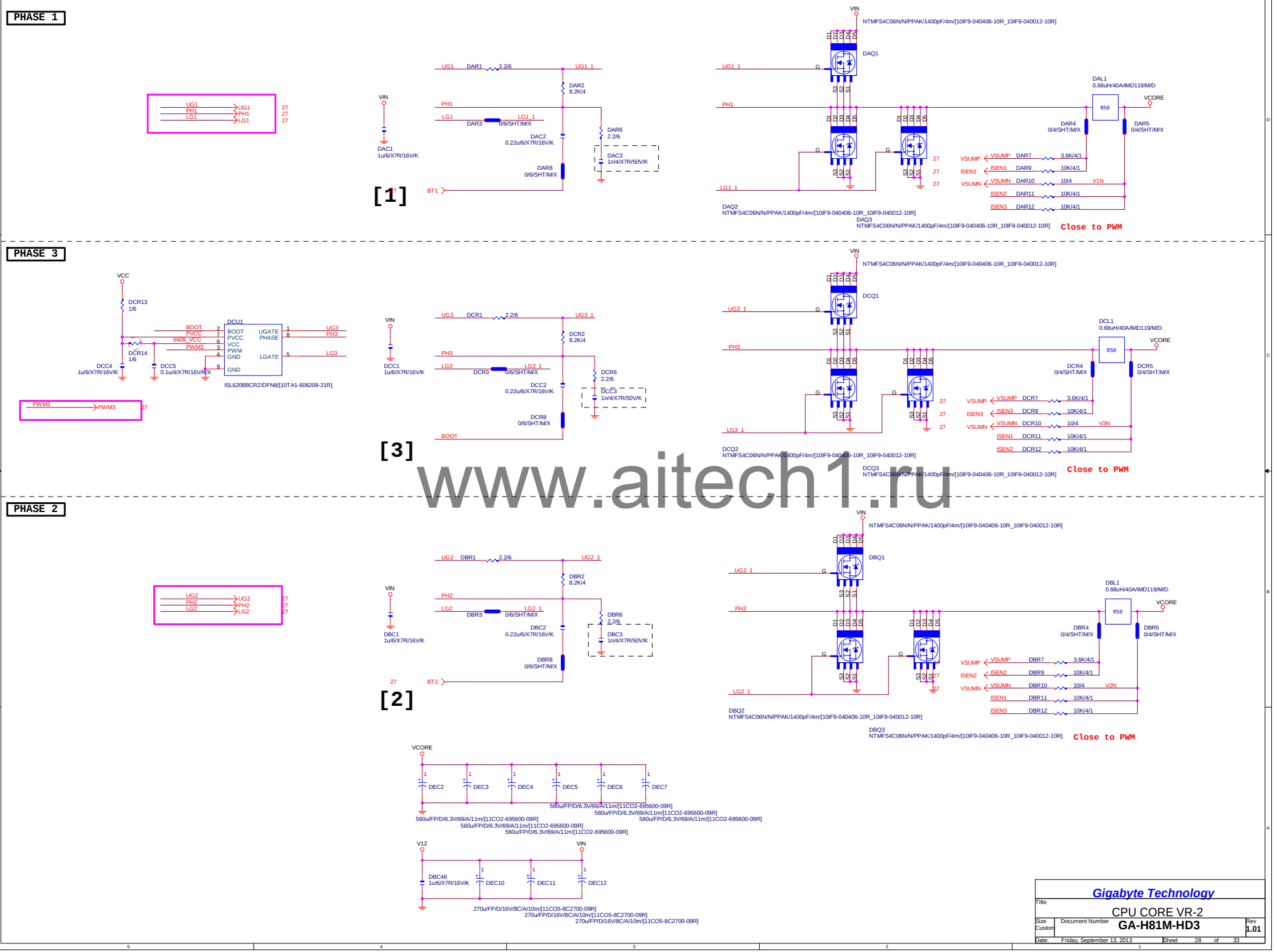

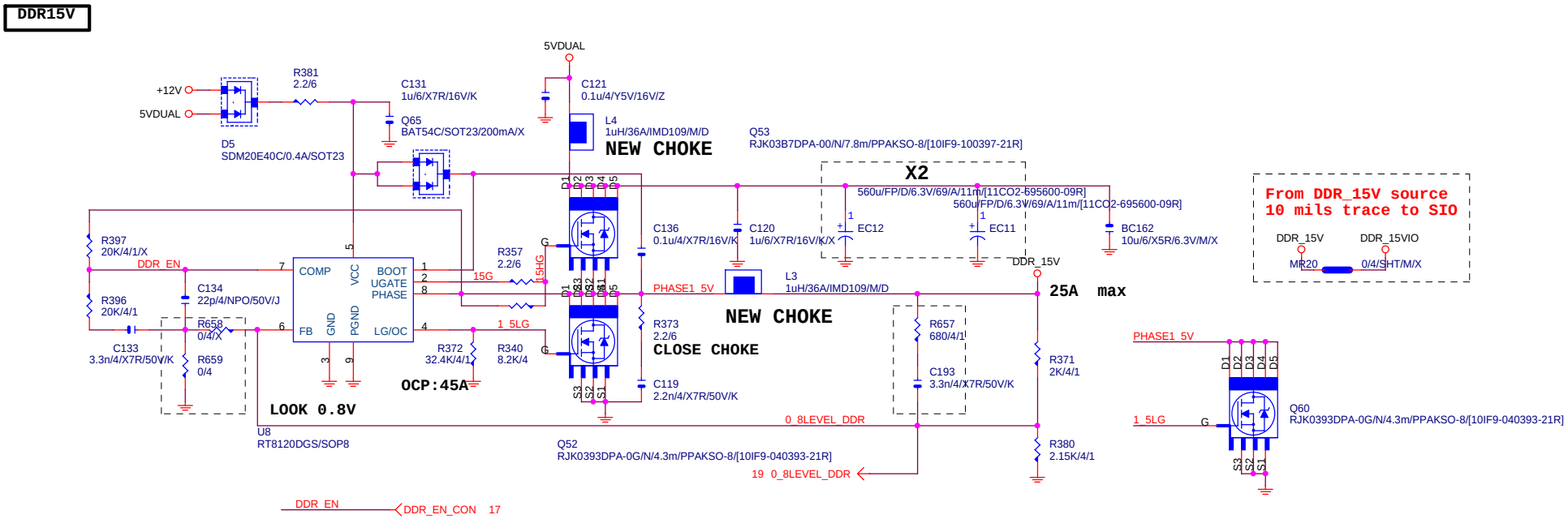

PWR SEQ

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

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

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

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

Gigabyte Technology			
Title: RT8120_DDR POWER			
Size: Custom	Document Number: GA-H81M-HD3		Rev: 1.01
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PCIE TO PCI

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

Co-Lay IT8893 (IT8893 CLKOUT1 N/A)

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

IT8892: PR46 -> X
IT8893: PR46 -> 0

IT8892: PR19 -> 0
IT8893: PR19 -> X

High: Enable PCI CLK 66MHz
Low: Disable PCI CLK 66MHz

High: PCICLK INTPUT form CLK Gen
Low: PCICLK OUTPUT form IT8893 chip

IT8892E/BX LQFP128

IT8892E/FX/S

PCB layout note:
Close to chip

Close to chip

Gigabyte Technology	
Title	ITE IT8892E
Size: Custom	Document Number: GA-H81M-HD3
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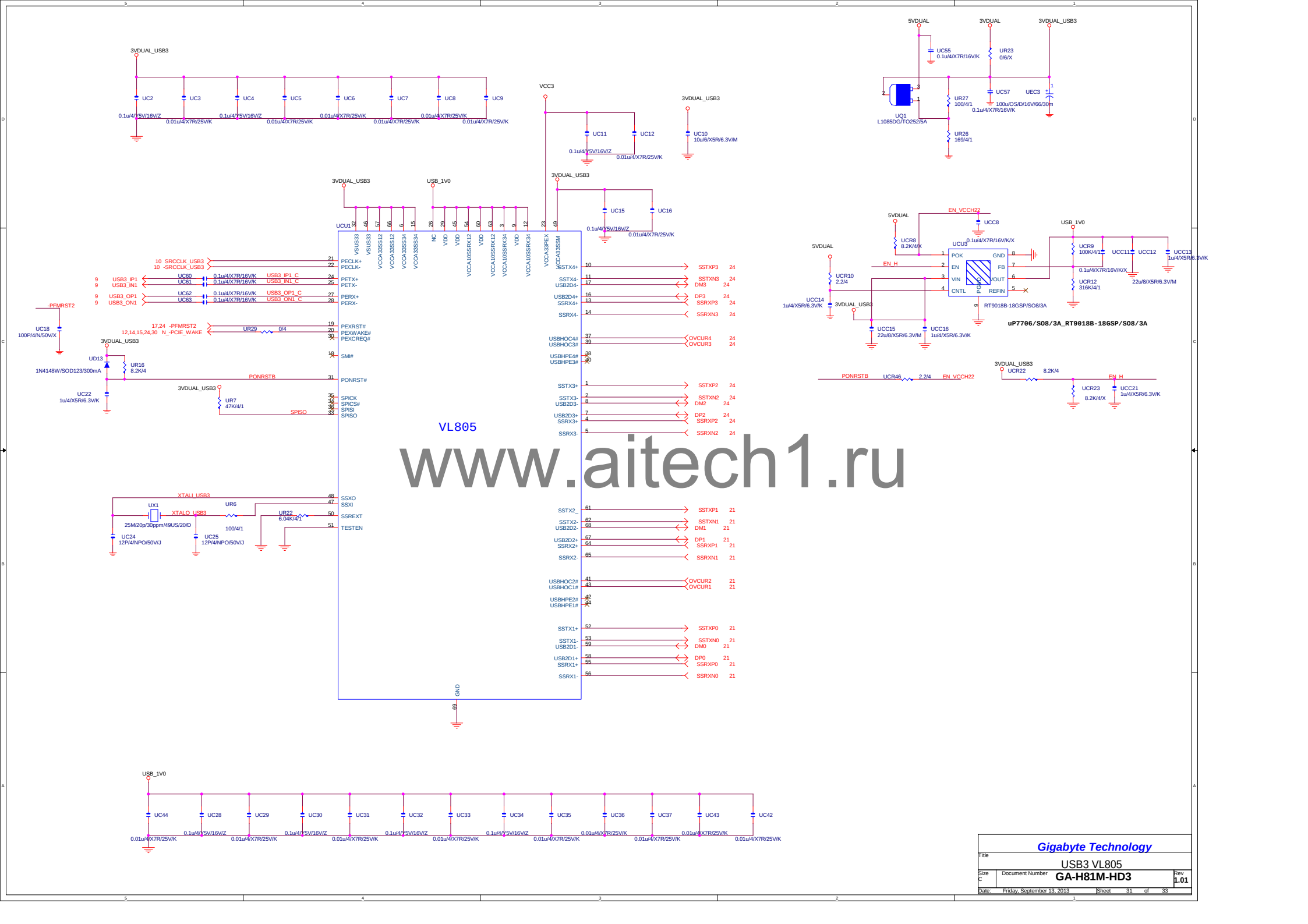

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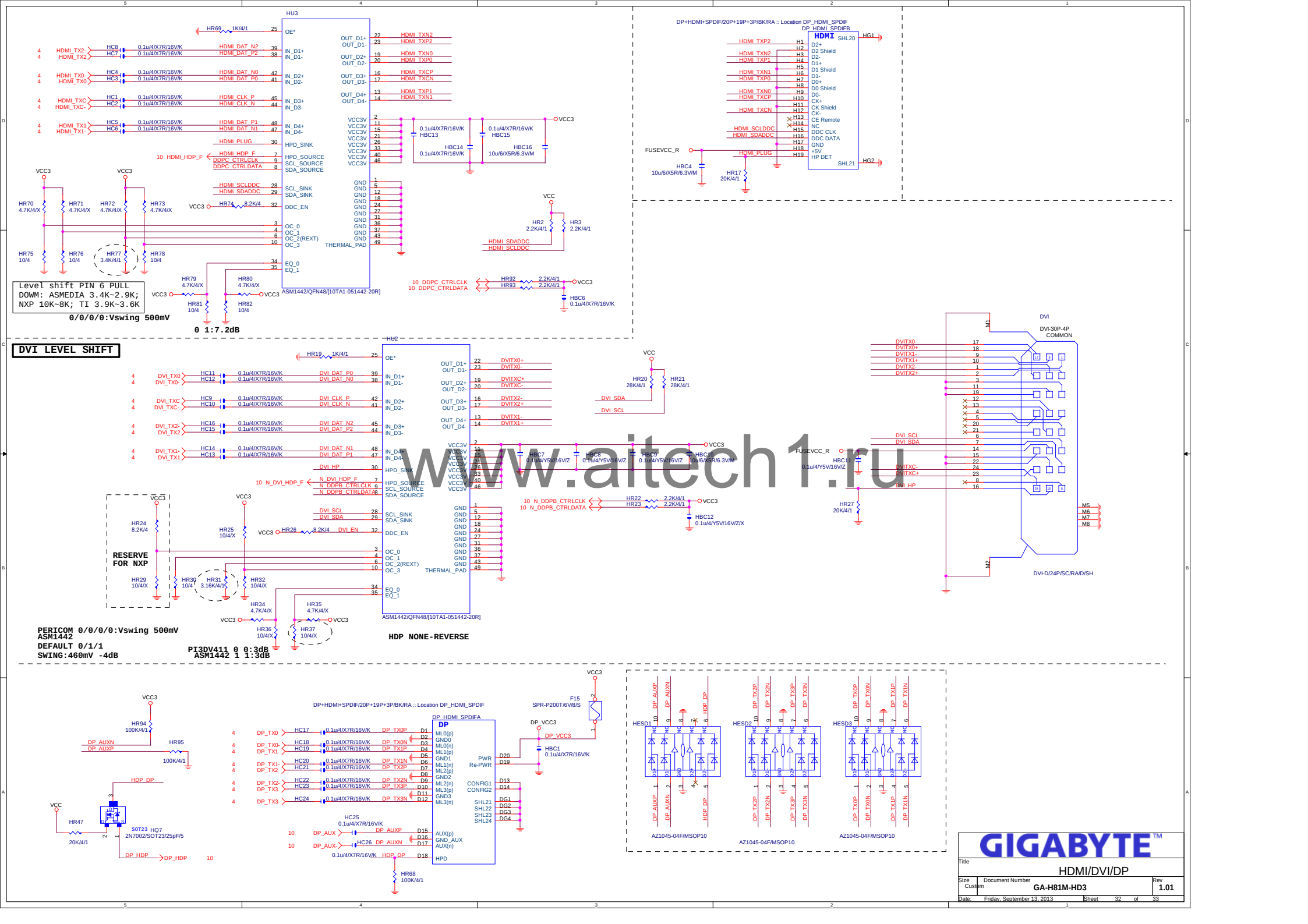
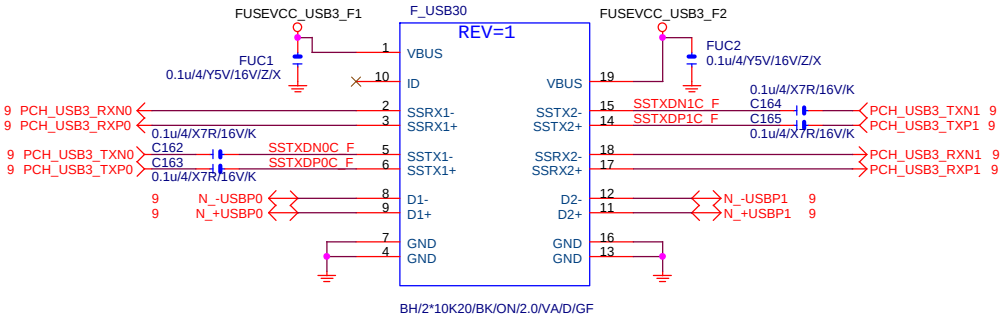
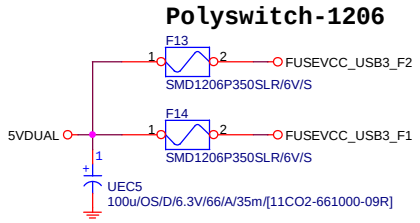


F_USB30

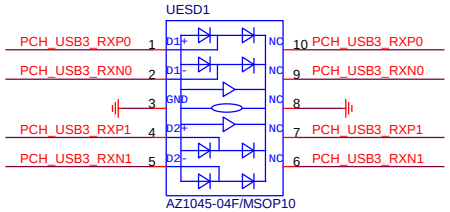


BLACK CONNECTOR

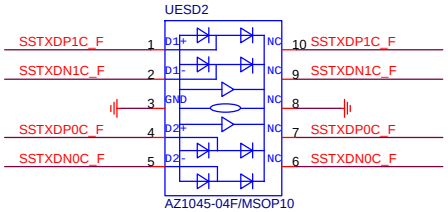
F_USB30 PWR



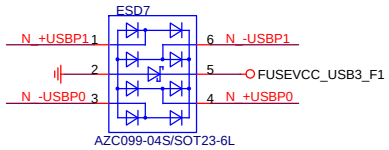
USB3.0 1Port - 1Fuse (3.5A)



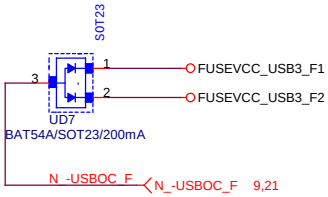
Close to connector



Close to connector



Close to connector



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