Model Name: GA-Z87X-UD5 TH

Rev 1.12 2013.08.19

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01	COVER SHEET
02	BOM & PCB MODIFY HISTORY
03	BLOCK DIAGRAM
04-06	CPU_LGA1150
07	DDR III CHANNEL A
08	DDR III CHANNEL B
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11	PCH_HOST,SATA,PCI
12	PCH_GPIO,CTRL,AUDIO
13	PCH_PWR,GND
14	HDMI / DVI (Switch) / TPM
15	PCI EXPRESS*16 SLOT
16	PCI EXPRESS*8 SLOT
17	PCI EXPRESS SWITCH X16/X8/X4
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19	PCI EXPRESS*4 SLOT
20	ITE 8892
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22	Dual BIOS
23	ALC898
24	REAR AUDIO JACK
25	AMPLIFIER
26	IR3563B PWM
27-28	IR3550 VCORE 16 Phase
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33	I/O ITE8728
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36	F_USB 2.0
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43-44	USB3.0 HUB uPD720210
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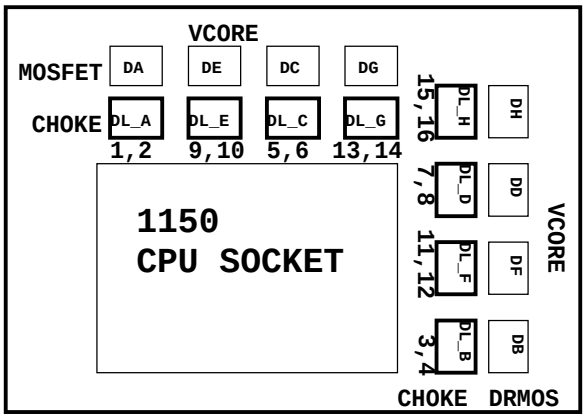
47	PLX8605
48	mini PCIE Slot
49	EC ITE 8790
50	DVI / mDP Switch 412
51-54	Thunderbolt RR 4C



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Title: Cover Sheet		
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GA-Z87X-UD5 TH

Component value change history

Data	Change Item	Reason
2012/12/05	0.1 SCH Modify from Z87X-UD3H Modify Item: 1. Vcore change to 16 phase 2. PLX8605 3. Thunderbolt RR 4C 4. Change USB3 Host to HUB 5. Front USB3 add USB charger 6. ITE8790 EC 7. mini PCIE slot	First Release
2013/07/17	1.1 SCH PVT	
2013/08/19	1.12 SCH PVT	

Circuit or PCB layout change

DATE	Change Item	Reason
2013/01/	REV0.1 Z87X-UD4 TH 0.1 gerber out	
2013/07/17	1.1 SCH PVT	
2013/08/19	1.12 SCH PVT RHX1 REFENCE GND 調整CLK與NX1的距離	

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Title: BOM & PCB MODIFY HISTORY

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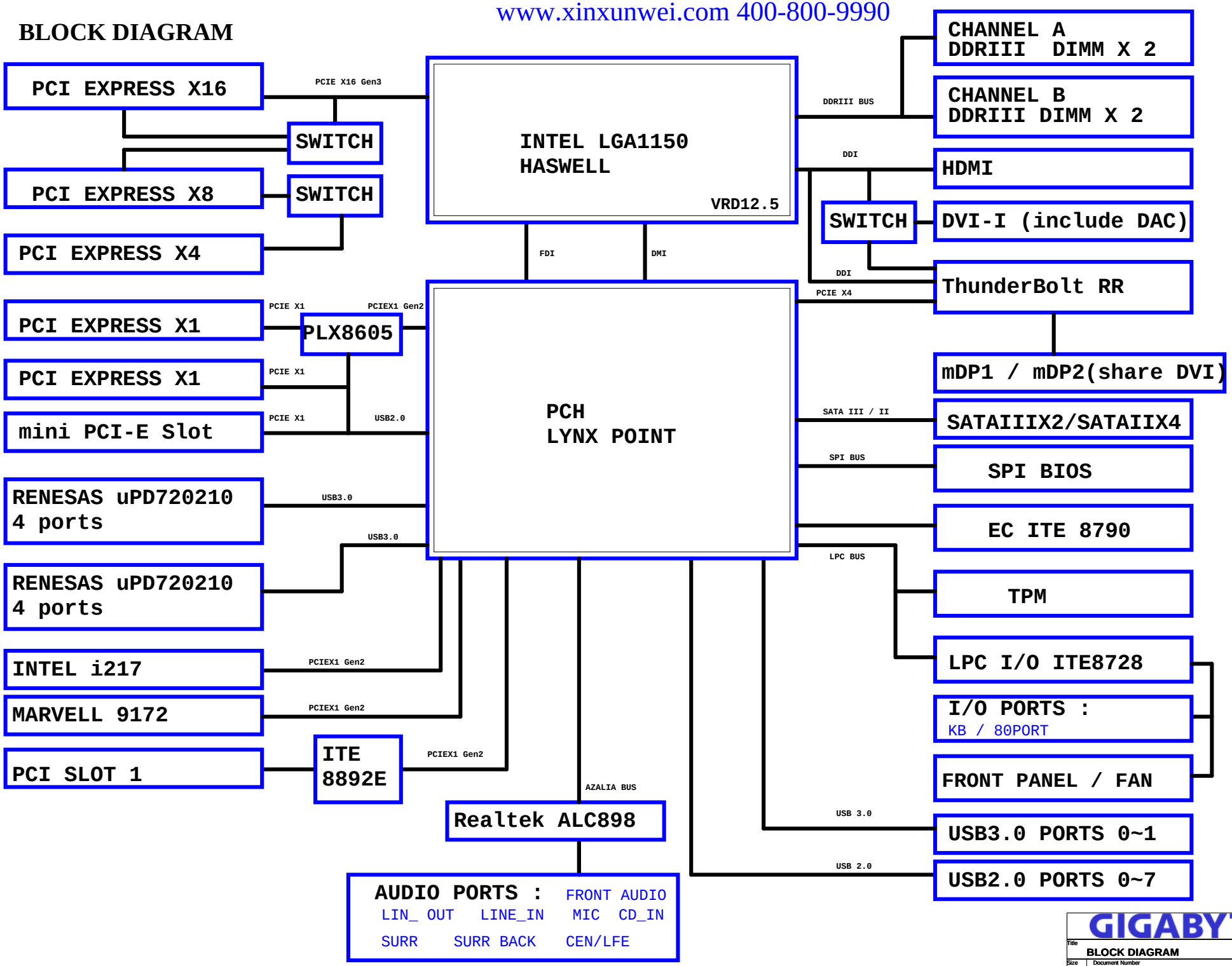
BLOCK DIAGRAM



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Title	BLOCK DIAGRAM	
Size C	Document Number GA-Z87X-UD5 TH	Rev 1.12
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DDI1: DVI & mDP
DDI2: HDMI
DDI3: mDP

CFG	H	L	NOTE
0	RSVD	RSVD	RSVD
1	RSVD	RSVD	RSVD
2	NORM	Reverse	LANE_REVERSAL[0],x16
3	RSVD	RSVD	RSVD
4	RSVD	RSVD	RSVD
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

Title	CPU LGA1150-A
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LGA1150A

MAAA0 MAAA1 MAAA2 MAAA3 MAAA4 MAAA5 MAAA6 MAAA7 MAAA8 MAAA9 MAAA10 MAAA11 MAAA12 MAAA13 MAAA14 MAAA15 — AU13 AV16 AU16 AW17 AU17 AW18 AV17 AT18 AU18 AT19 AW11 AV19 AU19 AY10 AT20 AU21

DDR0_MA0 DDR0_MA1 DDR0_MA2 DDR0_MA3 DDR0_MA4 DDR0_MA5 DDR0_MA6 DDR0_MA7 DDR0_MA8 DDR0_MA9 DDR0_MA10 DDR0_MA11 DDR0_MA12 DDR0_MA13 DDR0_MA14 DDR0_MA15

MODT_A0 MODT_A1 MODT_A2 MODT_A3 — AW10 AY8 AW9 AU8

DDR0_ODT0 DDR0_ODT1 DDR0_ODT2 DDR0_ODT3

AW33 AV33 AU31 AV31 AT33 AU33 AT31 AW31

DDR0_ECC0 DDR0_ECC1 DDR0_ECC2 DDR0_ECC3 DDR0_ECC4 DDR0_ECC5 DDR0_ECC6 DDR0_ECC7

{7} SBAA0 {7} SBAA1 {7} SBAA2 — SBAA0 SBAA1 SBAA2 — AV12 AY11 AT21

DDR0_BA0 DDR0_BA1 DDR0_BA2

{7} CKEA0 {7} CKEA1 {7} CKEA2 {7} CKEA3 — CKEA0 CKEA1 CKEA2 CKEA3 — AV22 AT23 AU22 AU23

DDR0_CKE0 DDR0_CKE1 DDR0_CKE2 DDR0_CKE3

{7} -CSA0 {7} -CSA1 {7} -CSA2 {7} -CSA3 — -CSA0 -CSA1 -CSA2 -CSA3 — AU14 AV9 AU10 AW8

DDR0_CS_N0 DDR0_CS_N1 DDR0_CS_N2 DDR0_CS_N3

{7} DCLKA0 {7} -DCLKA0 {7} DCLKA1 {7} -DCLKA1 {7} DCLKA2 {7} -DCLKA2 {7} DCLKA3 {7} -DCLKA3 — DCLKA0 -DCLKA0 DCLKA1 -DCLKA1 DCLKA2 -DCLKA2 DCLKA3 -DCLKA3 — AY15 AY16 AW15 AV15 AY14 AW14 AW13 AY13

DDR0_CLK_P0 DDR0_CLK_N0 DDR0_CLK_P1 DDR0_CLK_N1 DDR0_CLK_P2 DDR0_CLK_N2 DDR0_CLK_P3 DDR0_CLK_N3

AW12 — RSVD

{7} -SRASA — -SRASA — AU12 — DDR0_RAS*

{7} -SWEA — -SWEA — AU11 — DDR0_WE*

AV20 — RSVD

AW27 — RSVD

{7} -SCASA — -SCASA — AU9 — DDR0_CAS*

{7,8} -DDR3_RST — WR61 0/4 — AK22 — DDR_RESET*

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

DDR0_DQ0 DDR0_DQ1 DDR0_DQ2 DDR0_DQ3 DDR0_DQ4 DDR0_DQ5 DDR0_DQ6 DDR0_DQ7 DDR0_DQ8 DDR0_DQ9 DDR0_DQ10 DDR0_DQ11 DDR0_DQ12 DDR0_DQ13 DDR0_DQ14 DDR0_DQ15 DDR0_DQ16 DDR0_DQ17 DDR0_DQ18 DDR0_DQ19 DDR0_DQ20 DDR0_DQ21 DDR0_DQ22 DDR0_DQ23 DDR0_DQ24 DDR0_DQ25 DDR0_DQ26 DDR0_DQ27 DDR0_DQ28 DDR0_DQ29 DDR0_DQ30 DDR0_DQ31 DDR0_DQ32 DDR0_DQ33 DDR0_DQ34 DDR0_DQ35 DDR0_DQ36 DDR0_DQ37 DDR0_DQ38 DDR0_DQ39 DDR0_DQ40 DDR0_DQ41 DDR0_DQ42 DDR0_DQ43 DDR0_DQ44 DDR0_DQ45 DDR0_DQ46 DDR0_DQ47 DDR0_DQ48 DDR0_DQ49 DDR0_DQ50 DDR0_DQ51 DDR0_DQ52 DDR0_DQ53 DDR0_DQ54 DDR0_DQ55 DDR0_DQ56 DDR0_DQ57 DDR0_DQ58 DDR0_DQ59 DDR0_DQ60 DDR0_DQ61 DDR0_DQ62 DDR0_DQ63 — AD38 AD39 AF38 AE39 AD37 AD40 AF37 AF40 AH40 AH39 AK38 AK39 AH37 AH38 AK37 AK40 AM40 AM39 AP38 AP39 AM37 AM38 AP37 AP40 AV37 AW37 AU35 AV35 AT37 AU37 AT35 AW35 AY6 AU6 AV4 AU4 AW6 AV6 AW4 AY4 AR1 AR4 AN3 AN4 AR2 AR3 AN2 AN1 AL1 AL4 AJ3 AL2 AL3 AJ2 AJ1 AG1 AG4 AE3 AE4 AG2 AG3 AF2 AE1 — MDA0 MDA1 MDA2 MDA3 MDA4 MDA5 MDA6 MDA7 MDA9 MDA13 MDA10 MDA11 MDA12 MDA8 MDA14 MDA15 MDA17 MDA21 MDA18 MDA19 MDA20 MDA16 MDA22 MDA23 MDA25 MDA29 MDA26 MDA27 MDA28 MDA24 MDA30 MDA31 MDA33 MDA37 MDA34 MDA35 MDA36 MDA32 MDA38 MDA39 MDA41 MDA45 MDA42 MDA43 MDA44 MDA40 MDA46 MDA47 MDA49 MDA53 MDA50 MDA51 MDA52 MDA48 MDA54 MDA55 MDA57 MDA61 MDA58 MDA59 MDA60 MDA56 MDA62 MDA63

DDR0_DQS_P0 DDR0_DQS_P1 DDR0_DQS_P2 DDR0_DQS_P3 DDR0_DQS_P4 DDR0_DQS_P5 DDR0_DQS_P6 DDR0_DQS_P7 DDR0_DQS_P8 DDR0_DQS_N0 DDR0_DQS_N1 DDR0_DQS_N2 DDR0_DQS_N3 DDR0_DQS_N4 DDR0_DQS_N5 DDR0_DQS_N6 DDR0_DQS_N7 DDR0_DQS_N8 — AE39 AJ39 AN39 AV36 AV5 AP3 AK3 AF3 AV32 AE38 AJ38 AN38 AU36 AW5 AP2 AK2 AF2 AU32 — DQSA0 DQSA1 DQSA2 DQSA3 DQSA4 DQSA5 DQSA6 DQSA7 -DQSA0 -DQSA1 -DQSA2 -DQSA3 -DQSA4 -DQSA5 -DQSA6 -DQSA7

HASWELL/[10SC1-F01150-01R]

LGA1150B

MAAB0 MAAB1 MAAB2 MAAB3 MAAB4 MAAB5 MAAB6 MAAB7 MAAB8 MAAB9 MAAB10 MAAB11 MAAB12 MAAB13 MAAB14 MAAB15 — AL19 AK23 AM22 AM23 AP23 AL23 AY24 AV25 AU26 AW25 AP18 AY25 AV26 AR15 AY27 AY28

DDR1_MA0 DDR1_MA1 DDR1_MA2 DDR1_MA3 DDR1_MA4 DDR1_MA5 DDR1_MA6 DDR1_MA7 DDR1_MA8 DDR1_MA9 DDR1_MA10 DDR1_MA11 DDR1_MA12 DDR1_MA13 DDR1_MA14 DDR1_MA15

MODT_B0 MODT_B1 MODT_B2 MODT_B3 — AM17 AL16 AM16 AK15

DDR1_ODT0 DDR1_ODT1 DDR1_ODT2 DDR1_ODT3

AM26 AM25 AP25 AP26 AL26 AL25 AR26 AR25

DDR1_ECC0 DDR1_ECC1 DDR1_ECC2 DDR1_ECC3 DDR1_ECC4 DDR1_ECC5 DDR1_ECC6 DDR1_ECC7

{8} SBAB0 {8} SBAB1 {8} SBAB2 — SBAB0 SBAB1 SBAB2 — AK17 AL18 AW28

DDR1_BA0 DDR1_BA1 DDR1_BA2

{8} CKEB0 {8} CKEB1 {8} CKEB2 {8} CKEB3 — CKEB0 CKEB1 CKEB2 CKEB3 — AW29 AY29 AU28 AU29

DDR1_CKE0 DDR1_CKE1 DDR1_CKE2 DDR1_CKE3

{8} -CSB0 {8} -CSB1 {8} -CSB2 {8} -CSB3 — -CSB0 -CSB1 -CSB2 -CSB3 — AP17 AN15 AN17 AL15

DDR1_CS_N0 DDR1_CS_N1 DDR1_CS_N2 DDR1_CS_N3

{8} DCLKB0 {8} -DCLKB0 {8} DCLKB1 {8} -DCLKB1 — DCLKB0 -DCLKB0 DCLKB1 -DCLKB1 — AM20 AM21 AP22 AP21

DDR1_CLK_P0 DDR1_CLK_N0 DDR1_CLK_P1 DDR1_CLK_N1

{8} DCLKB2 {8} -DCLKB2 {8} DCLKB3 {8} -DCLKB3 — DCLKB2 -DCLKB2 DCLKB3 -DCLKB3 — AN20 AN21 AP19 AP20

DDR1_CLK_P2 DDR1_CLK_N2 DDR1_CLK_P3 DDR1_CLK_N3

{8} -SCASB — -SCASB — AP16 — DDR1_CAS*

AL20 — RSVD

{8} -SRASB {8} -SWEB — -SRASB -SWEB — AM18 AK16 — DDR1_RAS* DDR1_WE*

{7} VREF_DQA {8} VREF_DQB — AB39 AB40 — DDR_VREF_DQ0 DDR_VREF_DQ1

DDR1_DQ0 DDR1_DQ1 DDR1_DQ2 DDR1_DQ3 DDR1_DQ4 DDR1_DQ5 DDR1_DQ6 DDR1_DQ7 DDR1_DQ8 DDR1_DQ9 DDR1_DQ10 DDR1_DQ11 DDR1_DQ12 DDR1_DQ13 DDR1_DQ14 DDR1_DQ15 DDR1_DQ16 DDR1_DQ17 DDR1_DQ18 DDR1_DQ19 DDR1_DQ20 DDR1_DQ21 DDR1_DQ22 DDR1_DQ23 DDR1_DQ24 DDR1_DQ25 DDR1_DQ26 DDR1_DQ27 DDR1_DQ28 DDR1_DQ29 DDR1_DQ30 DDR1_DQ31 DDR1_DQ32 DDR1_DQ33 DDR1_DQ34 DDR1_DQ35 DDR1_DQ36 DDR1_DQ37 DDR1_DQ38 DDR1_DQ39 DDR1_DQ40 DDR1_DQ41 DDR1_DQ42 DDR1_DQ43 DDR1_DQ44 DDR1_DQ45 DDR1_DQ46 DDR1_DQ47 DDR1_DQ48 DDR1_DQ49 DDR1_DQ50 DDR1_DQ51 DDR1_DQ52 DDR1_DQ53 DDR1_DQ54 DDR1_DQ55 DDR1_DQ56 DDR1_DQ57 DDR1_DQ58 DDR1_DQ59 DDR1_DQ60 DDR1_DQ61 DDR1_DQ62 DDR1_DQ63 — AE34 AE35 AG35 AH35 AD34 AD35 AG34 AH34 AL34 AL35 AK31 AL31 AK34 AK35 AK32 AL32 AN34 AP34 AN31 AP31 AN35 AP35 AN32 AP32 AM29 AM28 AR29 AR28 AL29 AL28 AP29 AP28 AR12 AP12 AL13 AL12 AR13 AP13 AM13 AM12 AR9 AP9 AR6 AP6 AR10 AP10 AR7 AP7 AM9 AL9 AL6 AL7 AM10 AL10 AM6 AM7 AH6 AH7 AE6 AE7 AJ6 AJ7 AF6 AE7 AF5 AL33 AP33 AN28 AN12 AP8 AL8 AG7 AN25 AE34 AK33 AN33 AN29 AN13 AR8 AM8 AG6 AN26 — MDB0 MDB1 MDB2 MDB3 MDB4 MDB5 MDB6 MDB7 MDB8 MDB9 MDB10 MDB11 MDB12 MDB13 MDB14 MDB15 MDB17 MDB21 MDB19 MDB23 MDB20 MDB16 MDB18 MDB22 MDB25 MDB28 MDB27 MDB30 MDB24 MDB29 MDB26 MDB31 MDB32 MDB33 MDB34 MDB35 MDB36 MDB37 MDB38 MDB39 MDB45 MDB41 MDB47 MDB43 MDB44 MDB40 MDB46 MDB42 MDB52 MDB53 MDB50 MDB55 MDB48 MDB49 MDB54 MDB51 MDB61 MDB60 MDB59 MDB63 MDB56 MDB57 MDB58 MDB62 DQSB0 DQSB1 DQSB2 DQSB3 DQSB4 DQSB5 DQSB6 DQSB7

DDR1_DQS_P0 DDR1_DQS_P1 DDR1_DQS_P2 DDR1_DQS_P3 DDR1_DQS_P4 DDR1_DQS_P5 DDR1_DQS_P6 DDR1_DQS_P7 DDR1_DQS_P8 DDR1_DQS_N0 DDR1_DQS_N1 DDR1_DQS_N2 DDR1_DQS_N3 DDR1_DQS_N4 DDR1_DQS_N5 DDR1_DQS_N6 DDR1_DQS_N7 DDR1_DQS_N8 — -DQSB0 -DQSB1 -DQSB2 -DQSB3 -DQSB4 -DQSB5 -DQSB6 -DQSB7

HASWELL/[10SC1-F01150-01R]

{7} MODT_A[0..3] — MODT_A[0..3]
{8} MODT_B[0..3] — MODT_B[0..3]
{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]

LGA1150
ILM_BP/1156/BKNI/[12KRC-0F0001-61R]

Need check the new CPU ME

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

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Title: CPU LGA1150-B

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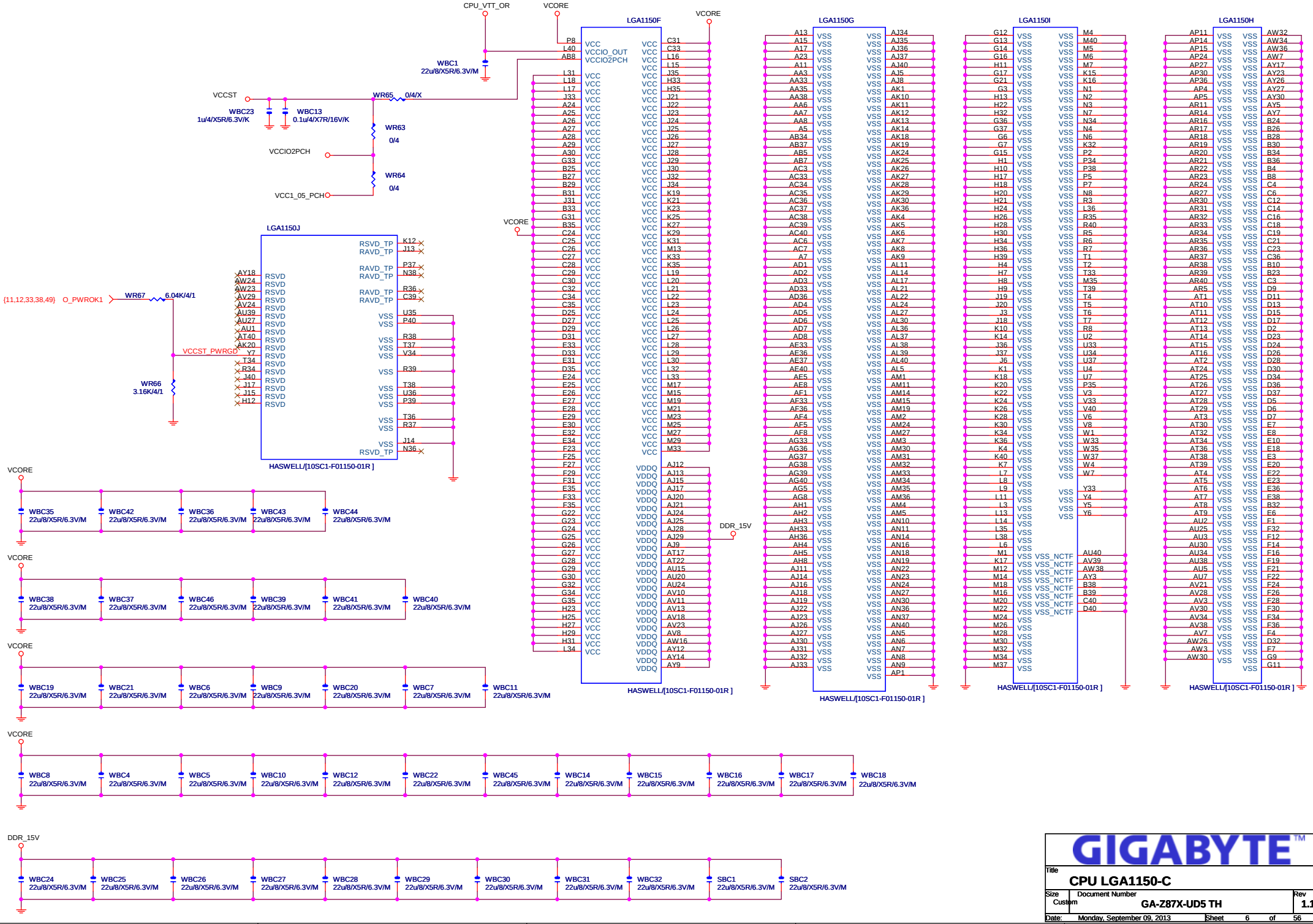

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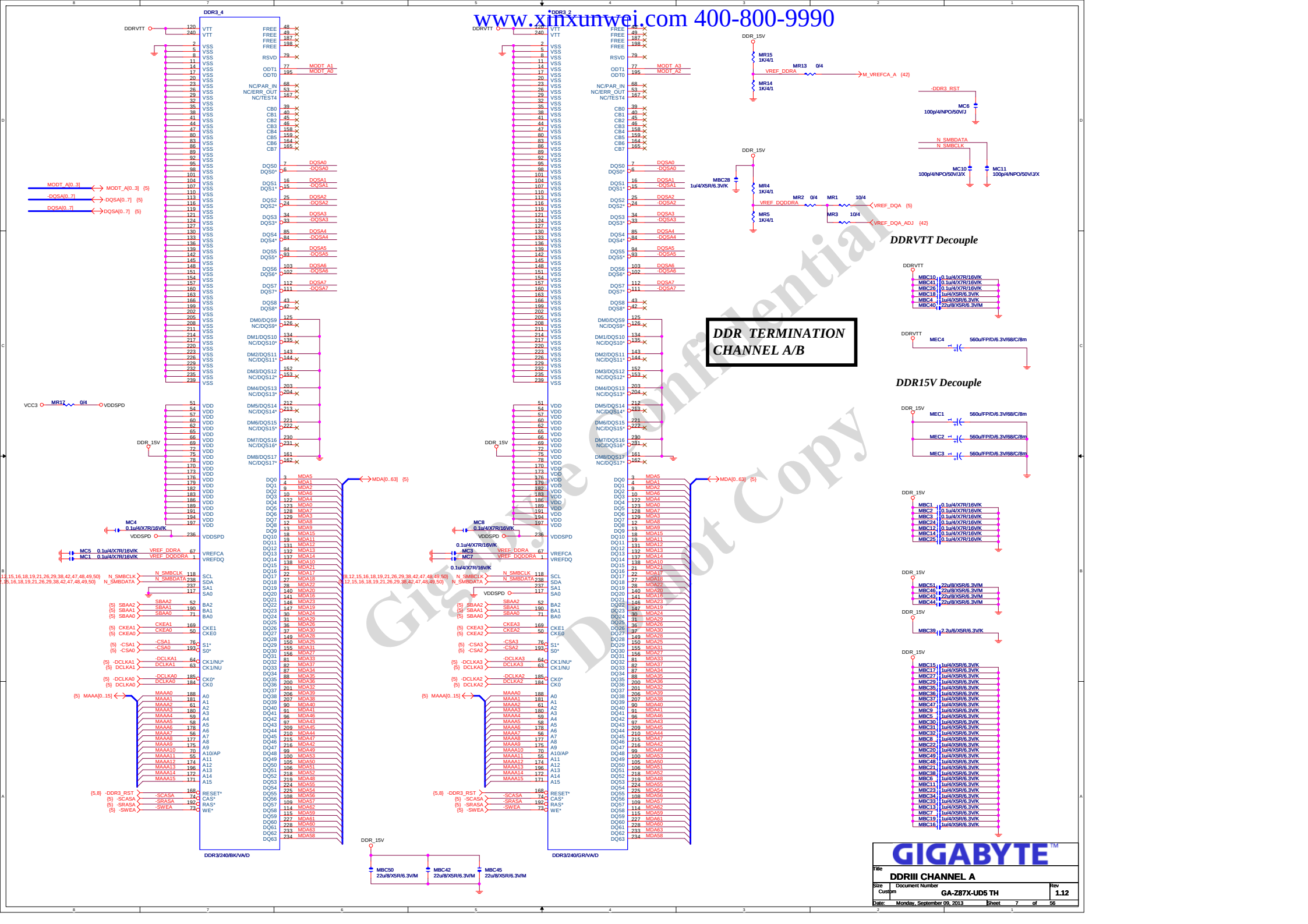
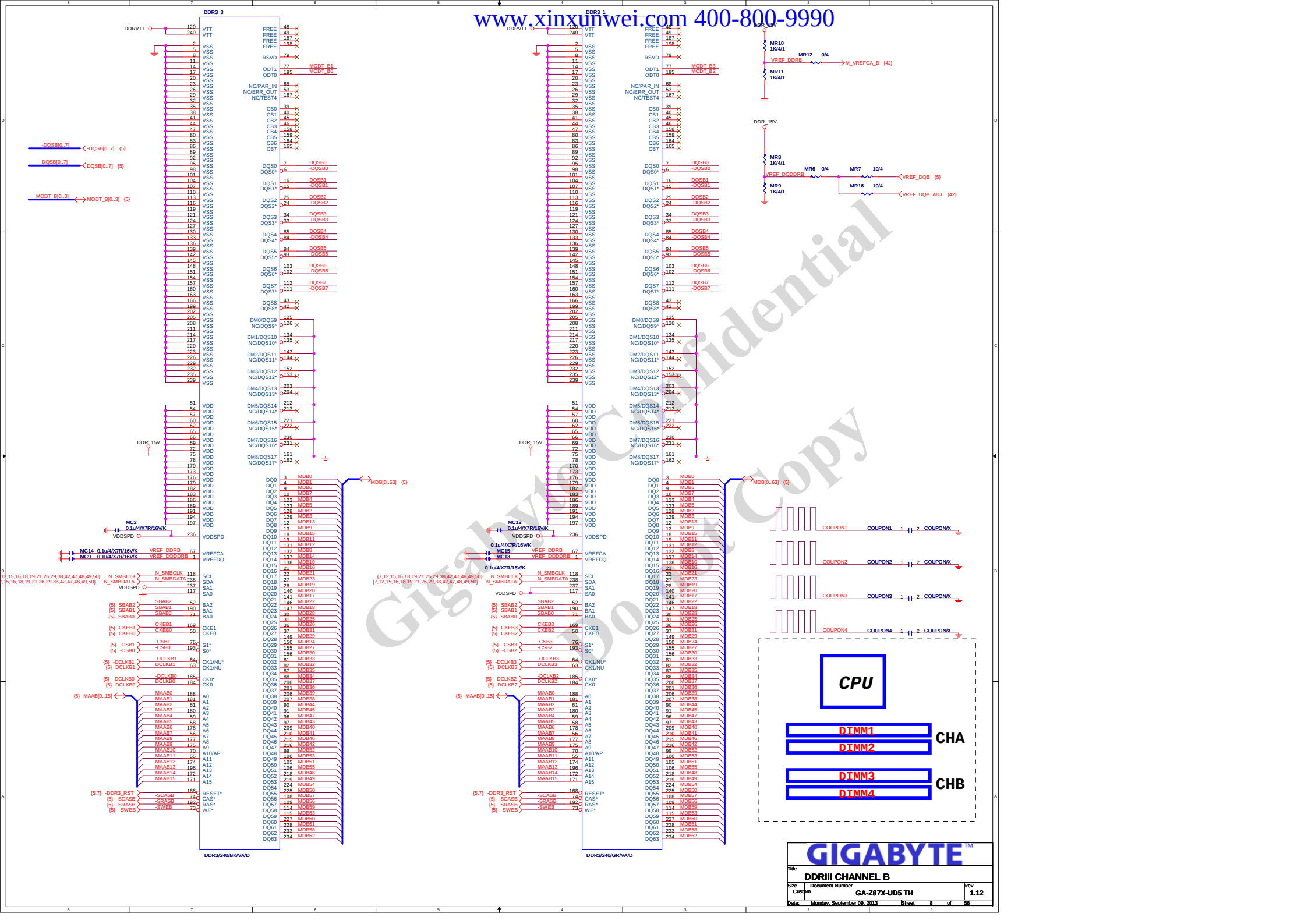
Size: Custom	Document Number: GA-Z87X-UD5 TH	Rev: 1.12
Date: Monday, September 09, 2013	Sheet 6 of 56	



GIGABYTE			
Title: DDRIII CHANNEL A			
Size: Custom	Document Number: GA-Z87X-UD5 TH		Rev: 1.12
Date: Monday, September 09, 2013	Sheet 7 of 56		



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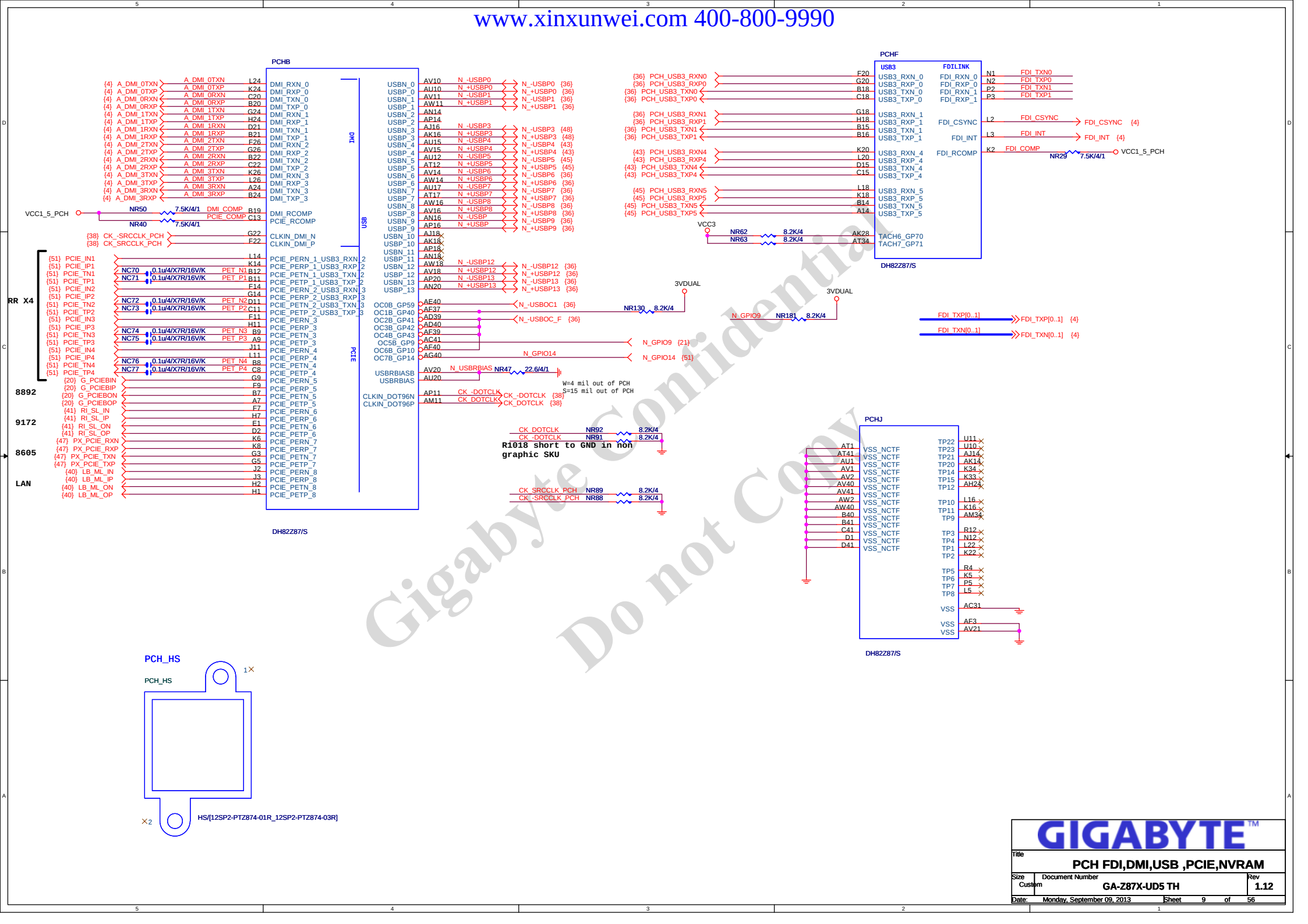
Size: Custom	Document Number: GA-Z87X-UD5 TH	Rev: 1.12
Date: Monday, September 09, 2013	Sheet 8 of 56	



Title	PCH FDI,DMI,USB ,PCIE,NVRAM
Size	Custom
Document Number	GA-Z87X-UD5 TH
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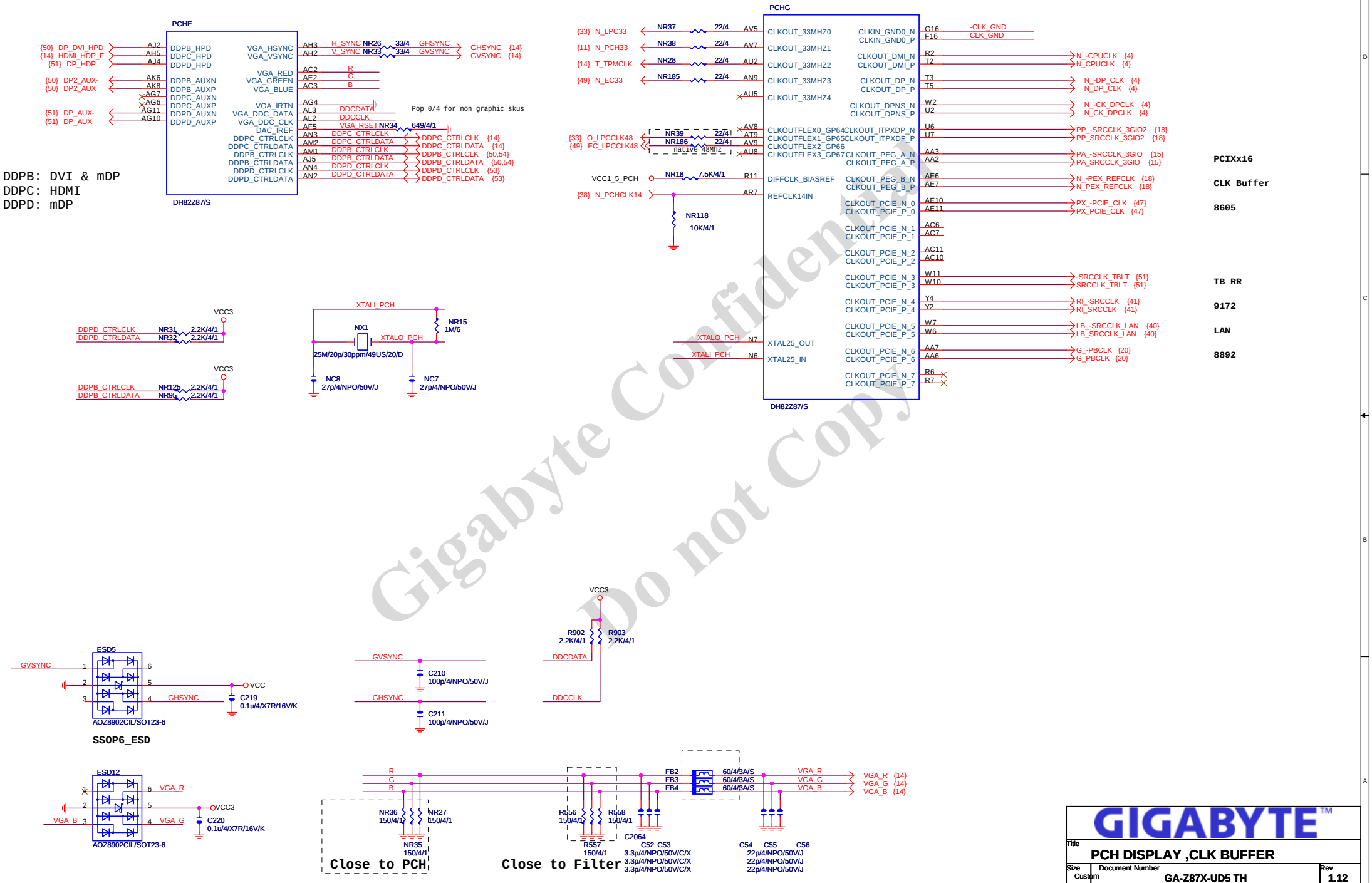
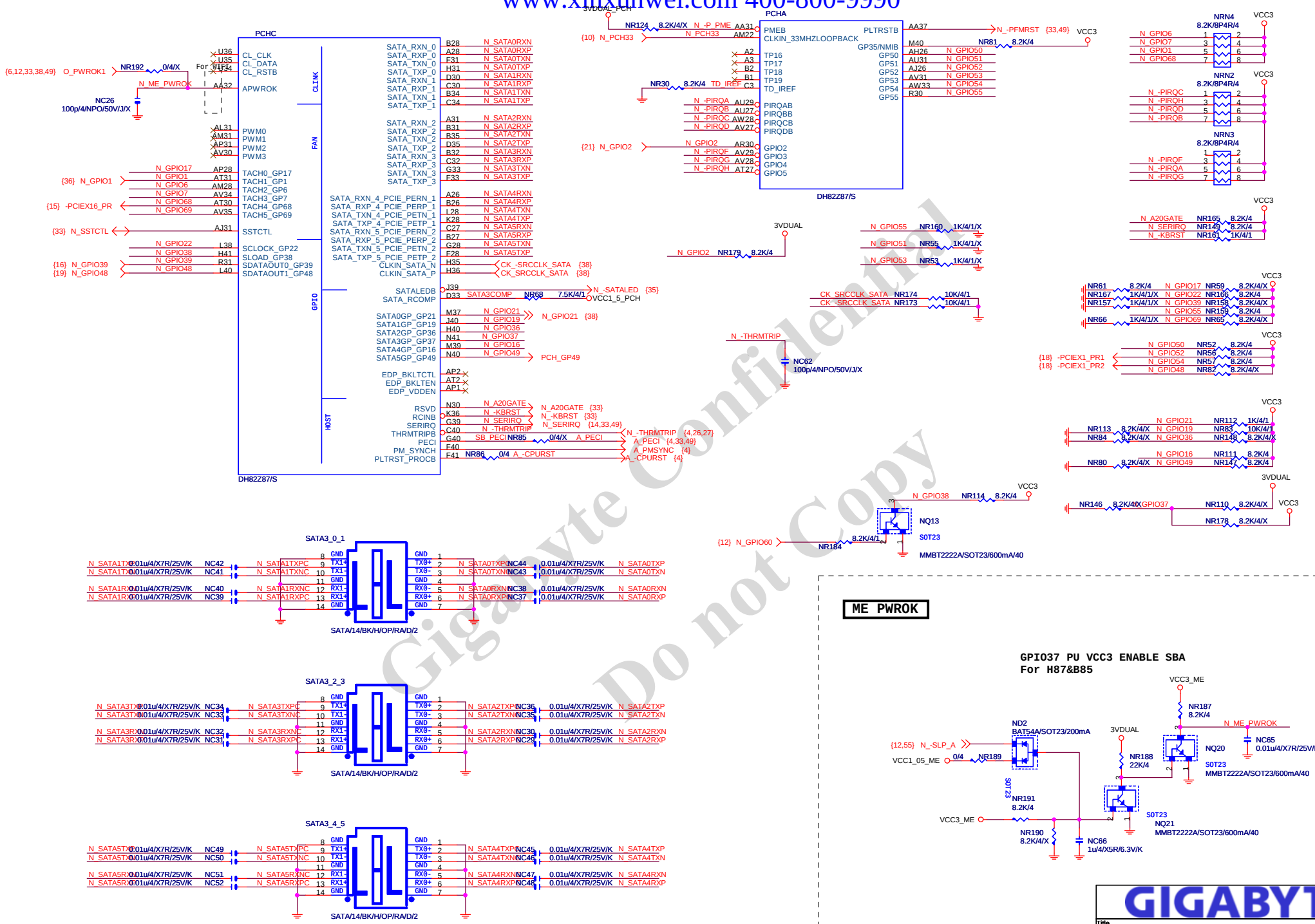
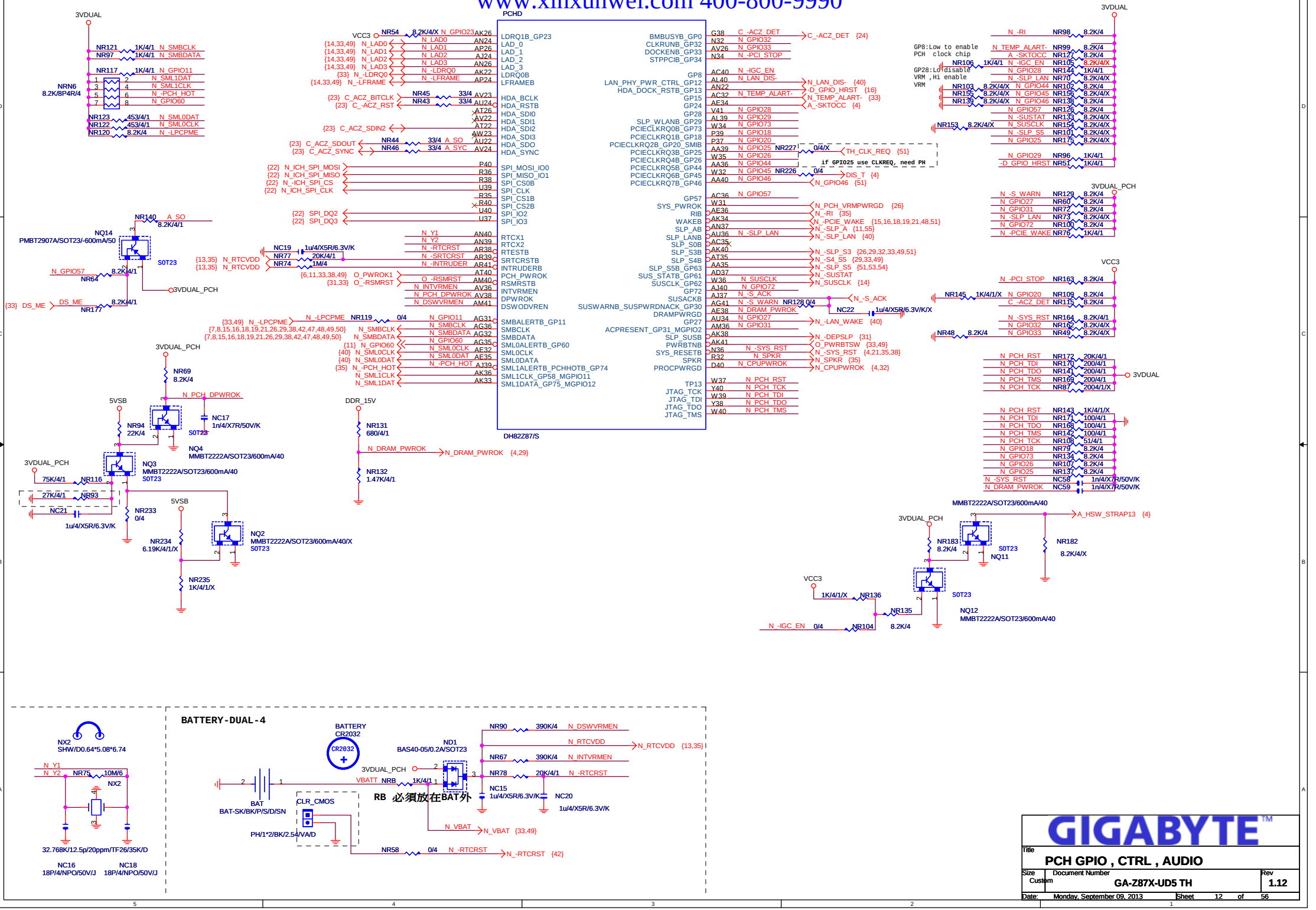
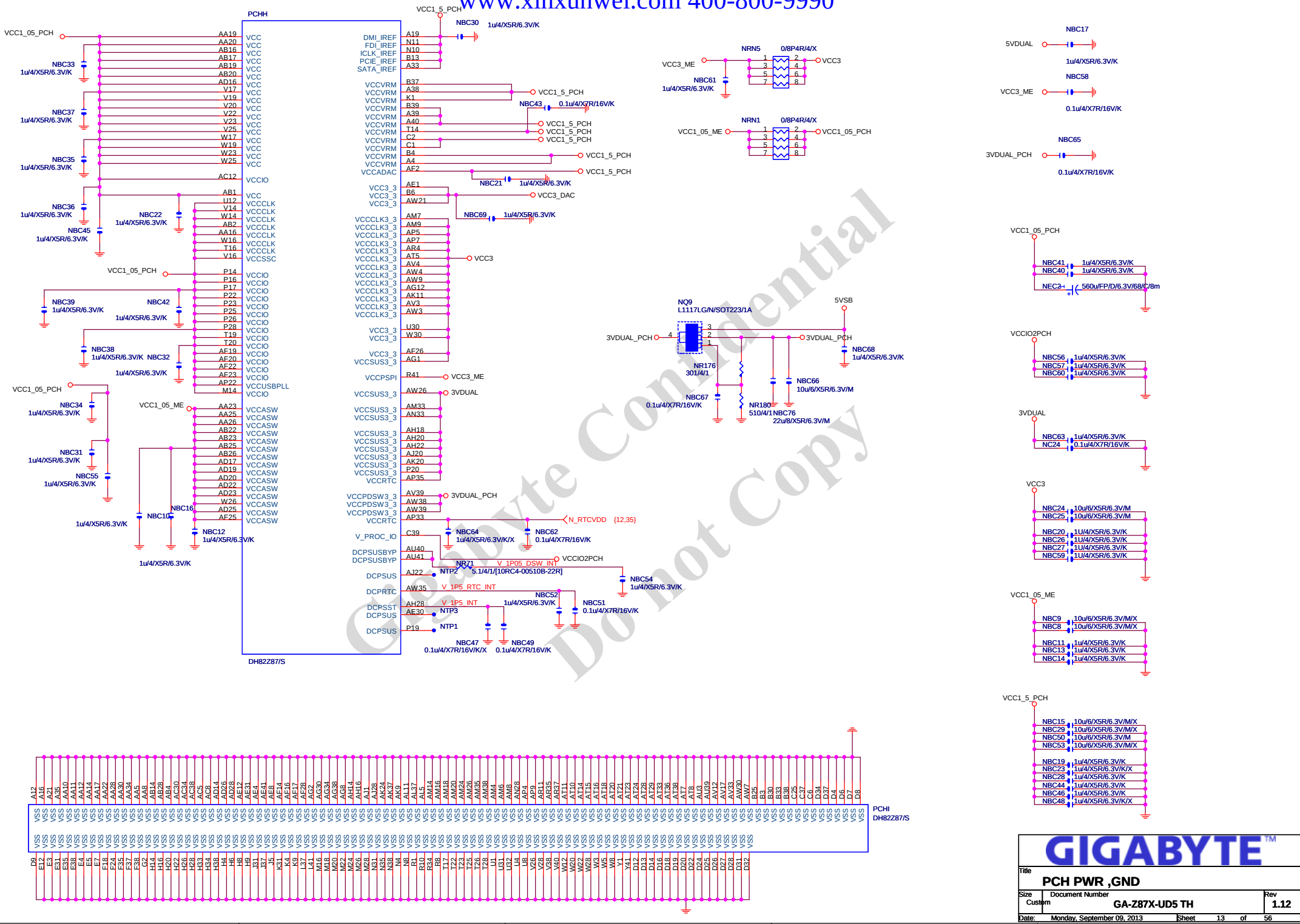
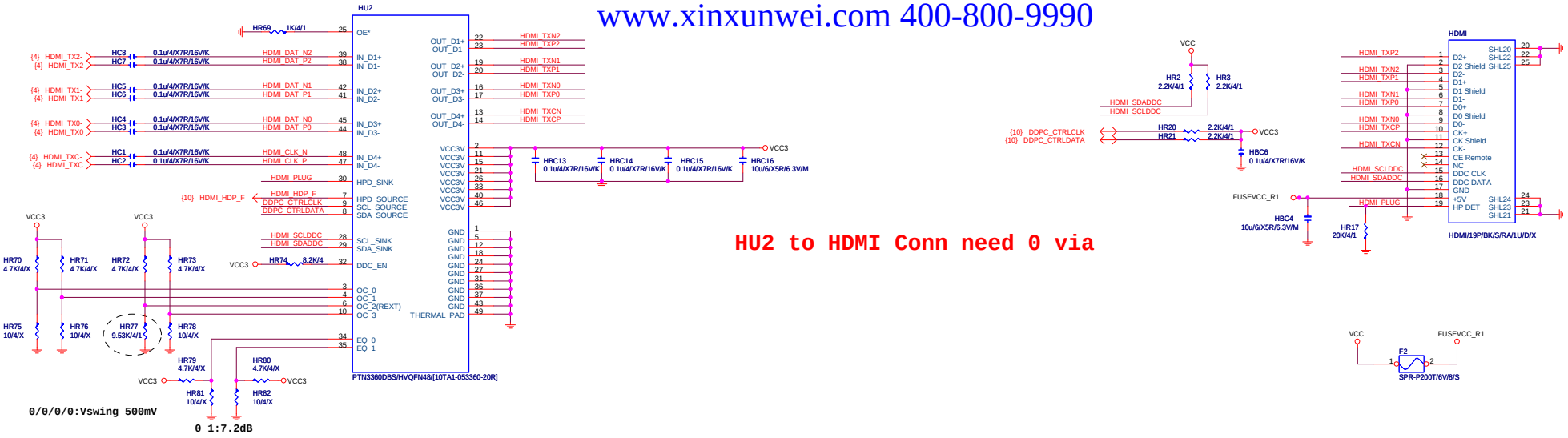


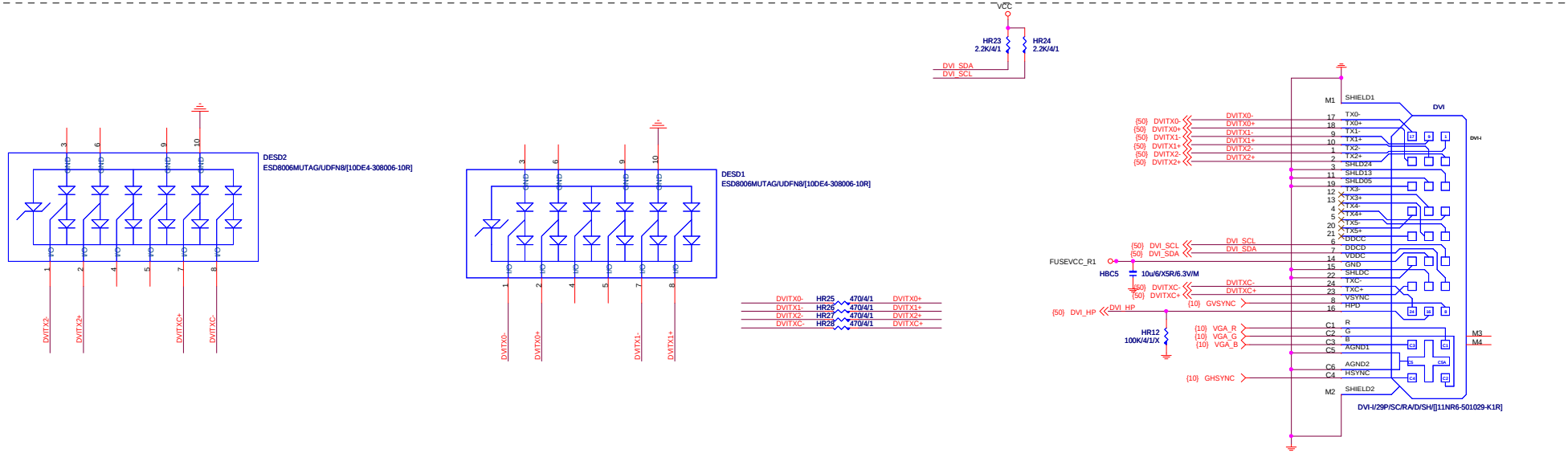
Title	PCH DISPLAY ,CLK BUFFER		
Size: Custom	Document Number: GA-Z87X-UD5 TH		Rev: 1.12
Date: Monday, September 09, 2013	Sheet 10 of 56		

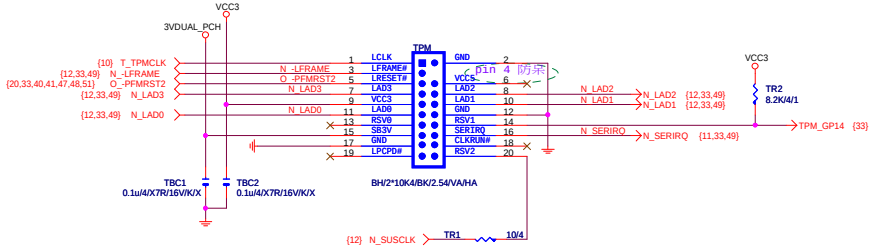












GIGABYTE			
Title: HDMI / DVI/DP			
Size: C	Document Number: GA-Z87X-UD5 TH		Rev: 1.12
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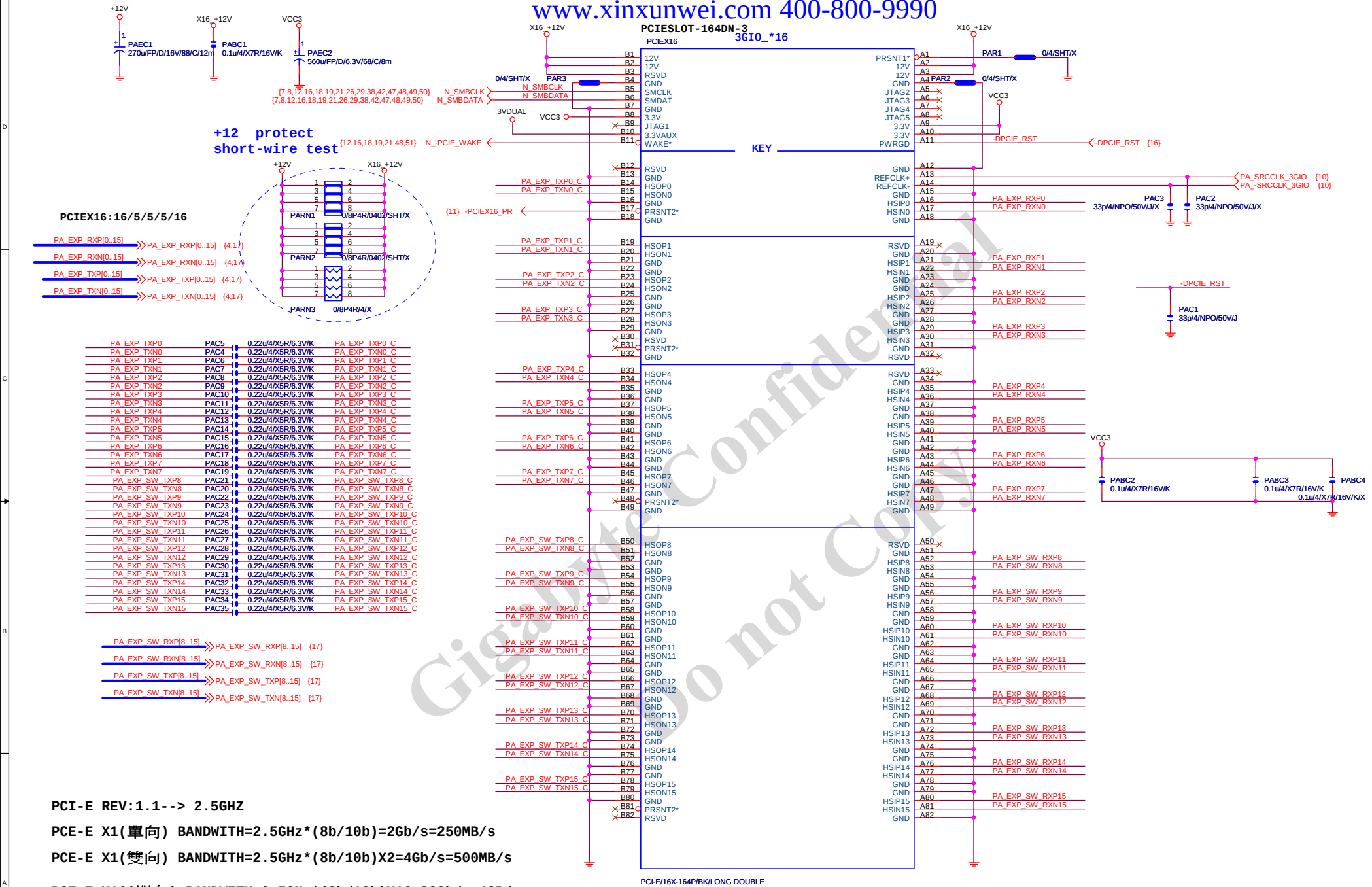

PCI-E REV:1.1--> 2.5GHZ

PCE-E X1(單向) BANDWITH=2.5GHz*(8b/10b)=2Gb/s=250MB/s

PCE-E X1(雙向) BANDWITH=2.5GHz*(8b/10b)X2=4Gb/s=500MB/s

PCE-E X16(單向) BANDWITH=2.5GHz*(8b/10b)X16=32Gb/s=4GB/s

PCE-E X16(雙向) BANDWITH=2.5GHz*(8b/10b)X16X2=64Gb/s=8GB/s

PCI-E REV:2.0--> 5GHZ

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Title	PCI EXPRESS * 16	
Size: Custom	Document Number: GA-Z87X-UD5 TH	Rev: 1.12
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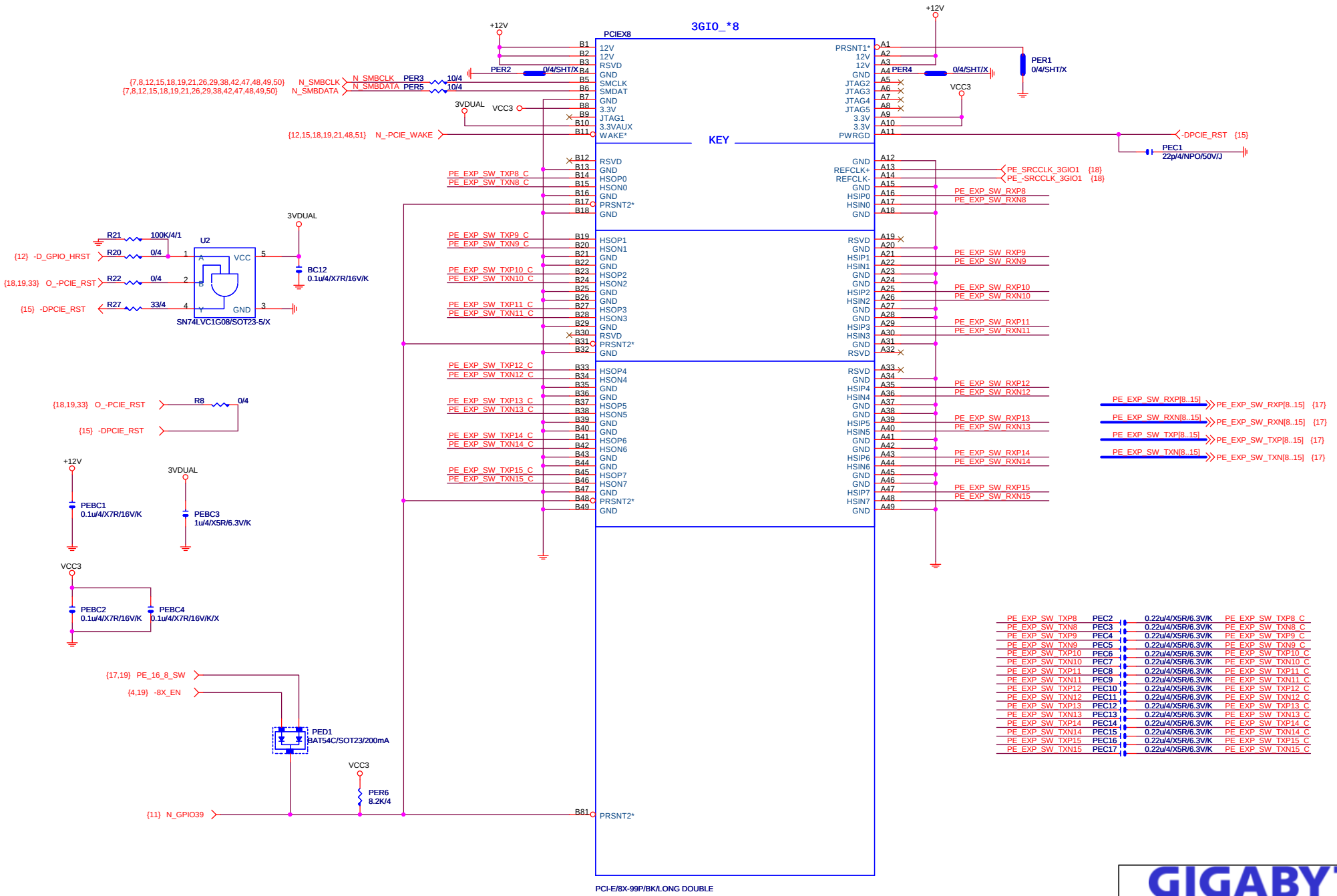

Title	PCI EXPRESS X 8
Size	Custom
Document Number	GA-Z87X-UD5 TH
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Date:	Monday, September 09, 2013
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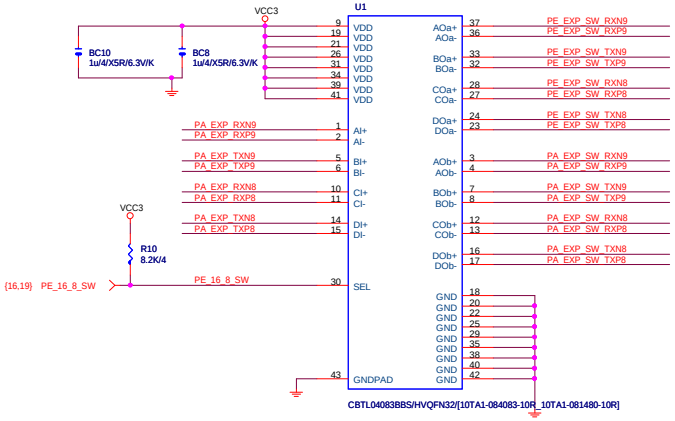
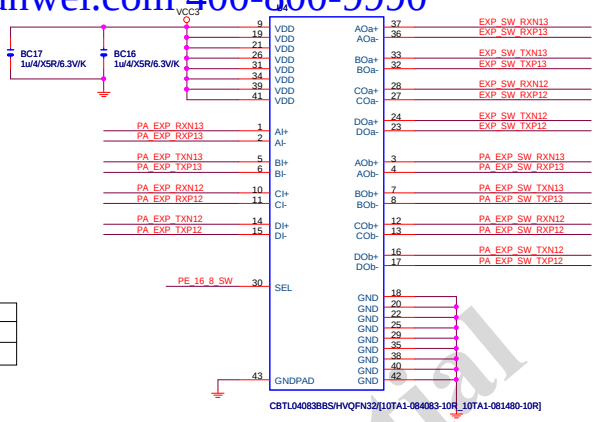
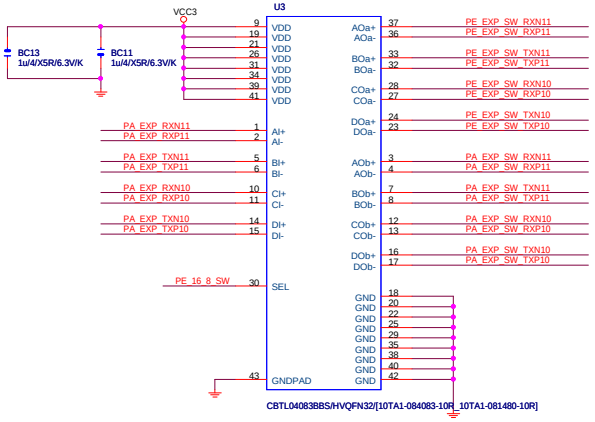
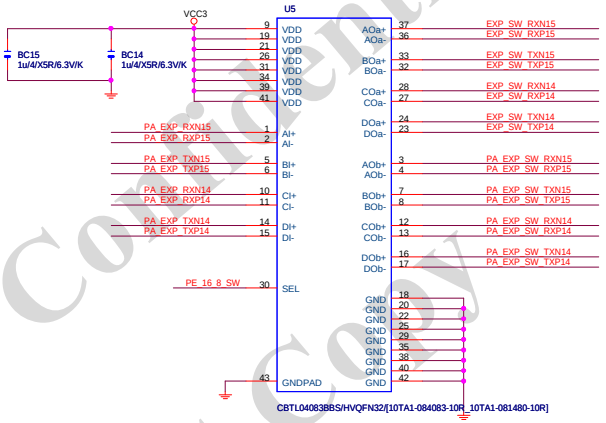


Function	SEL
xI--> xOa	L
xI--> xOb	H



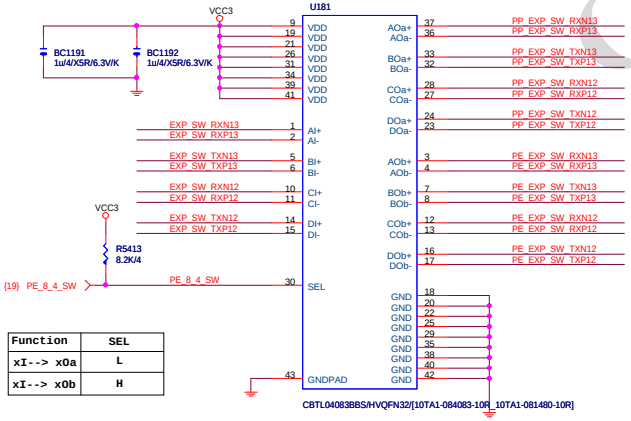




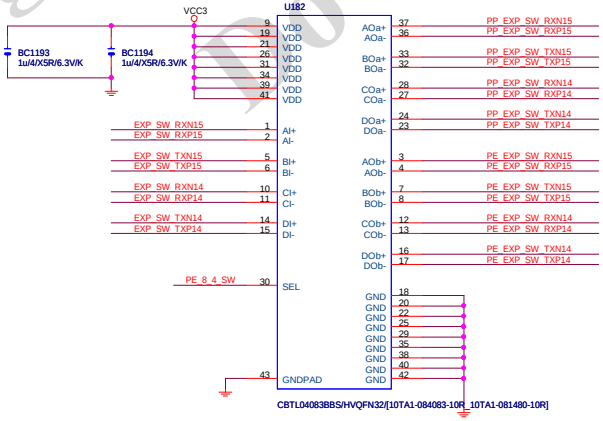
PA_EXP_RXP[0..15] >> PA_EXP_RXP[0..15] {4,15}
PA_EXP_RXN[0..15] >> PA_EXP_RXN[0..15] {4,15}
PA_EXP_TXP[0..15] >> PA_EXP_TXP[0..15] {4,15}
PA_EXP_TXN[0..15] >> PA_EXP_TXN[0..15] {4,15}

PA_EXP_SW_RXP[8..15] >> PA_EXP_SW_RXP[8..15] {15}
PA_EXP_SW_RXN[8..15] >> PA_EXP_SW_RXN[8..15] {15}
PA_EXP_SW_TXP[8..15] >> PA_EXP_SW_TXP[8..15] {15}
PA_EXP_SW_TXN[8..15] >> PA_EXP_SW_TXN[8..15] {15}

PE_EXP_SW_RXP[8..15] >> PE_EXP_SW_RXP[8..15] {16}
PE_EXP_SW_RXN[8..15] >> PE_EXP_SW_RXN[8..15] {16}
PE_EXP_SW_TXP[8..15] >> PE_EXP_SW_TXP[8..15] {16}
PE_EXP_SW_TXN[8..15] >> PE_EXP_SW_TXN[8..15] {16}



Function	SEL
xI--> xOa	L
xI--> xOb	H



PP_EXP_SW_RXP[12..15] >> PP_EXP_SW_RXP[12..15] {19}
PP_EXP_SW_RXN[12..15] >> PP_EXP_SW_RXN[12..15] {19}
PP_EXP_SW_TXP[12..15] >> PP_EXP_SW_TXP[12..15] {19}
PP_EXP_SW_TXN[12..15] >> PP_EXP_SW_TXN[12..15] {19}

Gigabyte Technology		
Title: PCI_E SWITCH		
Size: C	Document Number: GA-Z87X-UD5 TH	Rev: 1.12
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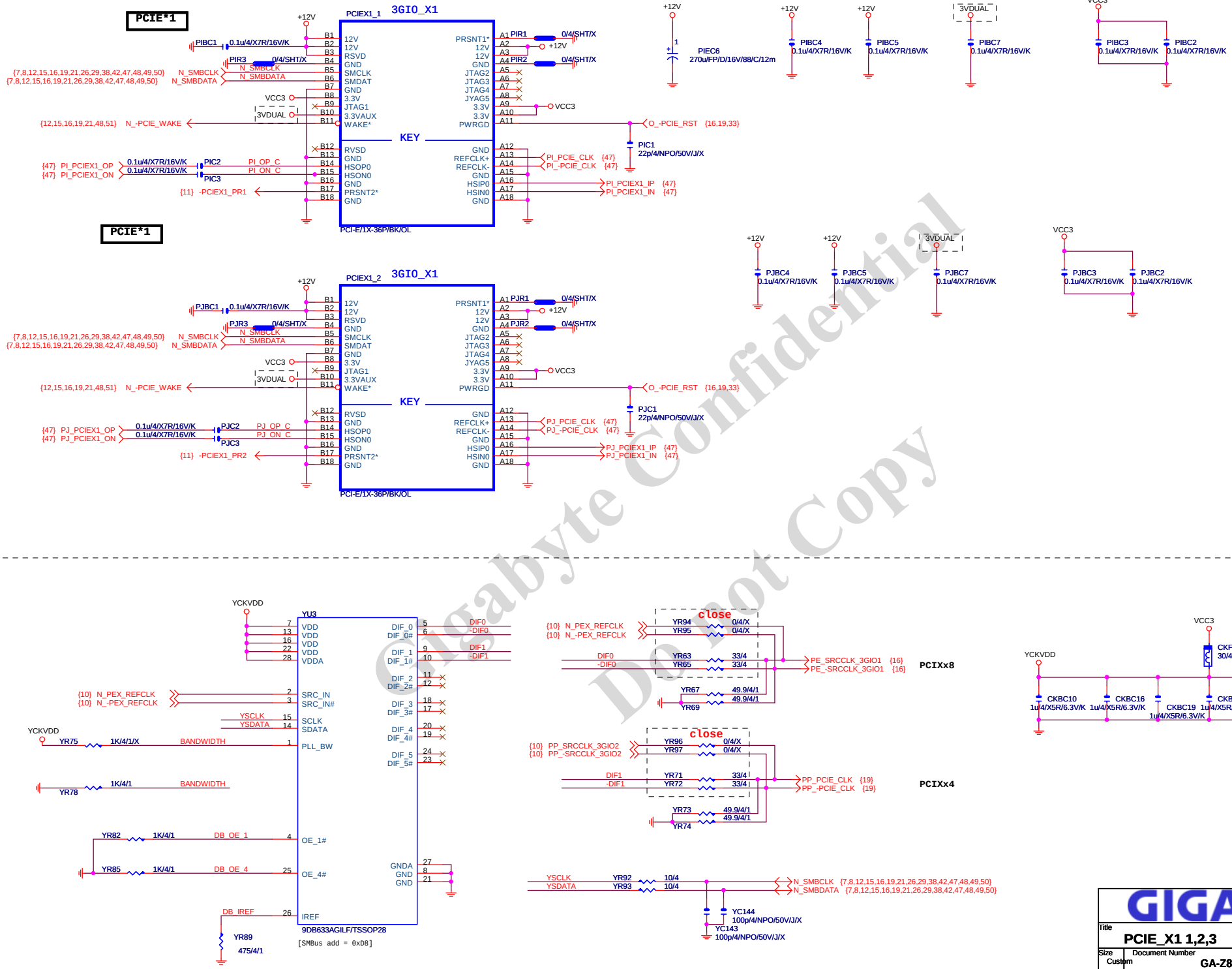

PCIE*4

PCIEX4

3GIO_*4

KEY

PCI-E/4X-65P/BK/LONG DOUBLE

LOW : disable PCIEx4 slot

Title	PCIE_X4
Size	Custom
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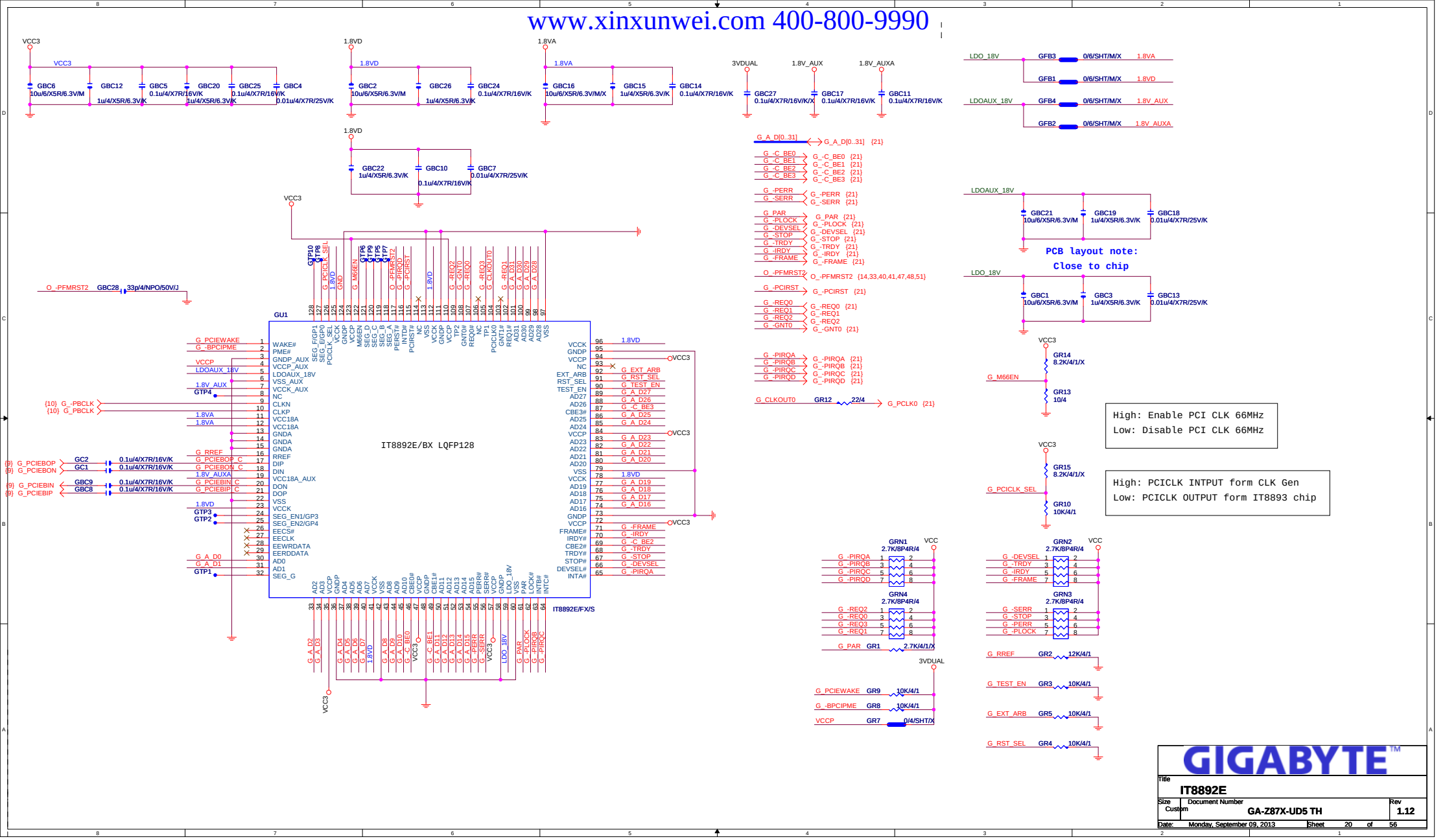
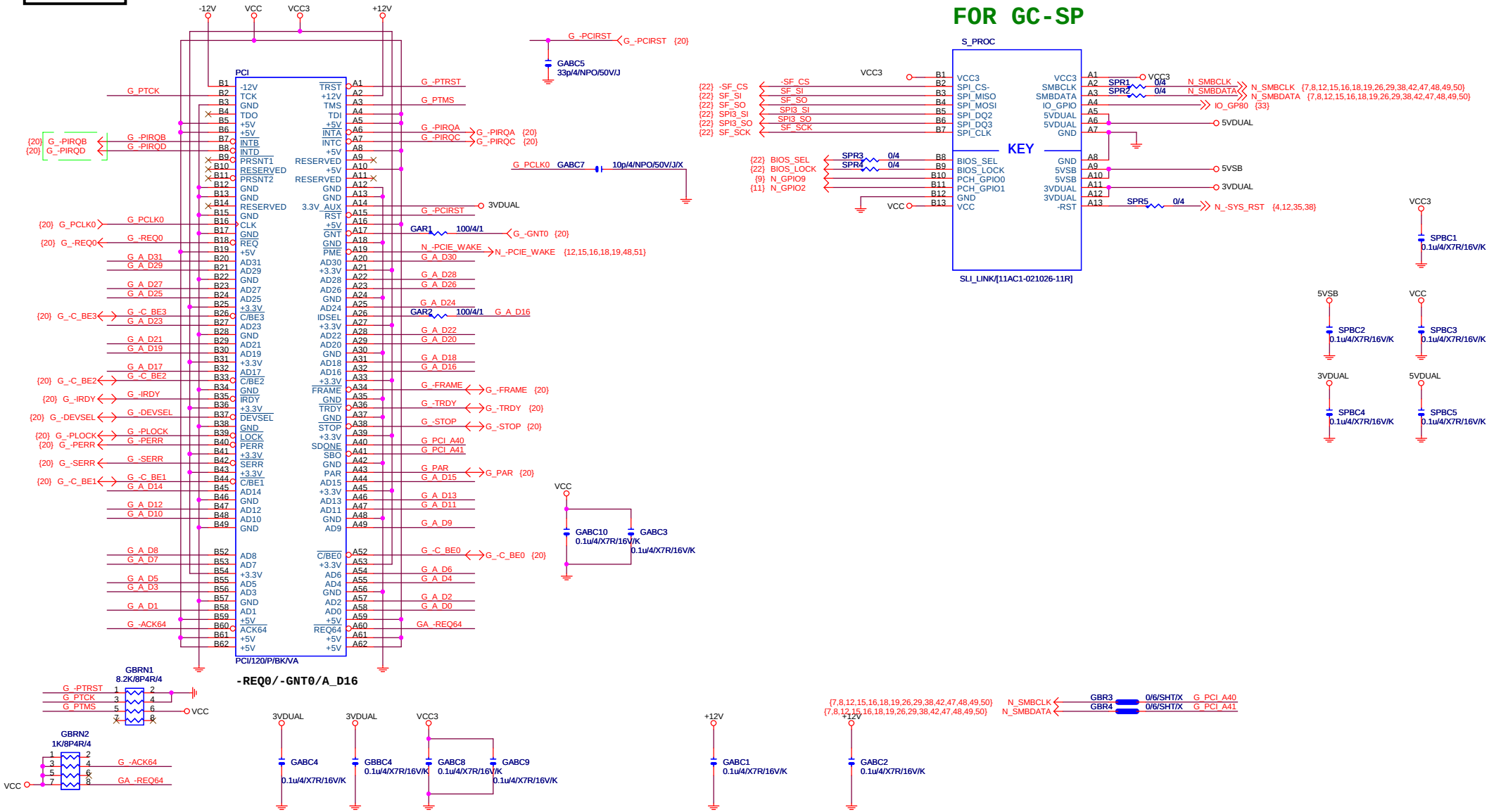


PCI SLOT 1

FOR GC-SP



Title		
PCI SLOT 1		
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指定用DII

VCC3_ME
MMBT2222A/SOT23/600mA/40/[10IT1-002222-11R]
R231 330/4
Q62
R232 1K/4/1
R233 0/4/X
-SPI_CS_1_PCH
S0T23
N_-ICH_SPI_CS
CS
PH/1*2/BK/2.54/VA/D
Q57
MMBT2222A/SOT23/600mA/40/[10IT1-002222-11R]
S0T23
-SPI_HOLD_B R234 8.2K/4 LOCK_M

指定用DII

VCC3_ME
R235 330/4
-SPI_CS_2
R236 1K/4/1
Q58
MMBT2222A/SOT23/600mA/40/[10IT1-002222-11R]
S0T23
LOCK_B
N_-ICH_SPI_CS
Q59
MMBT2222A/SOT23/600mA/40/[10IT1-002222-11R]
S0T23
-SPI_HOLD_M R229 8.2K/4

M_BIOS
-SPI_CS_1 NR4 22/4
NC4 10p/4NPO/50V/J/X
SPI_MISO
{12} SPI_DQ2 R24 0/4/X -SPI_WP0
CS# VDD
SO HOLD#
WP# SCK
VSS SI
-HOLD0 R141 -SPI_HOLD_M 8.2K/4/1/X
SPI_CLK
SPI_MOSI
NC3 10p/4NPO/50V/J/X
MAIN BIOS
128M/Q/SPI/SO8/S/[10HP4-112512-20R]

VCC3_F
NR3 0/4/SHT/M/X
NBC3 1u/4/X5R/6.3V/K

B_BIOS
-SPI_CS_2 R230 22/4
SPI_MISO
{12} SPI_DQ2 R143 0/4 -SPI_WP1
CS# VDD
SO HOLD#
WP# SCK
VSS SI
R28 8.2K/4/1/X R142 0/4 -SPI_HOLD_B SPI_DQ3 {12}
SPI_CLK
SPI_MOSI
BACKUP BIOS
128M/Q/SPI/SO8/S/[10HP4-112512-20R]

VCC3_F
NR6 0/4/SHT/M/X
NBC2 1u/4/X5R/6.3V/K
{12} SPI_DQ2 R271 0/4 N_-SPI_WP0_PCH

MOSI For DMI RX Termination Voltage

VCC3_ME
{12} N_ICH_SPI_MOSI N_ICH_SPI_MOSI NR1 8.2K/4/1/X
{12} N_-ICH_SPI_CS N_-ICH_SPI_CS NR8 8.2K/4/1/X
-SPI_HOLD0 NR16 8.2K/4/1/X
-SPI_HOLD1 NR17 8.2K/4/1/X

VCC3_ME
-SPI_WP1 NR10 8.2K/4/1/X
-SPI_WP0 NR2 8.2K/4/1/X
{12} N_ICH_SPI_MISO N_ICH_SPI_MISO NR9 8.2K/4/1

VCC3_ME
-SPI_HOLD_B R98 1K/4/1
-SPI_HOLD_M R144 1K/4/1

1 means floating
0 means PD 1K

SPI_MISO_PCH NR7 22/4 N_ICH_SPI_MISO {12}
-HOLD0_PCH R272 0/4 SPI_DQ3 {12}

VCC3_F NBC1 0.1u/4/X7R/16V/K
VCC3_ME C13 0.1u/4/X7R/16V/K

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

FOR GC-SP

VCC
R29 680/6
MBIOS_LED
LED/O/6/S
藍
Q78 2N7002/SOT23/25pF/5
-SPI_HOLD_M R94 8.2K/4/1

VCC
R145 680/6
BBIOS_LED
LED/O/6/S
藍
Q79 2N7002/SOT23/25pF/5
-SPI_HOLD_B R115 8.2K/4/1

FOR GC-SP

LOCK_M SPR11 0/4/X
LOCK_B
SPD1 BAT54C/SOT23/200mA
BIOS_LOCK {21}

5VDUAL
R117 1K/4/1
{33} B_SW
BIOS_SW
SLIDE SW/1 P/BK/D/[11NH7-110003-21R]

-SPI_HOLD_M
R109 8.2K/4/1
Q80 MMBT2222A/SOT23/600mA/40 S0T23
-SPI_HOLD0 {33}

-SPI_HOLD_B
R161 8.2K/4/1
Q81 MMBT2222A/SOT23/600mA/40 S0T23
-SPI_HOLD1 {33}

5VDUAL
R164 1K/4/1
R165 1K/4/1
-SPI_HOLD_M
R167 8.2K/4/1
Q82 MMBT2222A/SOT23/600mA/40 S0T23
-SPI_HOLD1 {33}
Q84 2N7002/SOT23/25pF/5

-SPI_HOLD_B
R163 8.2K/4/1
Q83 MMBT2222A/SOT23/600mA/40 S0T23
-SPI_HOLD0 {33}

R237 100/4/1 -DUAL_BIOSDIS {33}
SB
SLIDE SW/1 P/BK/D/[11NH7-110003-21R]

1	Disable
2	Enable

FOR GC-SP

VCC3_F
SPR6 8.2K/4
SPBC6 0.1u/4/X7R/16V/K
{21} BIOS_SEL
SPU1
-SPI_CS_1 -SPI_CS_1_PCH
-SPI_WP0 N_-SPI_WP0_PCH
PI3USB102ZLE/TQFN10
-SF_CS {21}
SPI3_SI {21}

VCC3_F
SPR7 8.2K/4
SPBC7 0.1u/4/X7R/16V/K
{21} BIOS_SEL
SPU2
SPI_MISO SPI_MISO_PCH
SPI_MOSI N_ICH_SPI_MOSI {12}
PI3USB102ZLE/TQFN10
SF_SI {21}
SF_SO {21}

VCC3_F
SPR8 8.2K/4
SPBC8 0.1u/4/X7R/16V/K
{21} BIOS_SEL
SPU3
SPI_CLK N_ICH_SPI_CLK {12}
-HOLD0 -HOLD0_PCH
PI3USB102ZLE/TQFN10
SF_SCK {21}
SPI3_SO {21}

VCC3_F VCC3_ME 3VDUAL_PCH
SPR9 0/4/X
SPR10 0/4

-SPI_HOLD0 -SPI_HOLD0 {33}
-SPI_HOLD1 -SPI_HOLD1 {33}

GIGABYTE™

Title: DUAL BIOS, TPM

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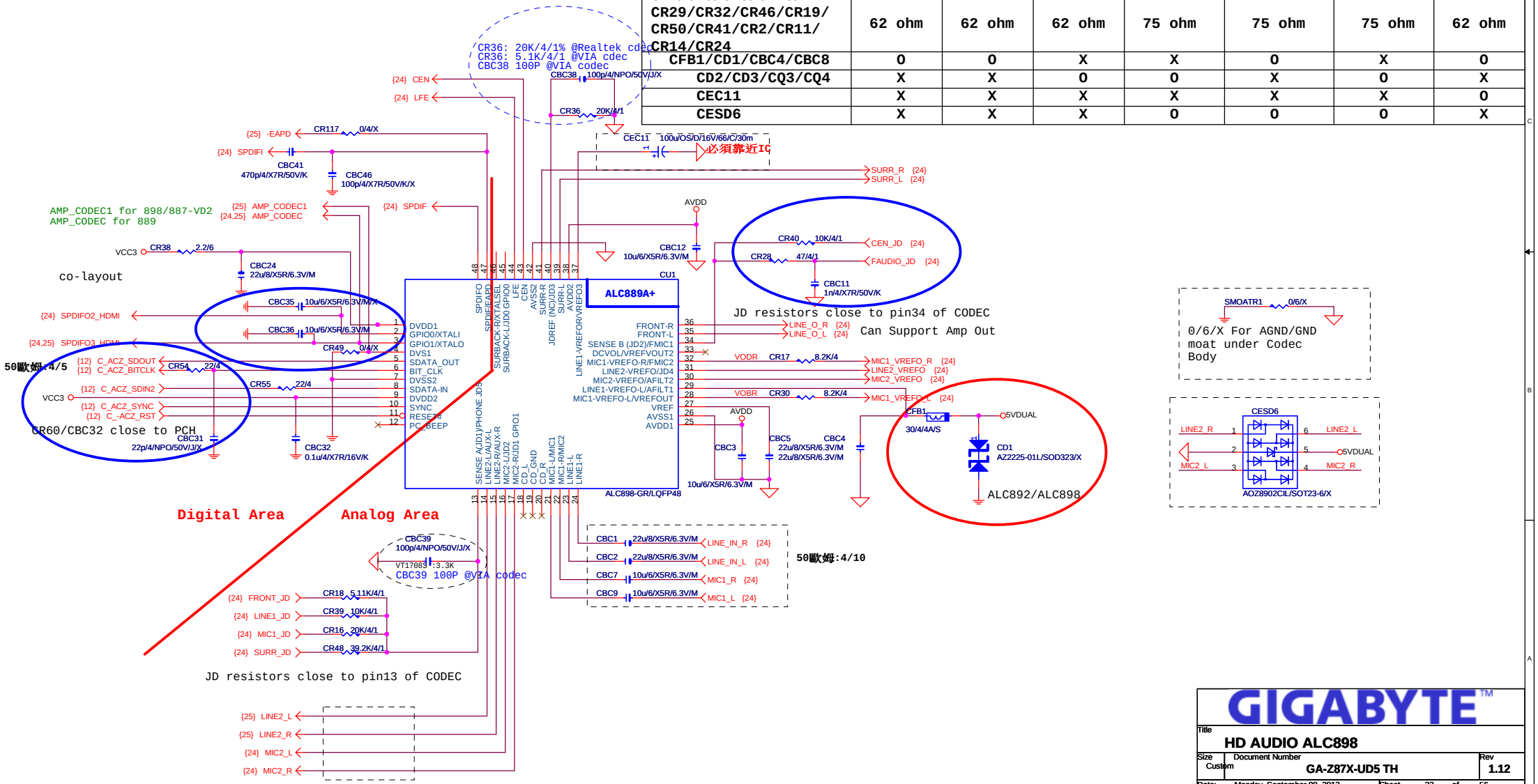
AZALIA CODEC : ALC662/ALC887-VD2/ALC889/VT1708S-CD/VT1708S-CE/VT2021 Colay

	ALC662	ALC887-VD2	ALC889	VT1708S-CD	VT1708S-CE	VT2021	ALC898/ALC892
CR49	X	X	0	0	X	0	X
CBC36	0	0	X	X	0	X	0
CR28/CBC11	47ohm+1nF	47ohm+1nF	47ohm+1nF	22ohm+100P	22ohm+100P	47ohm+1nF	47ohm+1nF
CR52	X	0	0	0	0	0	0
CR57	0	X	X	X	X	X	X
CBC1/CBC2	10uF/X5R	10uF/X5R	22uF/X5R	10uF/X5R	10uF/X5R	10uF/X5R	22uF/X5R
CR36	20K/4/1	20K/4/1	20K/4/1	5.1K/4/1	20K/4/1	5.1K/4/1	20K/4/1
CR17/CR30/ CR25/CR15/CR12/CR3/	8.2K/4	8.2K/4	8.2K/4	3.3K/4/1	3.3K/4/1	3.3K/4/1	8.2K/4
CBC38/CBC39	X	X	X	100P/4	100P/4	X	X
CR10/CR8/CR20/CR45/ CR42/CR51/CR27/CR26	22K/4	22K/4	22K/4	10K/4/1	10K/4/1	10K/4/1	22K/4
CR7/CR9/CR5/CR13/ CR29/CR32/CR46/CR19/ CR50/CR41/CR2/CR11/ CR14/CR24	62 ohm	62 ohm	62 ohm	75 ohm	75 ohm	75 ohm	62 ohm
CFB1/CD1/CBC4/CBC8	0	0	X	X	0	X	0
CD2/CD3/CQ3/CQ4	X	X	0	0	X	0	X
CEC11	X	X	X	X	X	X	0
CESD6	X	X	X	0	0	0	X



GIGABYTE

Title: HD AUDIO ALC898

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CR44 0/6 → Audio jack --> USB

MOATC1 0/4 → Near Audio jack left

MOATC2 0/4 → Codec --> Audio jack

MOATC3 0.1u/4/X7R/16V/K → F_AUDIO

CR4 0/6/SHT/X

VCC3

CR104 8.2K/4/X

{23} SPDIFI

CR105 374K/4/1/X

5VDUAL

CR103 0/4

SPDIF_IN

PH/1*3/BK/2.54/VA/D

{23,25} SPDIFO3_HDMI — CR53 0/4/X

{23} SPDIFO2_HDMI — CR52 0/4

{23} SPDIF — CR57 0/4/X

SPDIFO_HDMI

CBC37 100p/4/NPO/50V/J

PIN

SPDIF_O

PH/1*2/BK/2.54/VA/D

For HDMI SPDIF

AZALIA JACK

BTX AZALIA CONNECTOR

11NR6-403025-61R

AUDIOB

{23} LINE1_JD — LINE1_JD — AJ_A5 — AJ_A2 — GND REAR

BLUE LINE-IN

{23} FRONT_JD — FRONT_JD — AJ_B5 — AJ_B2 — GND CEN/LFE

GREEN LINE-OUT

{23} MIC1_JD — MIC1_JD — AJ_C5 — AJ_C2 — GND SIDE

PINK MIC-IN

2X3RP/25P/BU,GE,OR,BK,GY/RA/[11NR6-403025-61R]

AUDIOA

{23} CEN_JD — CEN_JD — BJ_B5 — BJ_B2 — GND LINE-IN

Orange CEN/LFE

{23} SURR_JD — SURR_JD — BJ_C5 — BJ_C2 — GND LINE-OUT

Black SURROUND

{23} SPDIF — FUSEVCC_R2 — SPDIF VCC GND — OPTICAL

Gray SPDIFIN

2X3RP/25P/BU,GE,OR,BK,GY/RA/[11NR6-403025-61R]

LINE-OUT

CR10 22K/4

CR8 22K/4

CEC2 100u/FP/D/6.3V/65/C/13m

{23} LINE_O_R — CR7 62/4 — AJ_B5

CEC3 100u/FP/D/6.3V/65/C/13m

{23} LINE_O_L — CR9 62/4 — AJ_B2

CBC23 180p/4/NPO/50V/J

CBC26 180p/4/NPO/50V/J

LINE-IN

{23} LINE_IN_R — CR5 62/4 — AJ_A5

{23} LINE_IN_L — CR13 62/4 — AJ_A2

CBC18 180p/4/NPO/50V/J

CBC27 180p/4/NPO/50V/J

MIC-IN

{23} MIC1_R — CR29 62/4 — AJ_C5

{23} MIC1_L — CR32 62/4 — AJ_C2

{23} MIC1_VREFO_L

{23} MIC1_VREFO_R

CBC19 180p/4/NPO/50V/J

CBC22 180p/4/NPO/50V/J

SURROUND

CR20 22K/4

CR45 22K/4

CEC5 100u/FP/D/6.3V/65/C/13m

{23} SURR_R — CR46 62/4 — BJ_C5

CEC7 100u/FP/D/6.3V/65/C/13m

{23} SURR_L — CR19 62/4 — BJ_C2

EMI

CBC29 180p/4/NPO/50V/J

CBC28 180p/4/NPO/50V/J

CEN/LFE

CR42 22K/4

CR51 22K/4

CEC9 100u/FP/D/6.3V/65/C/13m

{23} LFE — CR50 62/4 — BJ_B5

CEC10 100u/FP/D/6.3V/65/C/13m

{23} CEN — CR41 62/4 — BJ_B2

EMI

CBC25 180p/4/NPO/50V/J

CBC34 180p/4/NPO/50V/J

SURR BACK

AZALIA FRONT PANEL

CQ2 BAT54A/SOT23/200mA

{23} LINE2_VREFO — CR25 8.2K/4/1/X — CR15 8.2K/4/1/X

CQ1 BAT54A/SOT23/200mA

{23} MIC2_VREFO — CR12 8.2K/4/1 — CR3 8.2K/4/1

EMI

{23} MIC2_L — CBC20 10u/6/X5R/6.3V/M — CR2 62/4 — M2_L

{23} MIC2_R — CBC15 10u/6/X5R/6.3V/M — CR11 62/4 — M2_R

{25} LINE2_OUT_R — CR33 62/4 — L2-R

{23} FAUDIO_JD

{25} LINE2_OUT_L — CR34 62/4 — L2-L

CR27 22K/4

CR26 22K/4

F_AUDIO

CR1 0/4/X

CBC10 180p/4/NPO/50V/J

CBC16 180p/4/NPO/50V/J

CBC17 180p/4/NPO/50V/J

CBC6 180p/4/NPO/50V/J

Digital Area

3VDUAL

CR56 8.2K/4/X

C_-ACZ_DET {12}

CR35 20K/4/1

CR31 39.2K/4/1

BH/2*5K8/BK/2.54/VA/AUDIO/PRT/TUR180/[11NH3-001205-31R]

GIGABYTE™

Title: AUDIO JACK

Size: Custom | Document Number: GA-Z87X-UD5 TH | Rev: 1.12

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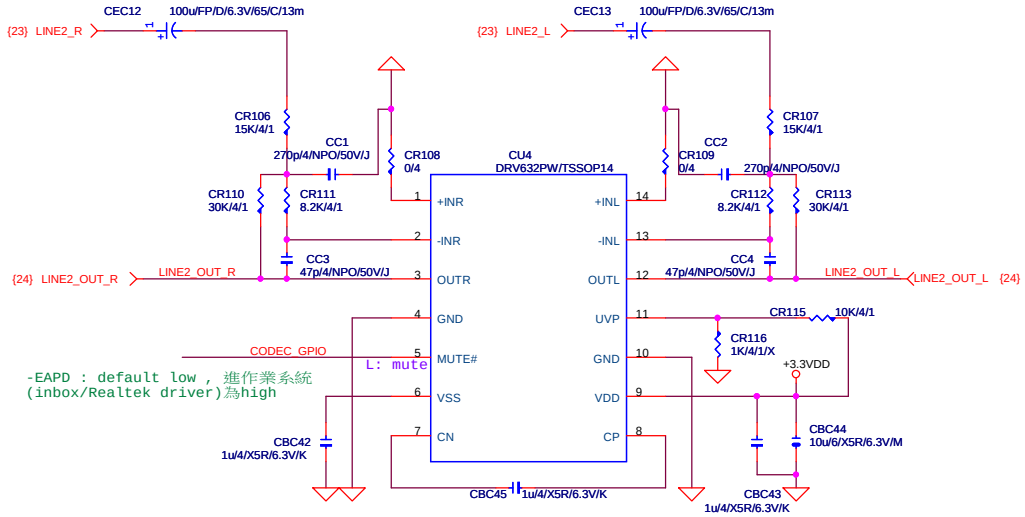
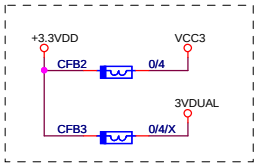
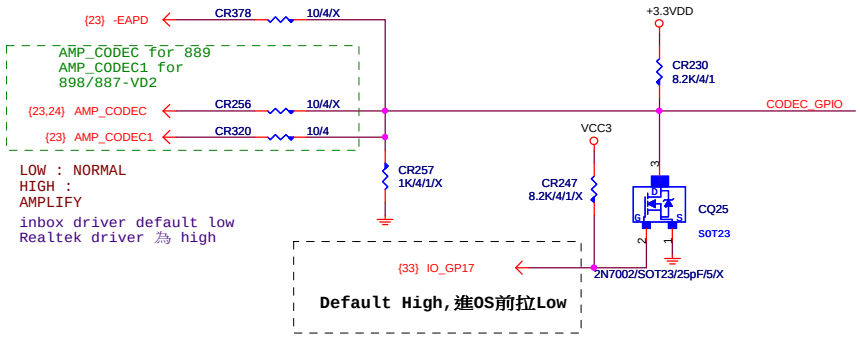
HEADPHONE







GIGABYTE™

Title: **Audio Amplifier**		
Size: Custom	Document Number: **GA-Z87X-UD5 TH**	Rev: **1.12**
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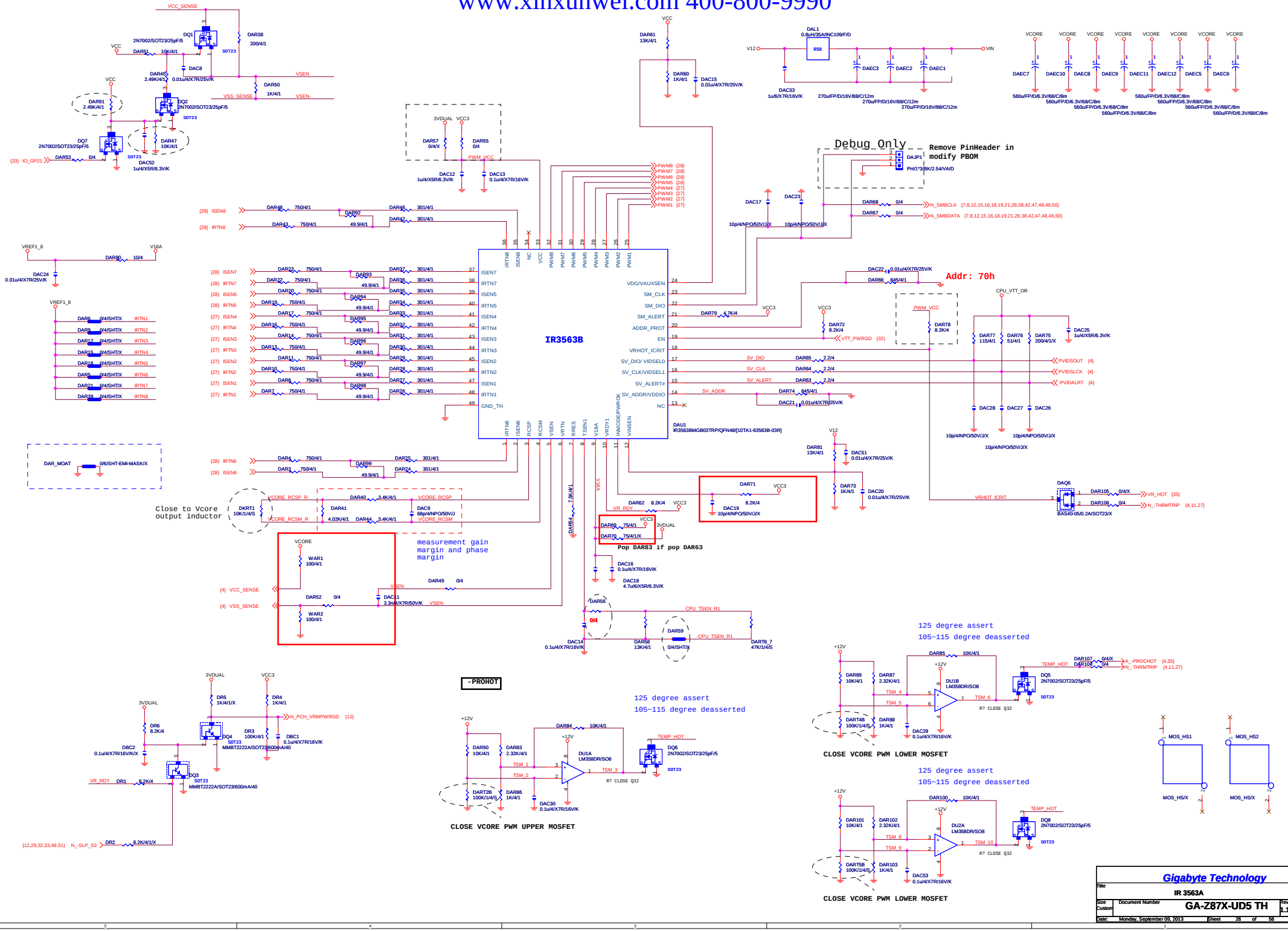
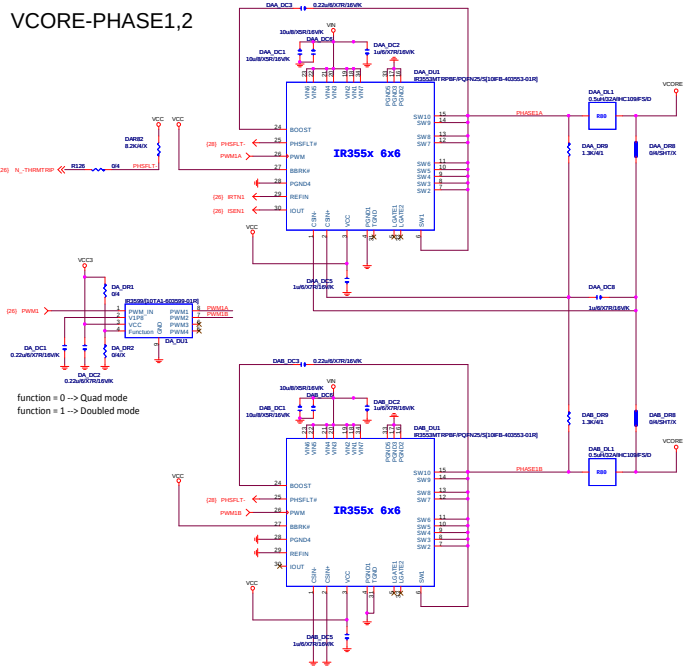
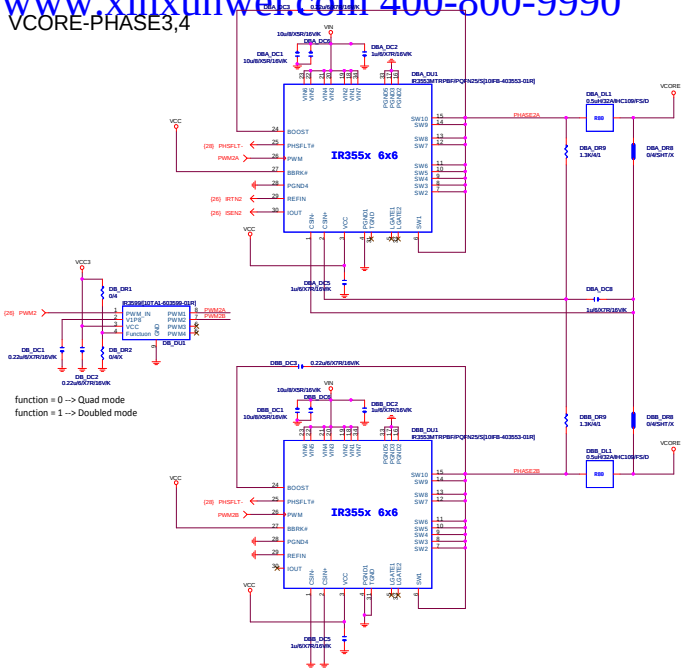


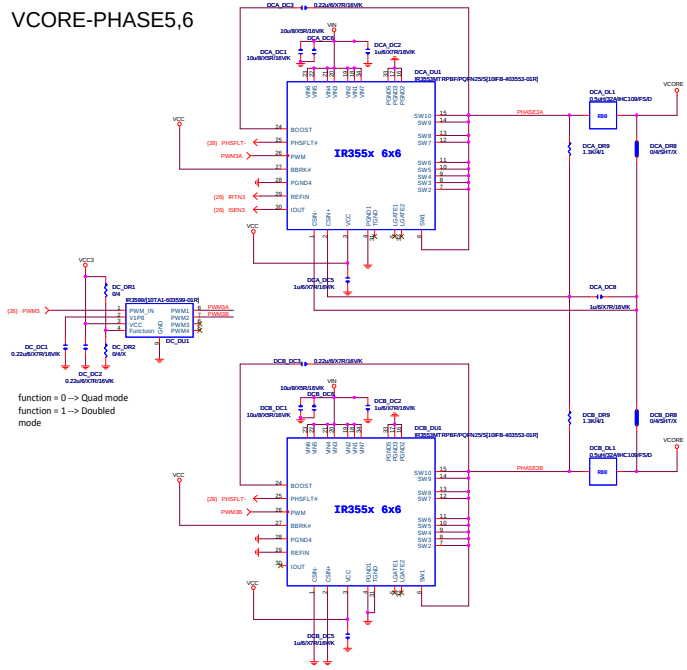
VCORE-PHASE1,2



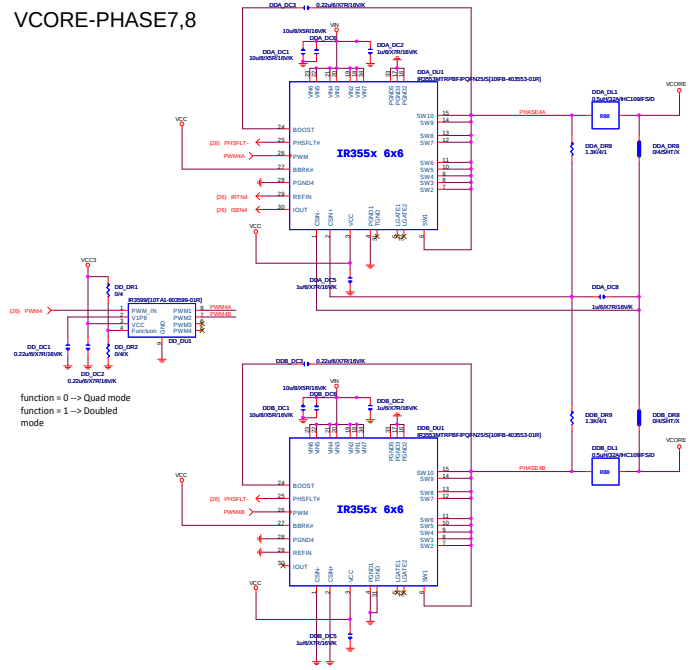
VCORE-PHASE3,4



VCORE-PHASE5,6



VCORE-PHASE7,8



Gigabyte Technology		
File: CPU CORE VR		
Size: Custom	Document Number: GA-Z87X-UD5 TH	Rev: 1.12
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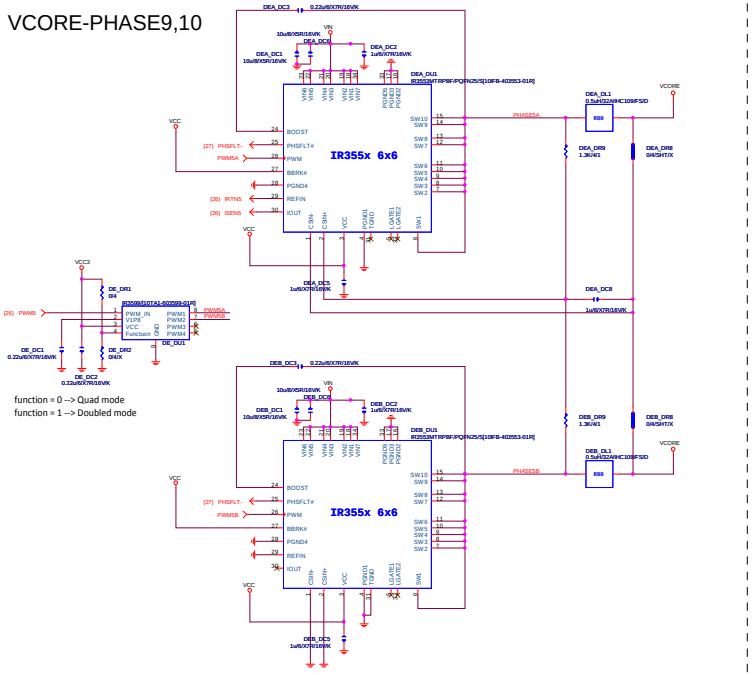
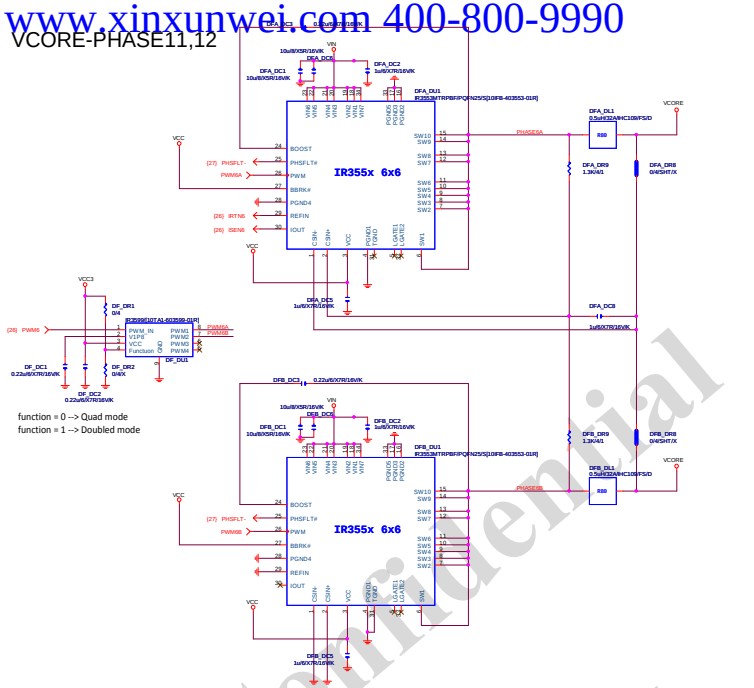
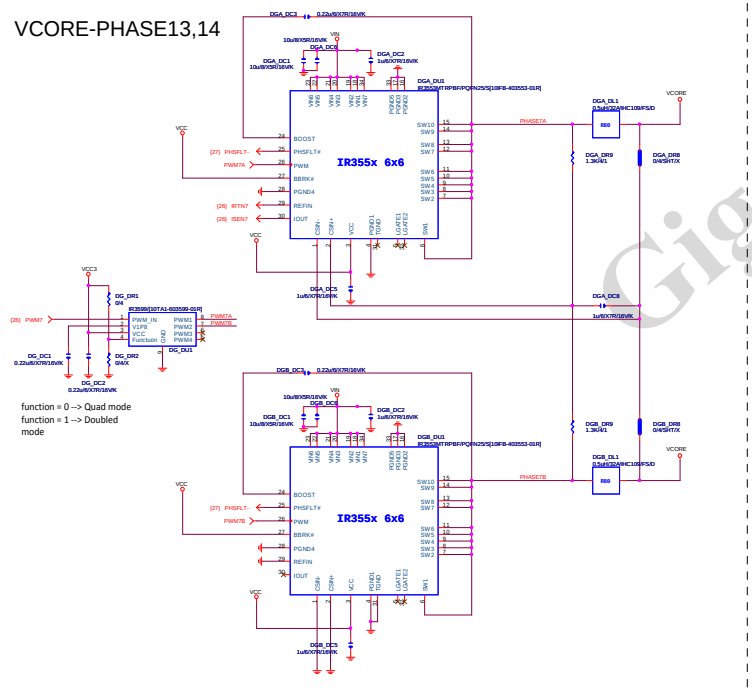
VCORE-PHASE9,10



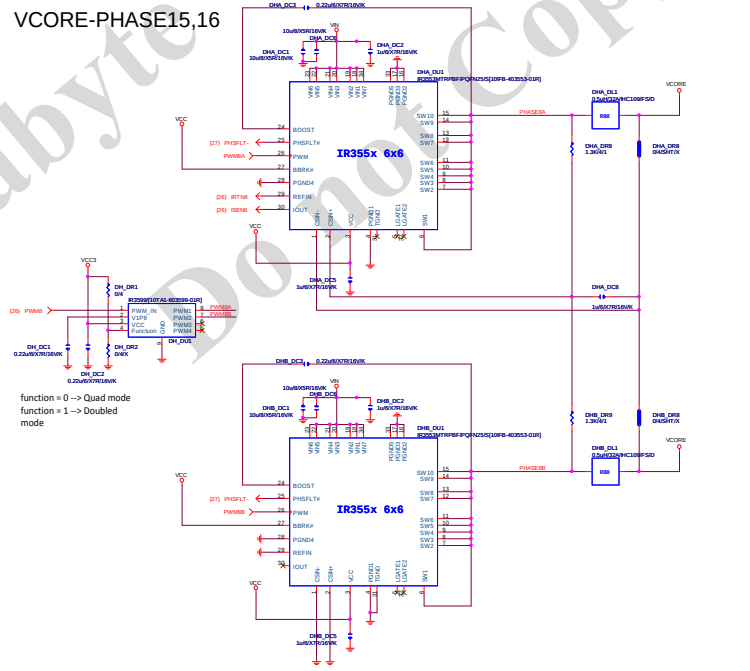
VCORE-PHASE11,12



VCORE-PHASE13,14



VCORE-PHASE15,16



Gigabyte Technology		
File: IR3553-VCORE		
Size: Custom	Document Number: GA-Z87X-UD5 TH	Rev: 1.12
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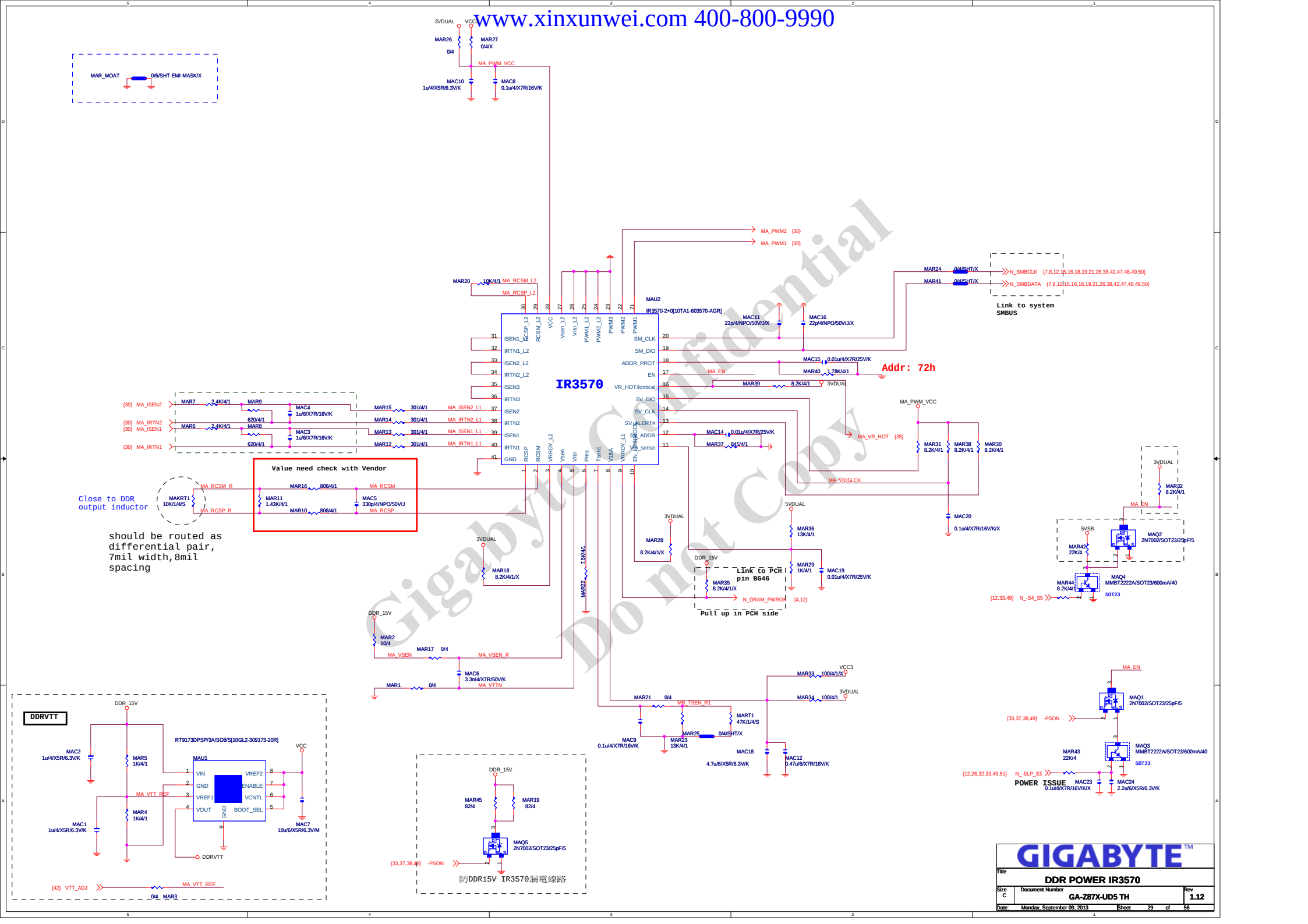
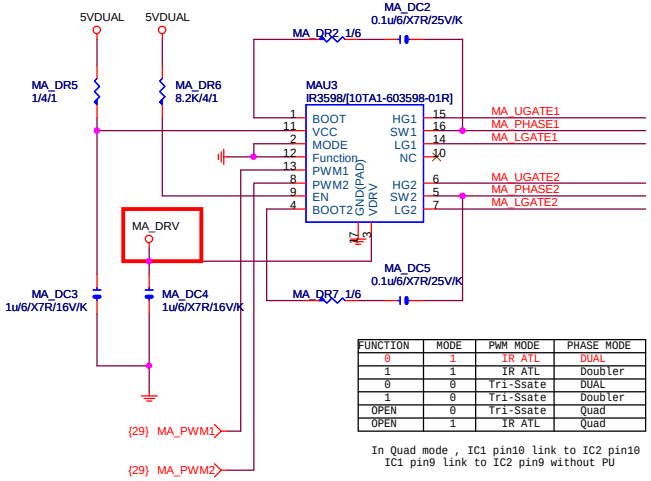
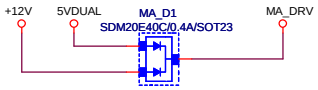


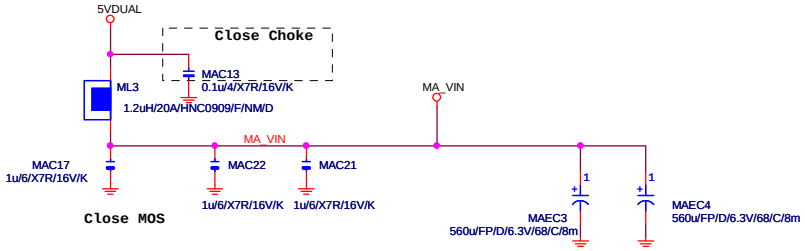
DDR_15V

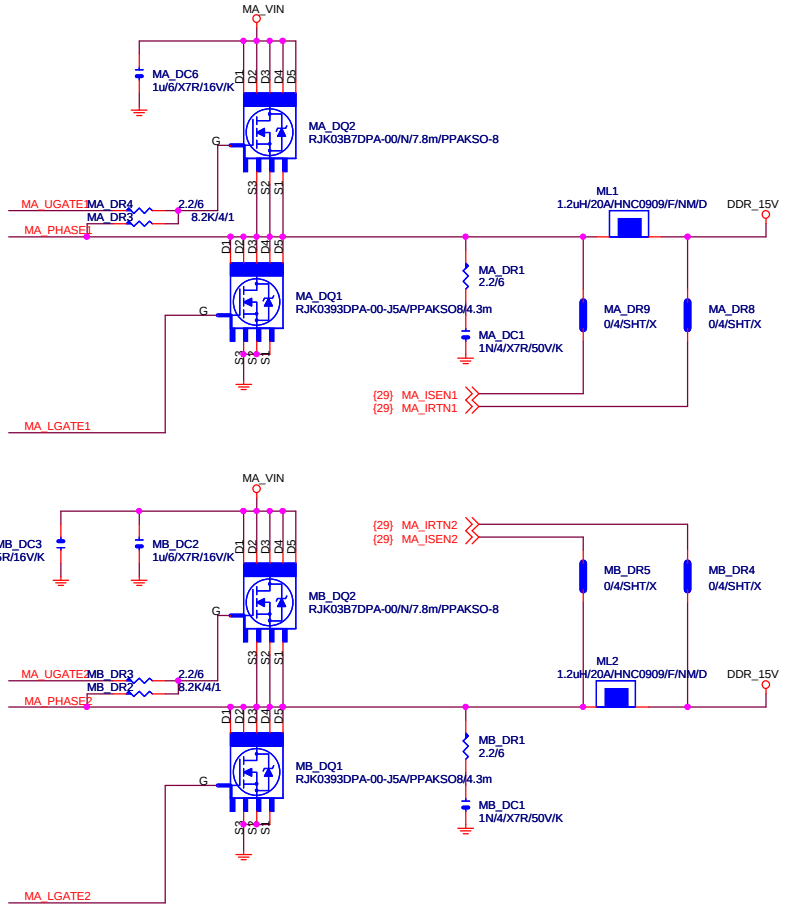


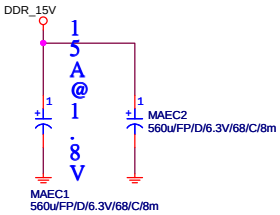
FUNCTION	MODE	PWM MODE	PHASE MODE
0	1	IR ATL	DUAL
1	1	IR ATL	Doubler
0	0	Tri-Ssate	DUAL
1	0	Tri-Ssate	Doubler
OPEN	0	Tri-Ssate	Quad
OPEN	1	IR ATL	Quad

In Quad mode , IC1 pin10 link to IC2 pin10
IC1 pin9 link to IC2 pin9 without PU









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Title: IR3570		
Size: Custom	Document Number: GA-Z87X-UD5 TH	Rev: 1.12
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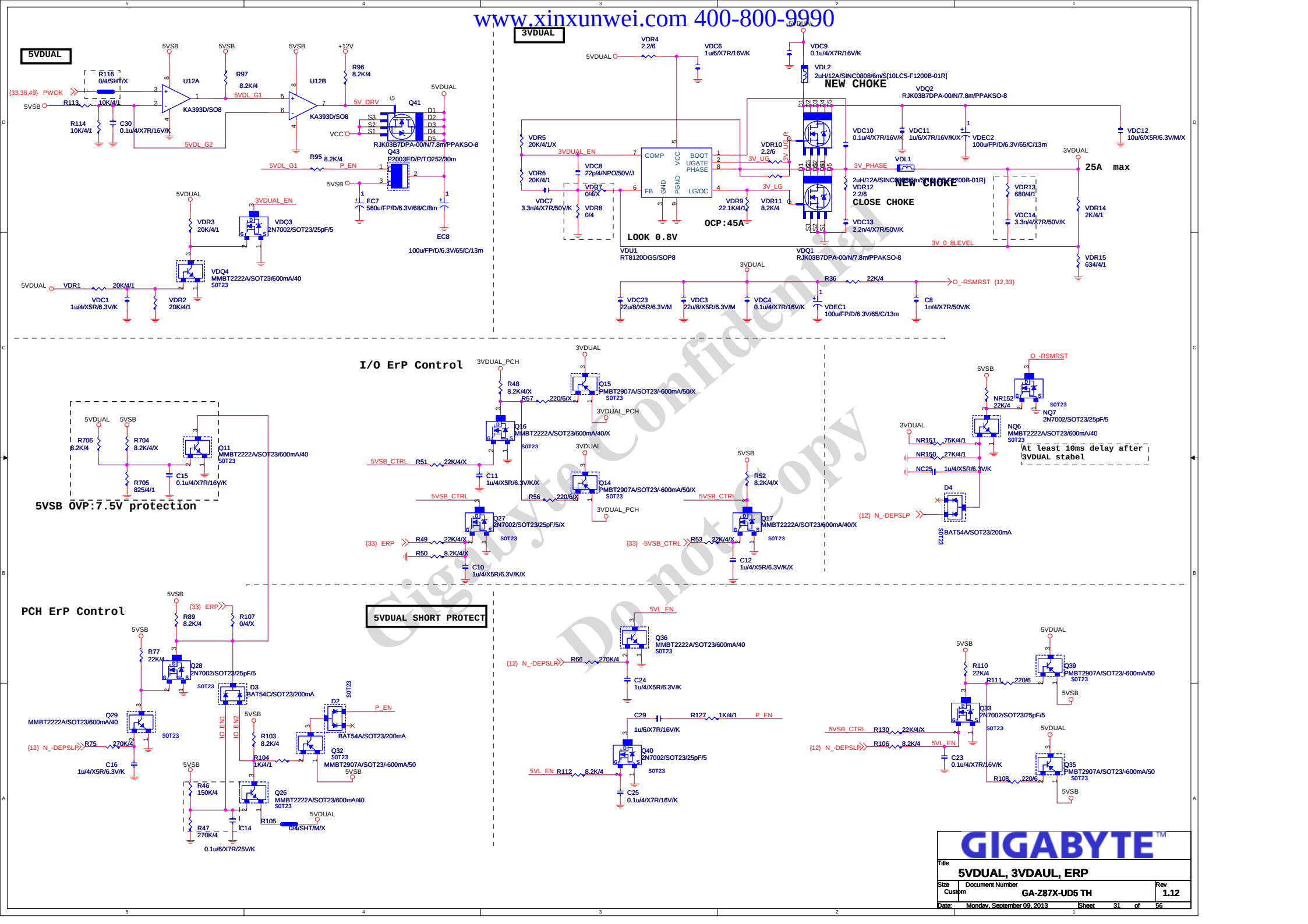
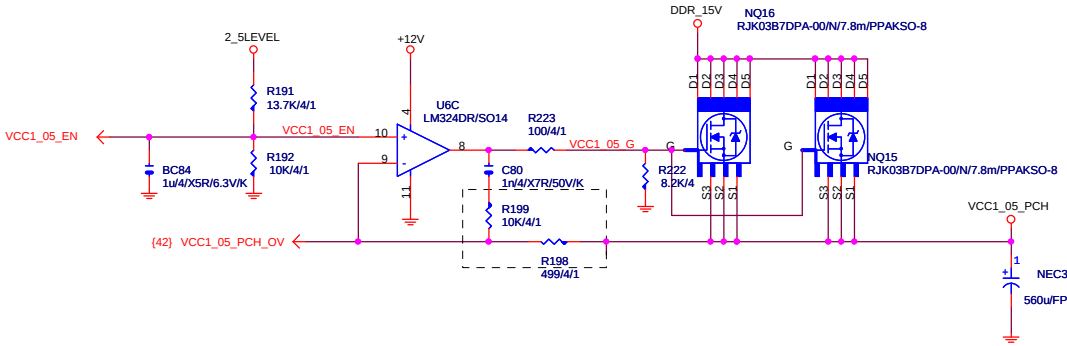
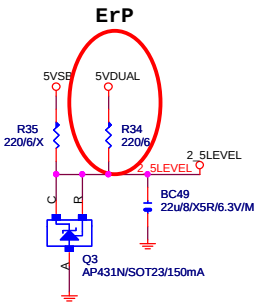


VCC1_05_PCH





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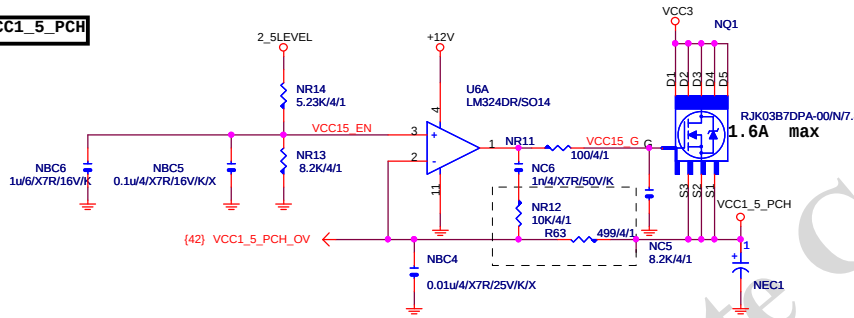


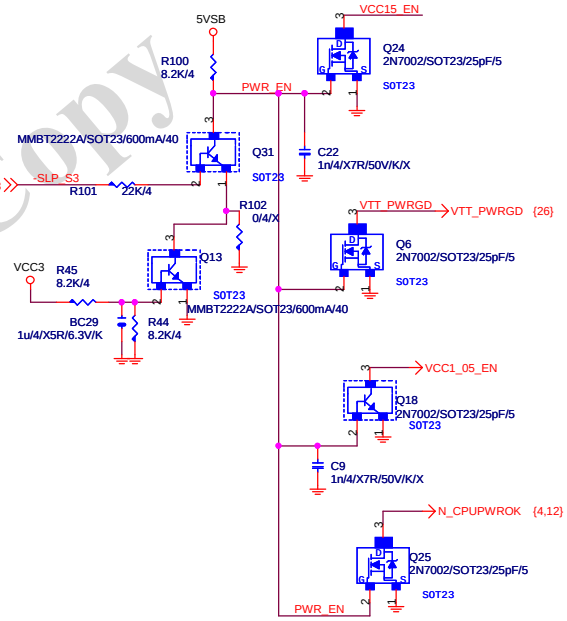
Rise/Fall max 50us

Rise:20% - 80%

Fall :2V- 0.8V

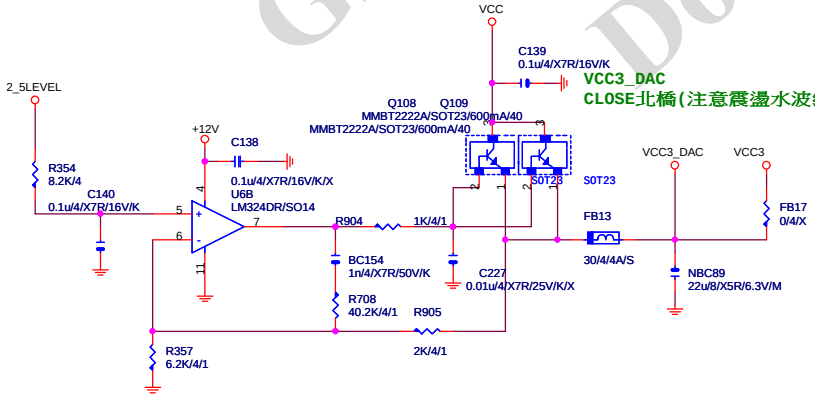
At least 10ms delay after 3VDUAL ready

Pop when PCH & SIO both use 3VDUAL-PCH



VCC3_DAC

(3.3V/70mA+360uA)



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Title	VCC 1.05 PCH, VCC1.5 PCH, CC3 DAC	
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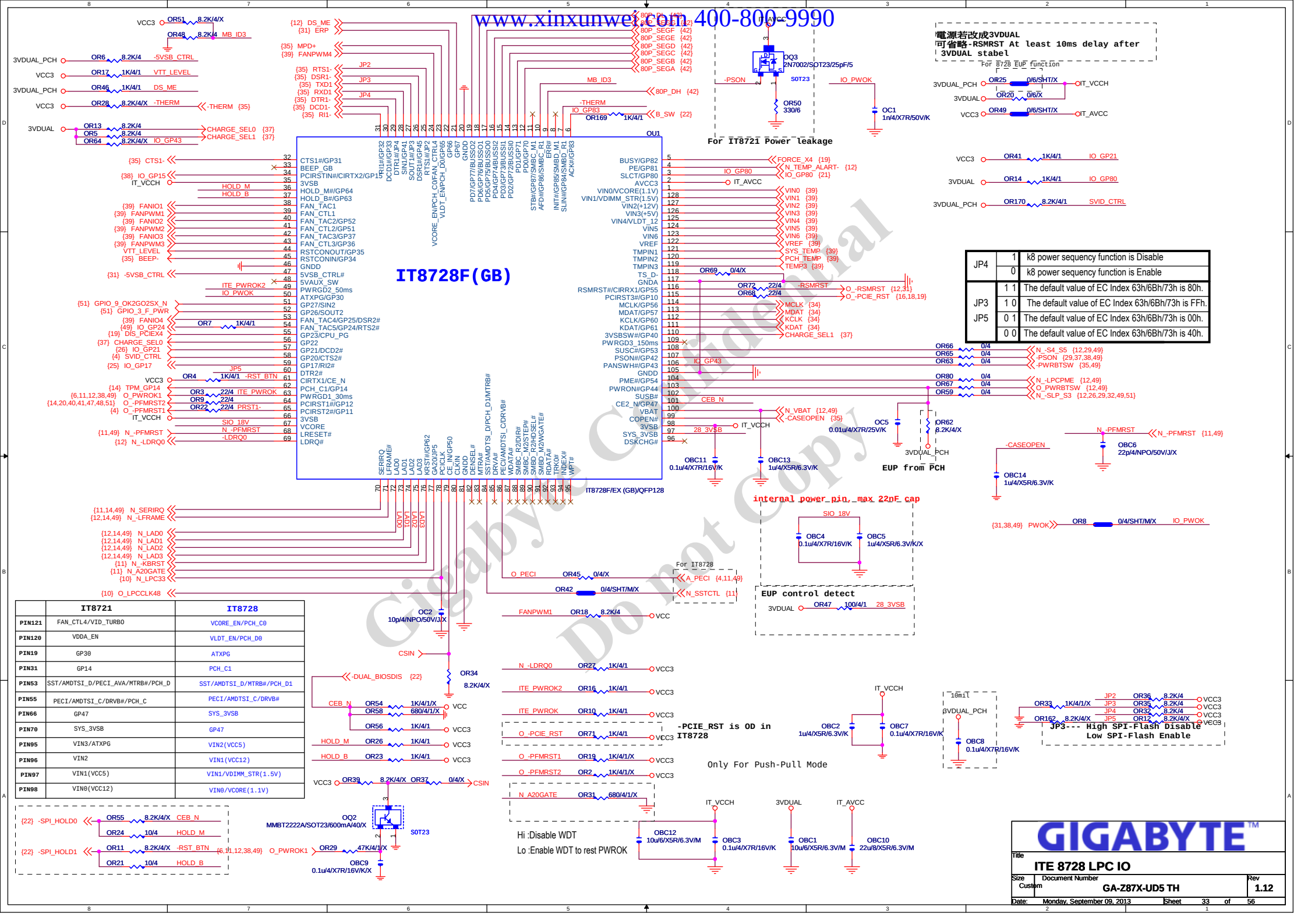

JP4	1	k8 power sequency function is Disable
	0	k8 power sequency function is Enable
JP3 JP5	1 1	The default value of EC Index 63h/6Bh/73h is 80h.
	1 0	The default value of EC Index 63h/6Bh/73h is FFh.
	0 1	The default value of EC Index 63h/6Bh/73h is 00h.
	0 0	The default value of EC Index 63h/6Bh/73h is 40h.

	IT8721	IT8728
PIN121	FAN_CTL4/VID_TURBO	VCORE_EN/PCH_C0
PIN120	VDDA_EN	VLDT_EN/PCH_D0
PIN19	GP30	ATXPG
PIN31	GP14	PCH_C1
PIN53	SST/AMDTSI_D/PECI_AVA/MTRB#/PCH_D	SST/AMDTSI_D/MTRB#/PCH_D1
PIN55	PECI/AMDTSI_C/DRVB#/PCH_C	PECI/AMDTSI_C/DRVB#
PIN66	GP47	SYS_3VSB
PIN70	SYS_3VSB	GP47
PIN95	VIN3/ATXPG	VIN2(VCC5)
PIN96	VIN2	VIN1(VCC12)
PIN97	VIN1(VCC5)	VIN1/VDIMM_STR(1.5V)
PIN98	VIN0(VCC12)	VIN0/VCORE(1.1V)

Title	ITE 8728 LPC IO	
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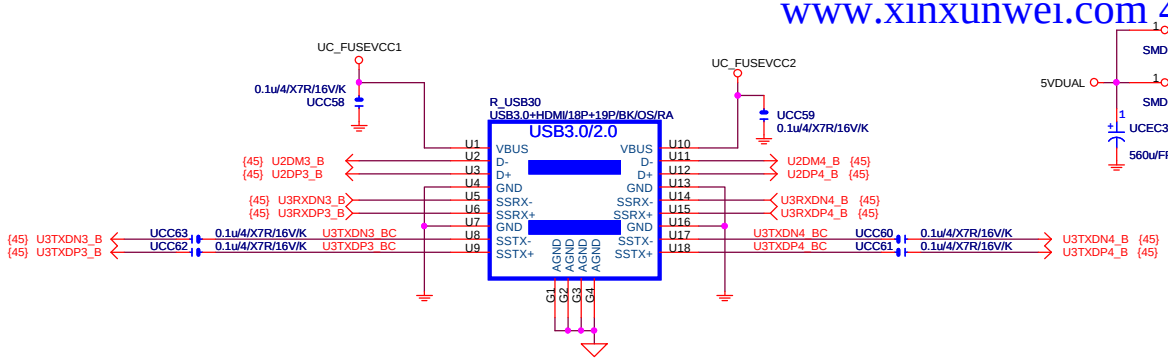
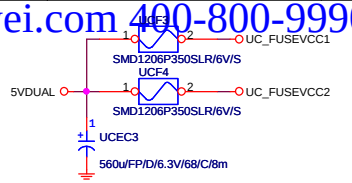
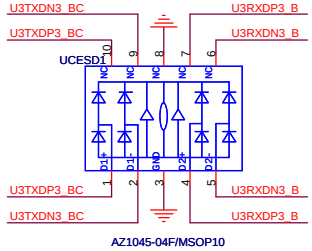
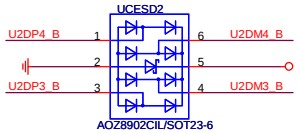


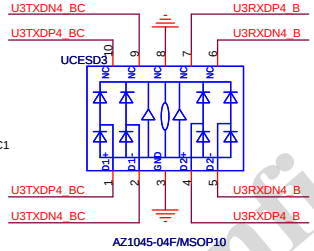




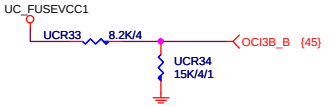
Close to connector

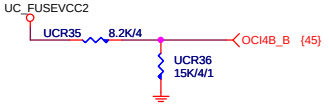


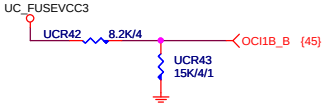
Close to connector

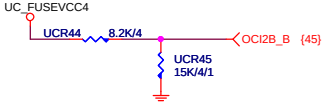


Close to connector

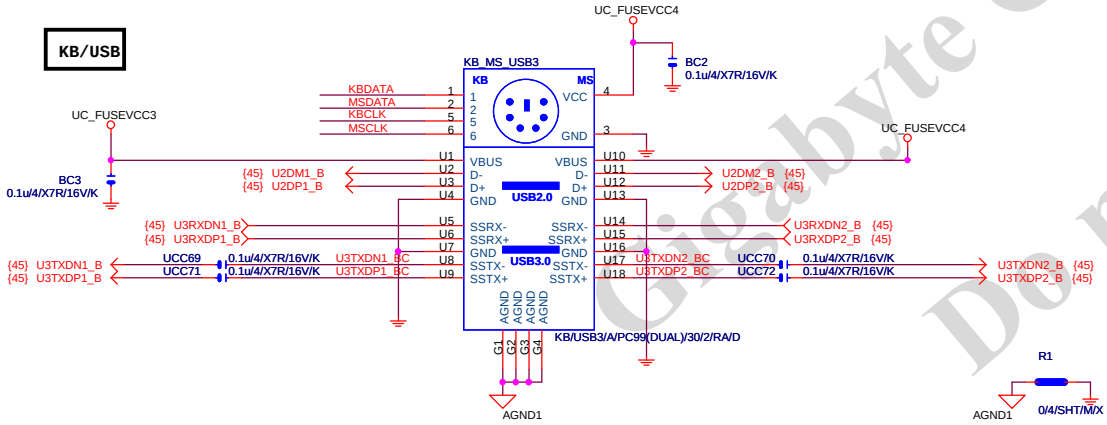


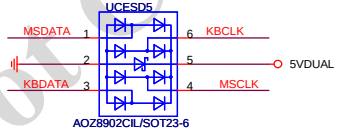




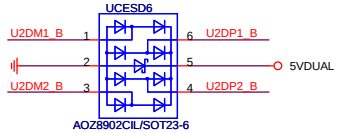


KB/USB

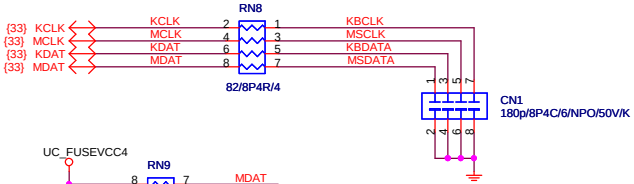


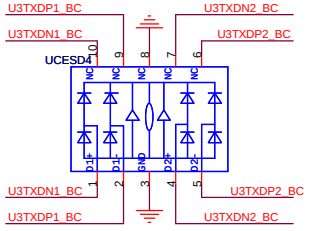


Close to connector

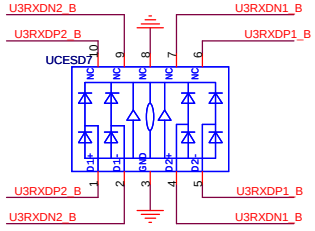


Close to connector

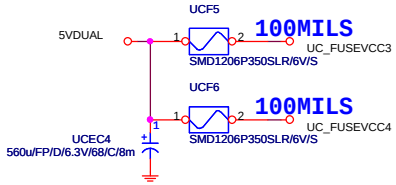




Close to connector



Close to connector



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Title	USB3_ESATA / KB_USB3	
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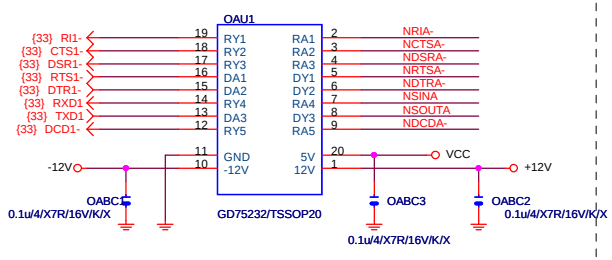
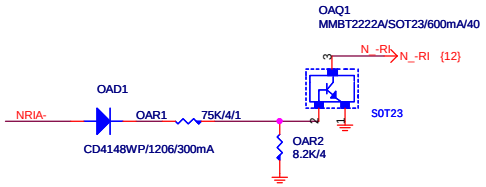
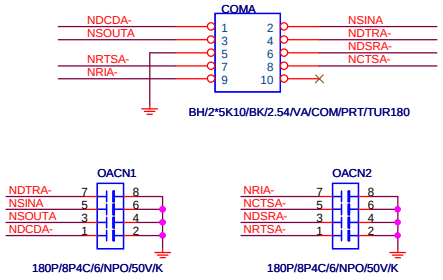
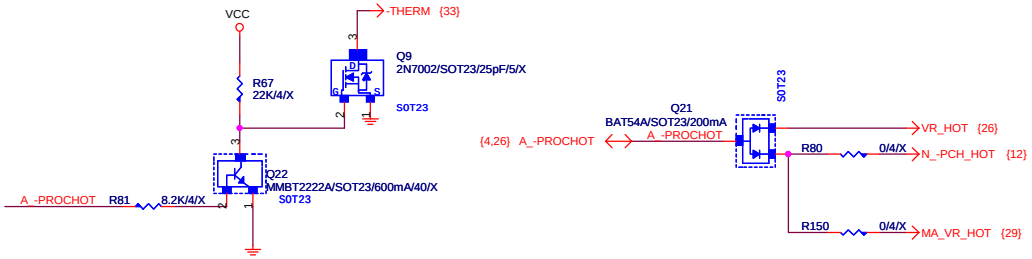
COMA



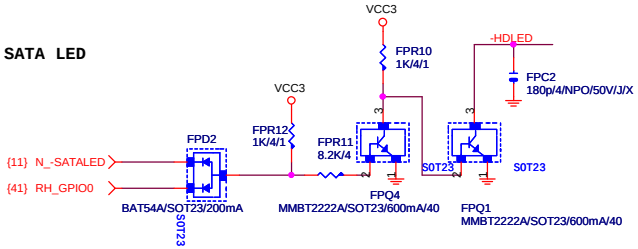
COM RI

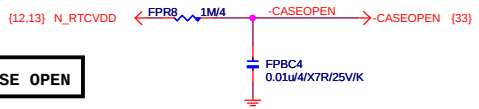




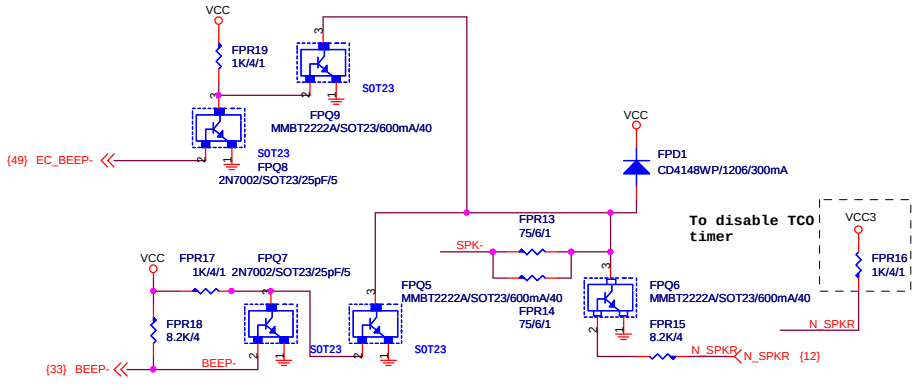


SATA LED

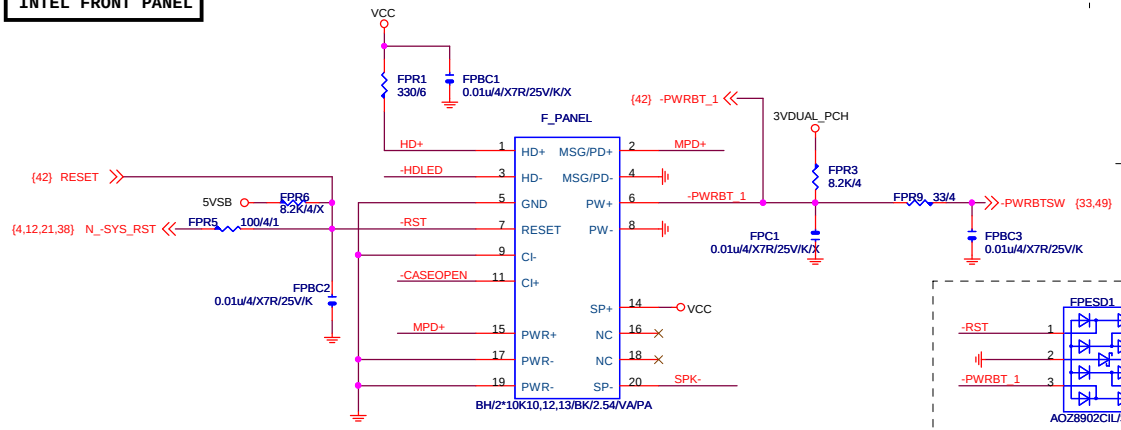


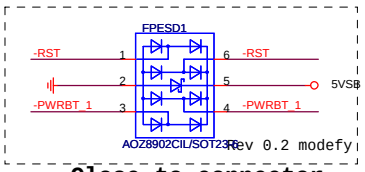


CASE OPEN



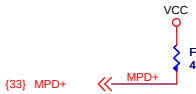
INTEL FRONT PANEL





Rev 0.2 modefy

Close to connector



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Title	FP, COM, -PHOT	
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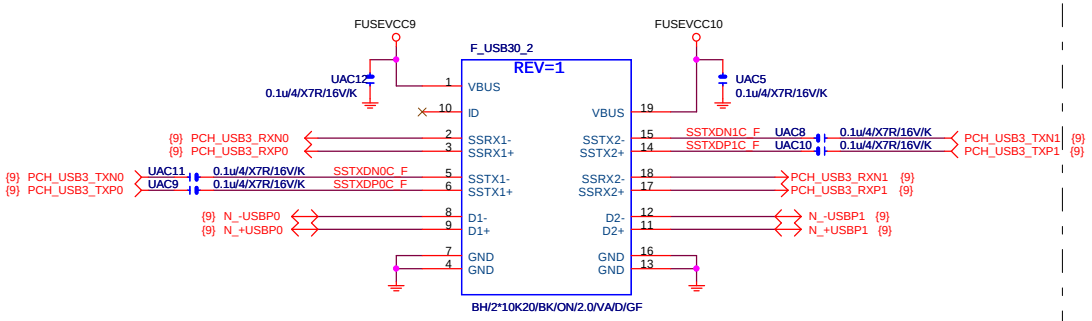
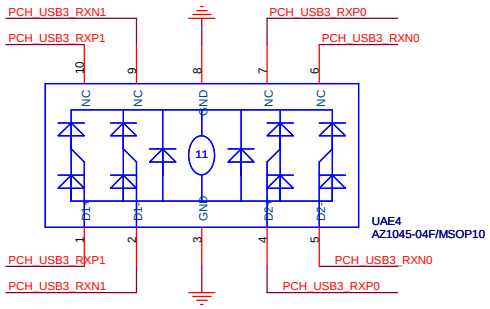
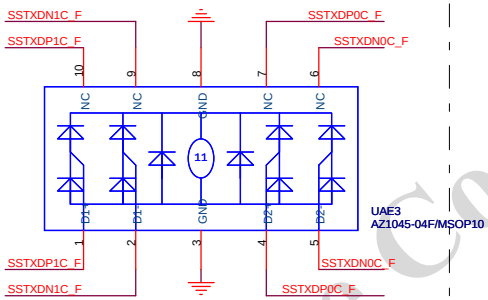
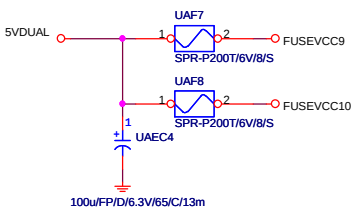
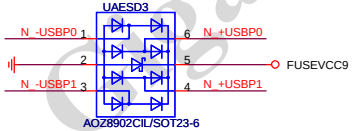
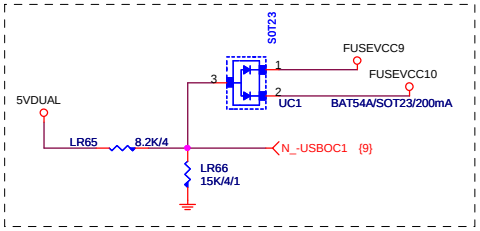


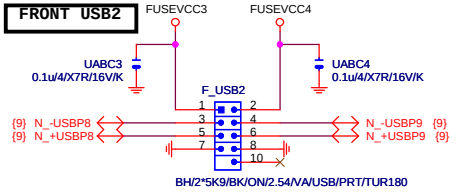


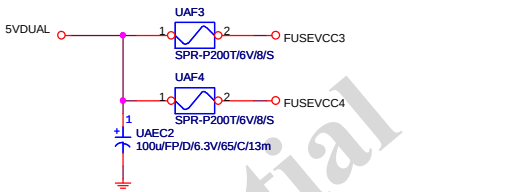


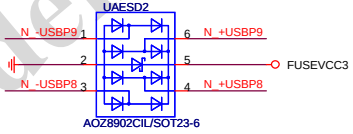




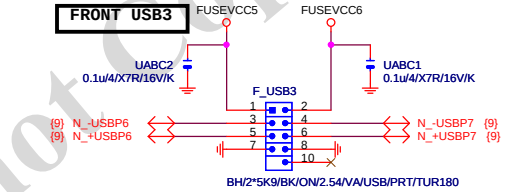


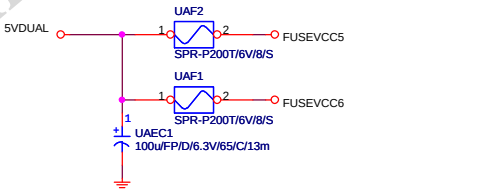


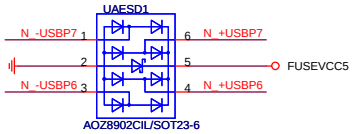




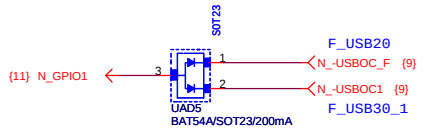
Close to connector

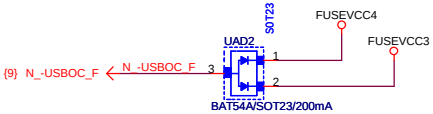


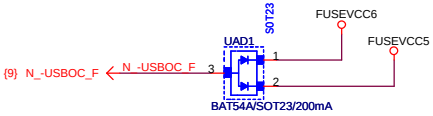


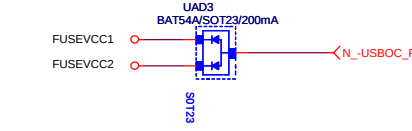


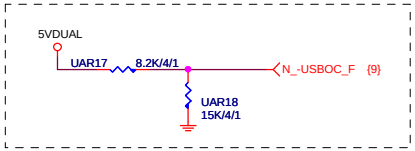
Close to connector

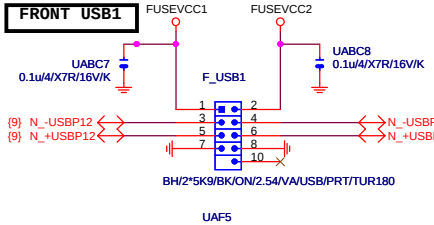


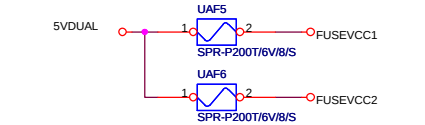


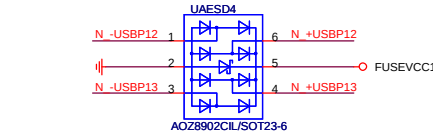












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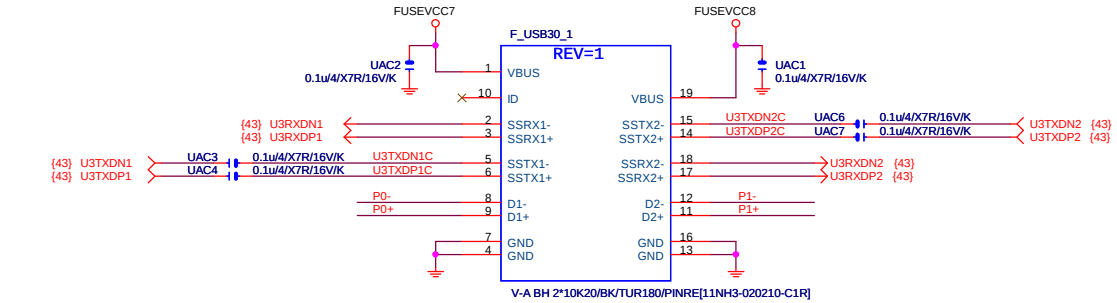

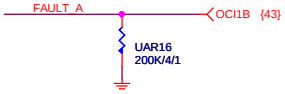

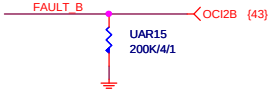

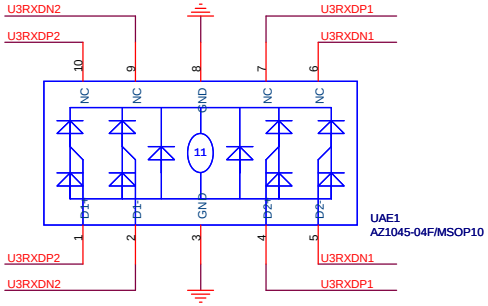

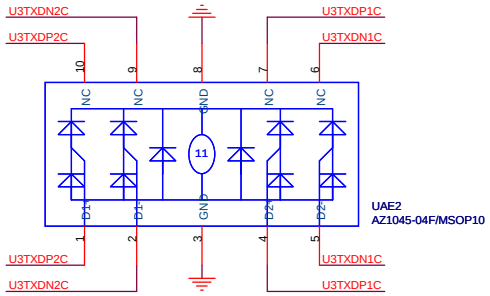

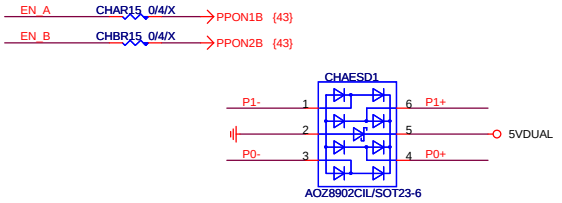

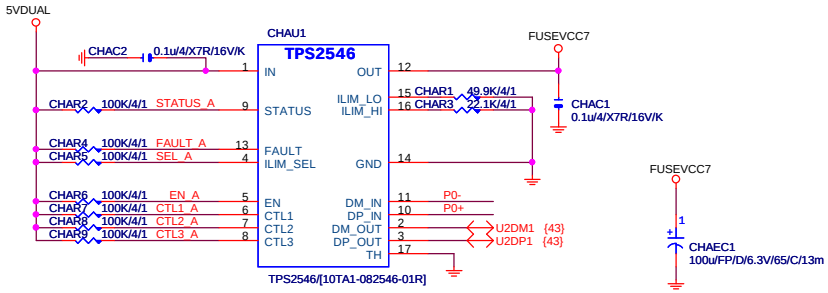

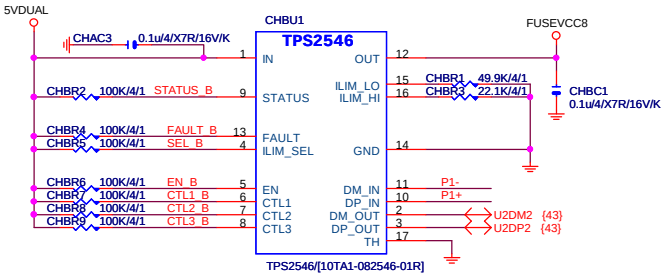

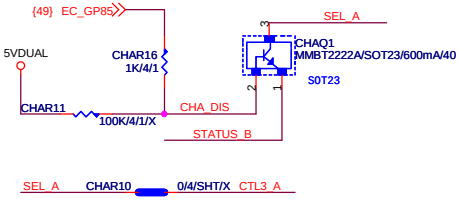

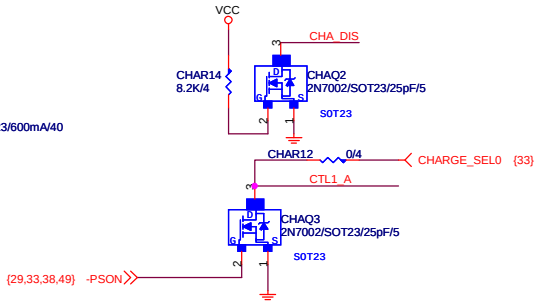

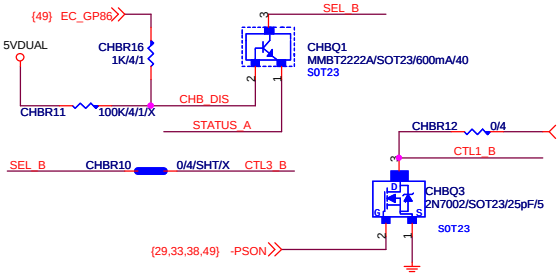

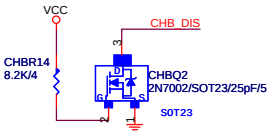

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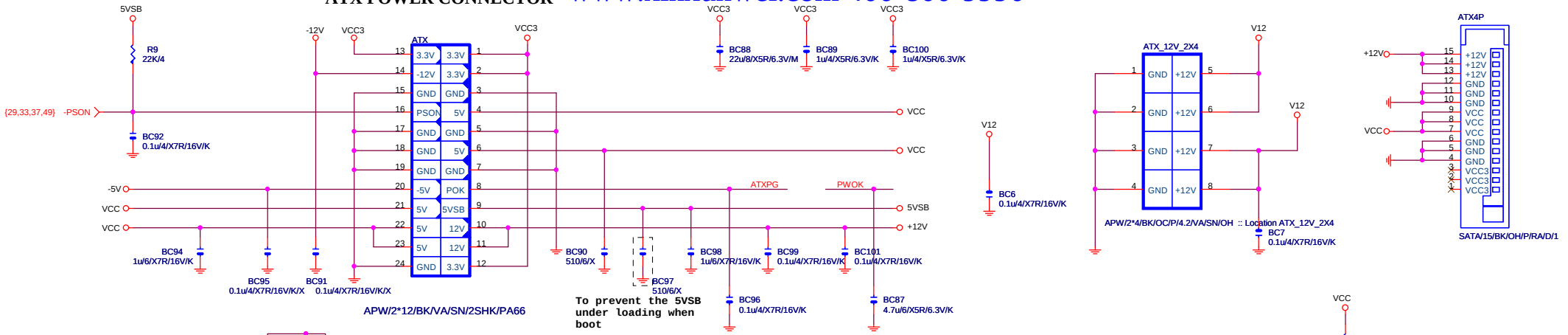
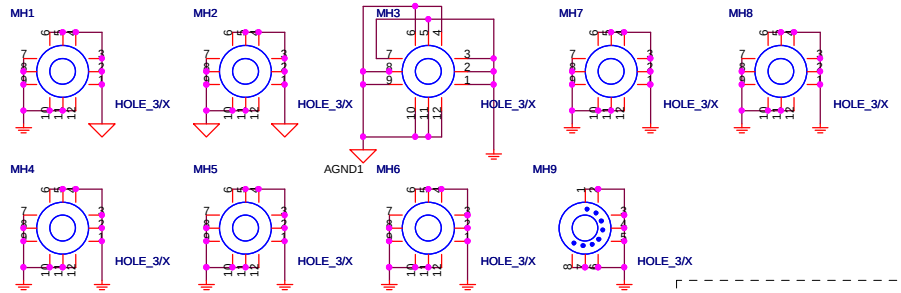
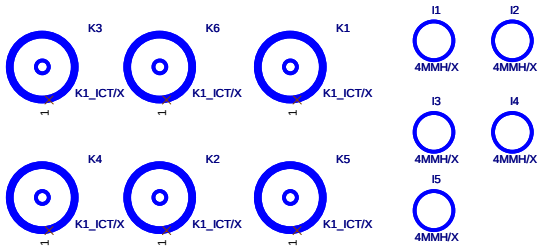
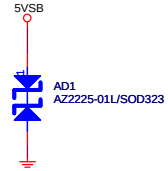
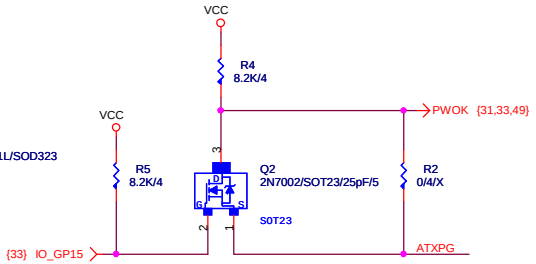
ATX POWER CONNECTOR

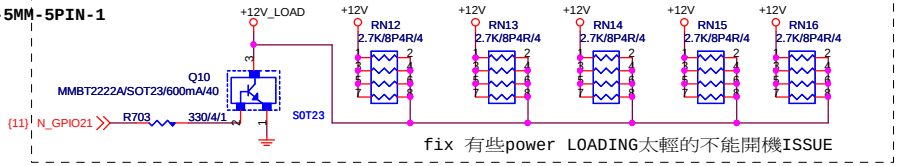


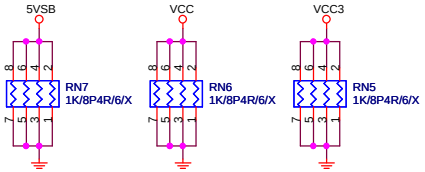








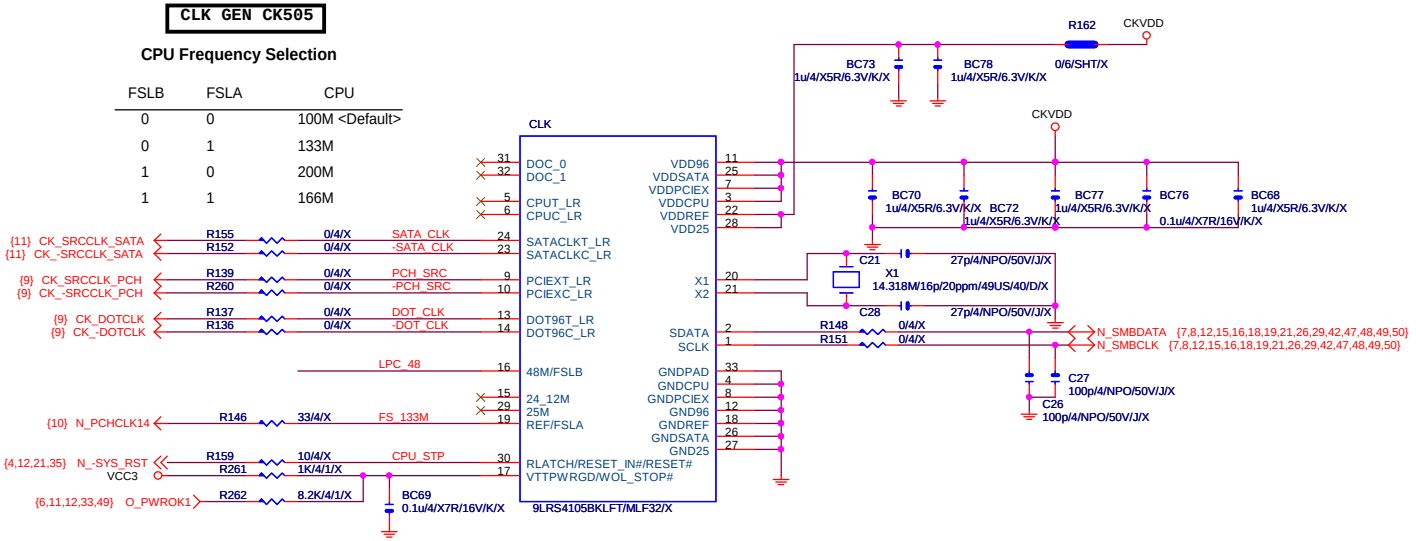


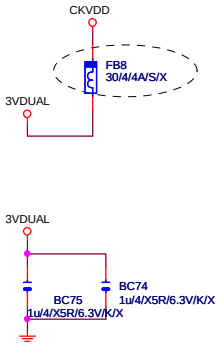


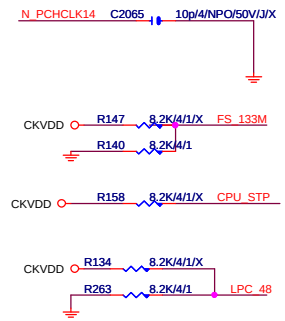
CLK GEN CK505

CPU Frequency Selection

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







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TEMP H/W MONITOR

{33} VREF
{33} SYS_TEMP
{33} PCH_TEMP
{33} TEMP3
OR73 10K/4/1
OR151 10K/4/1
OR152 10K/4/1
OC7 1u/4/X5R/6.3V/K
OC6 1u/4/X5R/6.3V/K
RS_SYS 10K/1/4/S
RS_PCH 10K/1/4/S
OC120 1u/4/X5R/6.3V/K/X
Close SIO
Close PCH

VOLTAGE-- H/W MONITOR

IT8728 BX
IT8728 CX
VCORE
DDR_15V
VCC
VCC3
+12V
CPU_VAXG
VCC
OR75 8.2K/4/1
OR74 8.2K/4/1
OR60 7.15K/4/1/X
OR57 6.49K/4/1
OR79 75K/4/1
OR76 8.2K/4/1
OR78 15K/4/1
{33} VIN5
{33} VIN6
{33} VIN1
{33} VIN2
{33} VIN4
{33} VIN3
2.0V
2.0V
OC9 1u/4/X5R/6.3V/K
OC8 1u/4/X5R/6.3V/K
OC4 1u/4/X5R/6.3V/K
OR61 10K/4/1
OC12 1u/4/X5R/6.3V/K
OR70 15K/4/1
OC10 1u/4/X5R/6.3V/K
OC11 1u/4/X5R/6.3V/K
OR77 10K/4/1
{33} VIN0
OR53 8.2K/4/1
VCORE0
OC3 1u/4/X5R/6.3V/K
The division voltage of VIN2 & VIN3 must be around 2.9V

CPU SMART FAN

VCC
ECR76 8.2K/4/1
{49} EC_FANPWM1
OR1 100/4/1
Anti Spike
+12V
R14 3.3K/4/1
R129 0/4
R15 15K/4/1
R17 6.2K/4/1
OC123 0.047u/4/X7R/16V/K
EC_FANIO1 {49}
C31 0.1u/4/X7R/16V/K
CPU_FAN FAN/1*4/WH/A3/PA66

Linear SYS_FAN

VCC
VCC3
+12V
R238 1K/4/1/X
R239 1K/4/1
R240 8.2K/4/1
{33} FANPWM1
R242 22K/4
U11B
LM358DR/SO8
R241 8.2K/4/1
BC106 1u/4/X5R/6.3V/K
R243 22K/4
Q60 P2003ED/P/TO252/30m
R206 0/4/X
R912 0/4
C34
EC6 100u/OS/D/16V/66/C/30m
0.1u/4/X7R/16V/K
R906 8.2K/4
R214 3.3K/4/1
R207
R215 15K/4/1
6.2K/4/1
OC122 0.047u/4/X7R/16V/K
FANIO1 {33}
SYS_FAN2 FAN/1*4/BK/A3/PA66

R244 1K/4/1/X
R245 1K/4/1
R246 8.2K/4/1
{33} FANPWM2
R248 22K/4
U11A
LM358DR/SO8
R247 8.2K/4/1
BC107 1u/4/X5R/6.3V/K
R249 22K/4
Q61 P2003ED/P/TO252/30m
R16 0/4/X
R913 0/4
C35
EC9 100u/OS/D/16V/66/C/30m
0.1u/4/X7R/16V/K
R907 8.2K/4
R19 3.3K/4/1
R11
R6 15K/4/1
6.2K/4/1
OC124 0.047u/4/X7R/16V/K
FANIO2 {33}
SYS_FAN3 FAN/1*4/BK/A3/PA66

R257 1K/4/1/X
R258 1K/4/1
R256 8.2K/4/1
{33} FANPWM3
R255 22K/4
U183A
LM358DR/SO8
R259 8.2K/4/1
BC108 1u/4/X5R/6.3V/K
R264 22K/4
Q63 P2003ED/P/TO252/30m
R18 0/4/X
R914 0/4
C36
EC10 100u/OS/D/16V/66/C/30m
0.1u/4/X7R/16V/K
R909 8.2K/4
R25 3.3K/4/1
R33
R32 15K/4/1
6.2K/4/1
OC126 0.047u/4/X7R/16V/K
FANIO3 {33}
SYS_FAN4 FAN/1*4/BK/A3/PA66

R267 1K/4/1/X
R268 1K/4/1
R266 8.2K/4/1
{33} FANPWM4
R265 22K/4
U183B
LM358DR/SO8
R269 8.2K/4/1
BC109 1u/4/X5R/6.3V/K
R270 22K/4
Q64 P2003ED/P/TO252/30m
R42 0/4/X
R915 0/4
C37
EC11 100u/OS/D/16V/66/C/30m
0.1u/4/X7R/16V/K
R910 8.2K/4
R54 3.3K/4/1
R58
R55 15K/4/1
6.2K/4/1
OC127 0.047u/4/X7R/16V/K
FANIO4 {33}
SYS_FAN5 FAN/1*4/BK/A3/PA66

CPUFAN_VCC
R74 1K/4/1
R76 1K/4/1/X
R85 22K/4
R43 22K/4
{49} EC_FANPWM2
U20A
LM358DR/SO8
BC33 0.1u/4/X7R/16V/K
R41 8.2K/4/1
Q5 P2003ED/P/TO252/30m
BC32 1u/4/X5R/6.3V/K
R92 8.2K/4/1
EC2 100u/OS/D/16V/66/C/30m
R252 0/4/X
R908 0/4
C32 0.1u/4/X7R/16V/K
R250 8.2K/4/1
R251 3.3K/4/1
R253
R254 6.2K/4/1
15K/4/1
OC125 0.047u/4/X7R/16V/K
EC_FANIO2 {49}
CPU_OPT FAN/1*4/BK/A3/PA66

CTL5 (follow 1), default 100% duty

Linear SYS_FAN

R73 1K/4/1/X
R72 1K/4/1
R71 22K/4
{49} EC_FANPWM3
R86 8.2K/4/1
U20B
LM358DR/SO8
R128 8.2K/4/1
BC31 1u/4/X5R/6.3V/K
R88 22K/4
Q42 P2003ED/P/TO252/30m
R125 0/4/X
R911 0/4
C33 0.1u/4/X7R/16V/K
R124 8.2K/4/1
R123 3.3K/4/1
R122 15K/4/1
R121 6.2K/4/1
OC121 0.047u/4/X7R/16V/K
EC_FANIO3 {49}
EC5 100u/OS/D/16V/66/C/30m
SYS_FAN1 FAN/1*4/BK/A3/PA66

FOR EMI ONLY
C42 1n/4/X7R/50V/K

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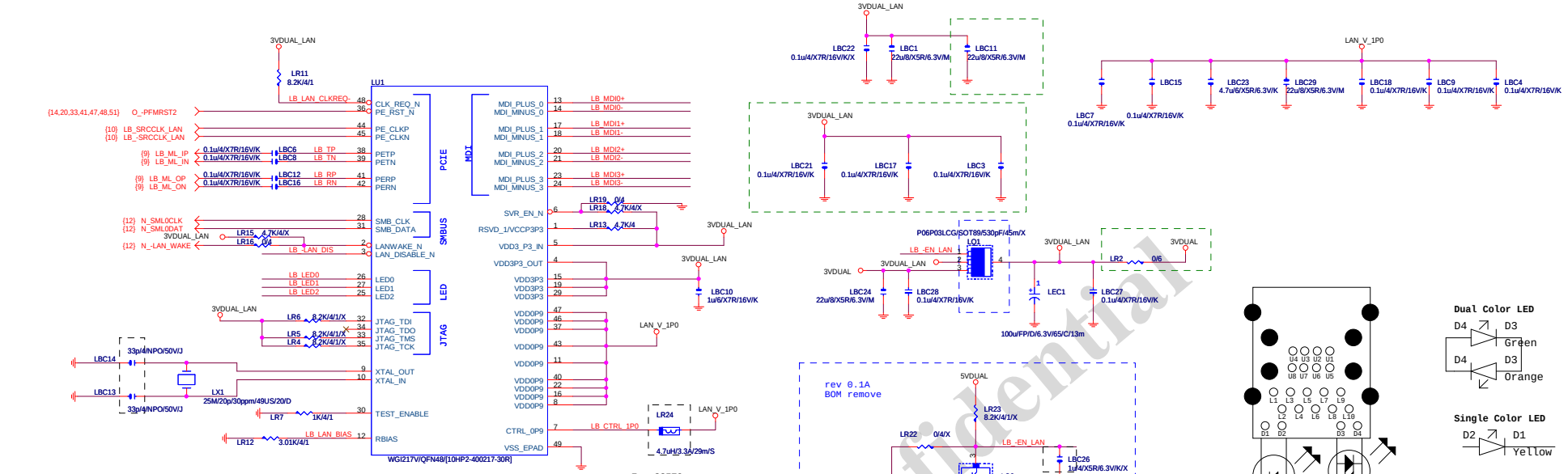
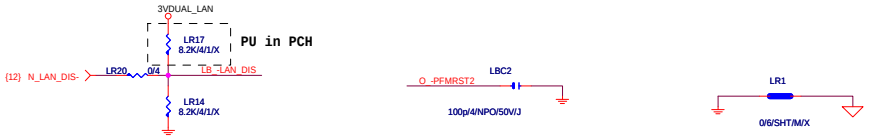
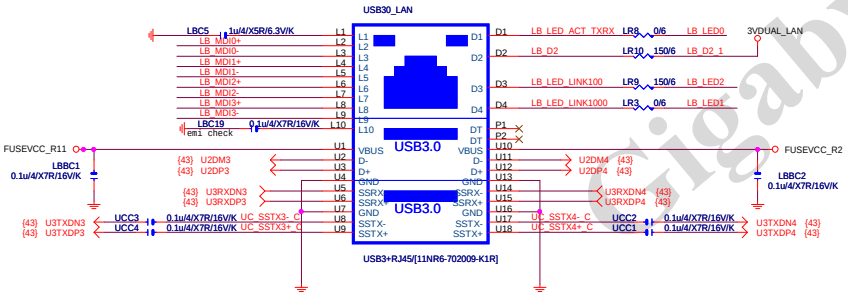
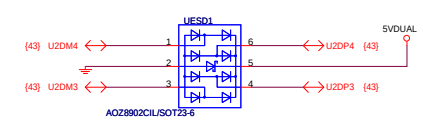
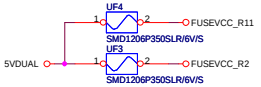


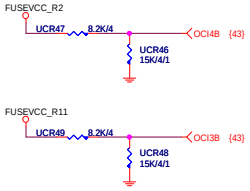


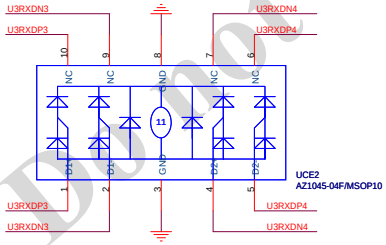


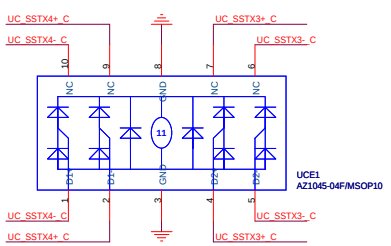




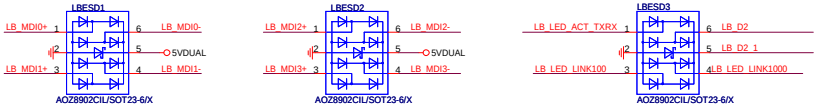
Close to connector

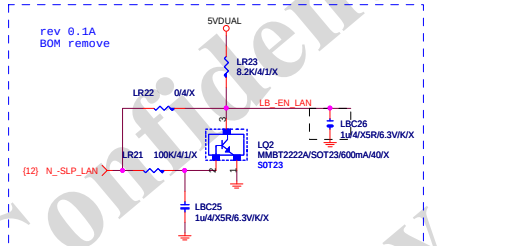


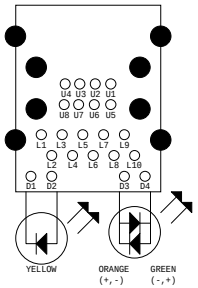




RMA ESD PROTECT







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100Mb	Green
10Mb	Off

Access	Blinking
Link	Yellow

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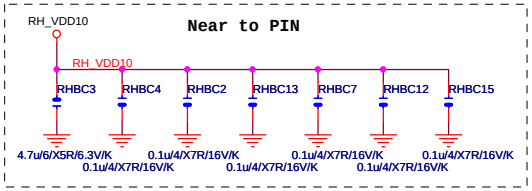

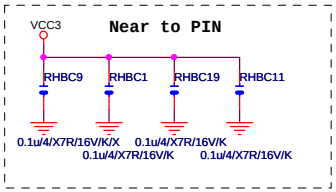

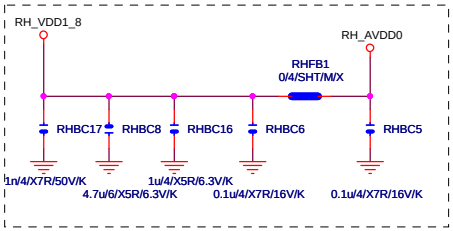

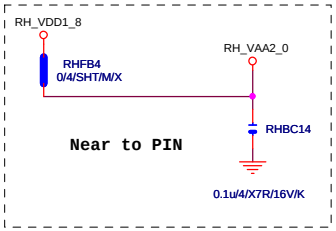

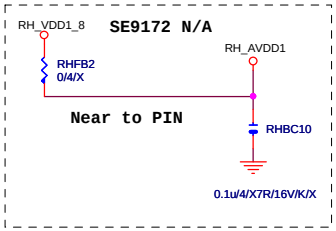

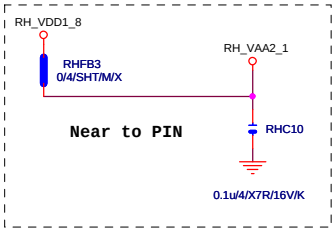

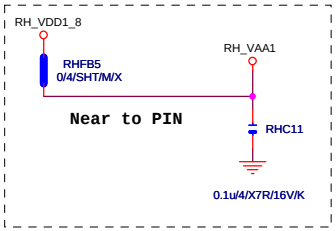

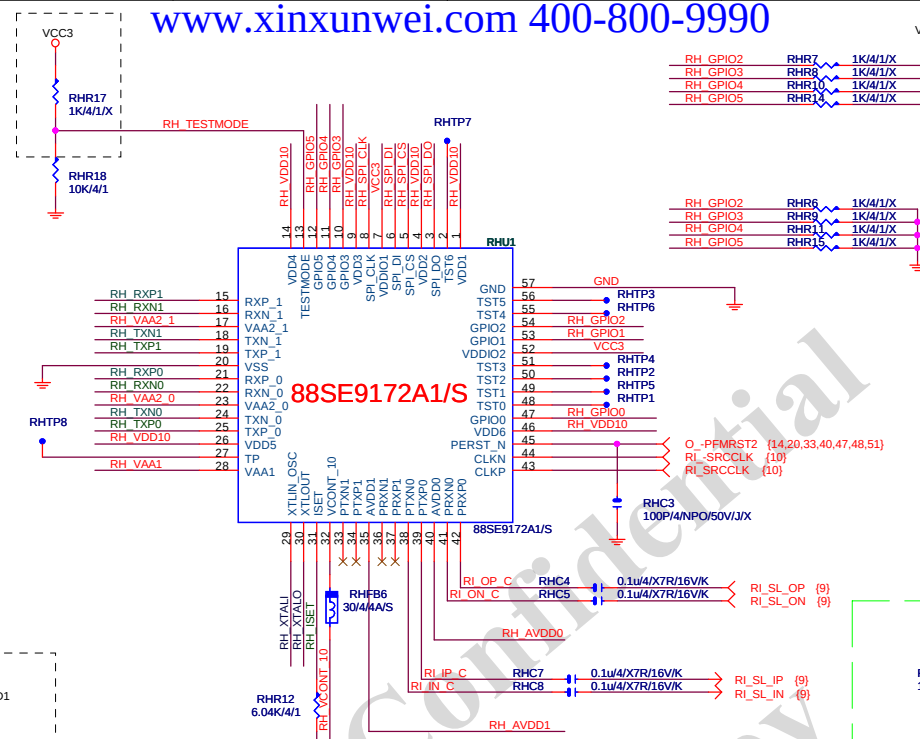

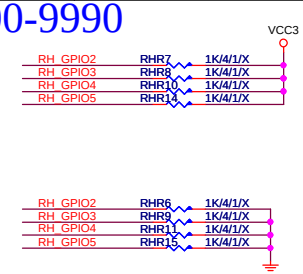

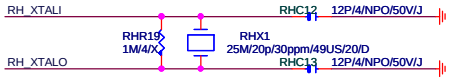

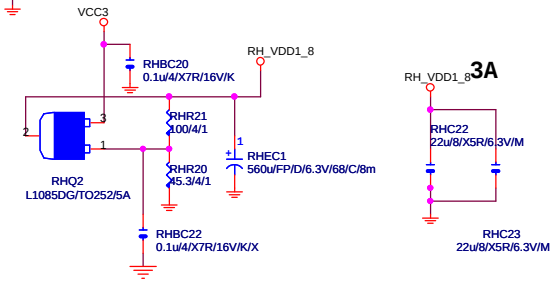

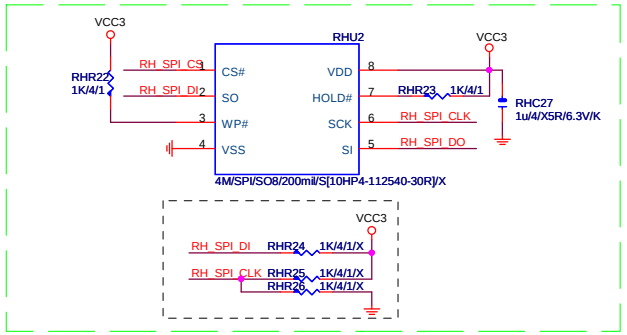

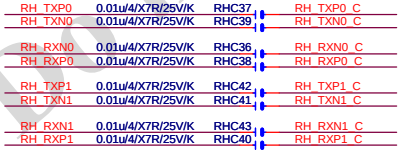

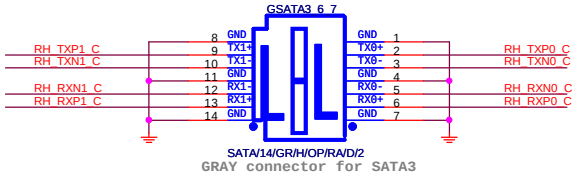

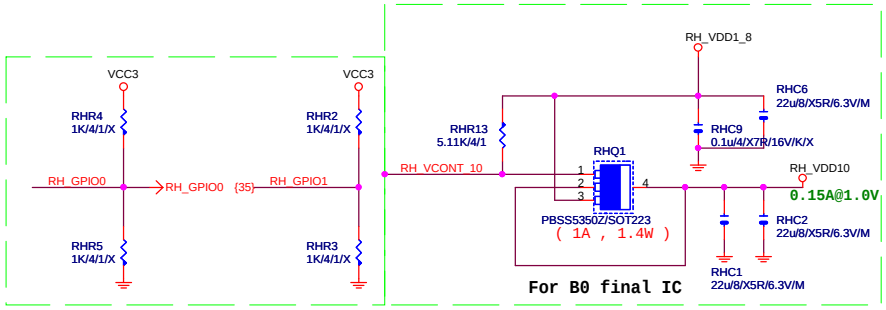

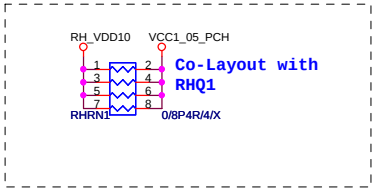

90歐姆:[15/4.5/7.5/4.5/15]

Marvell 9172 Power Requirements
Analog 1.8V 230mA
Core 1.0V 900mA
I/O 3.3V 50mA

GIGABYTE™

Title: Marvell 9172 SATA 3.0		
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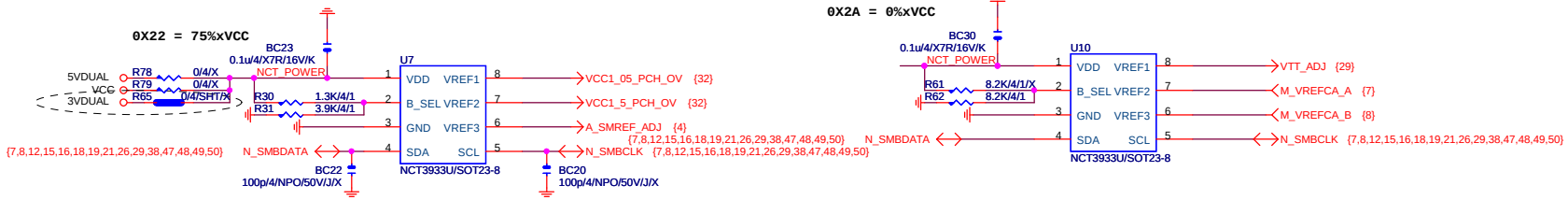
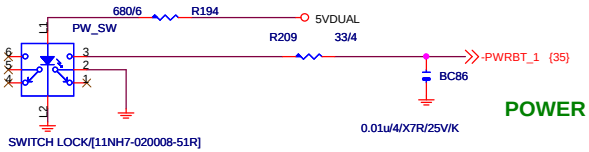
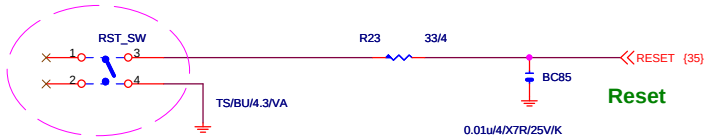
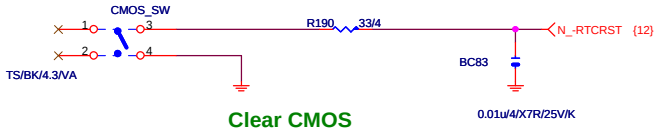




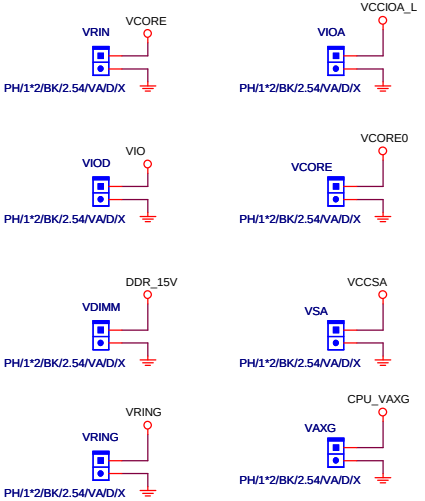
POWER



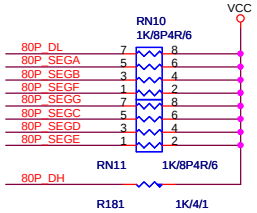
Reset

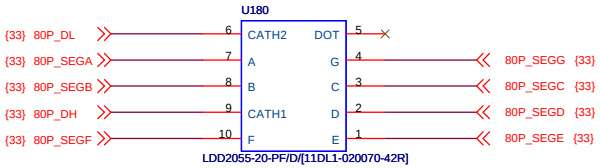


Clear CMOS

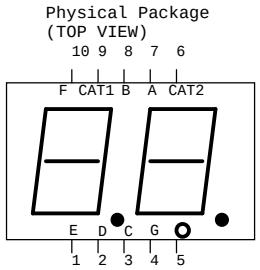


80 PORT





COMMON CATHODE



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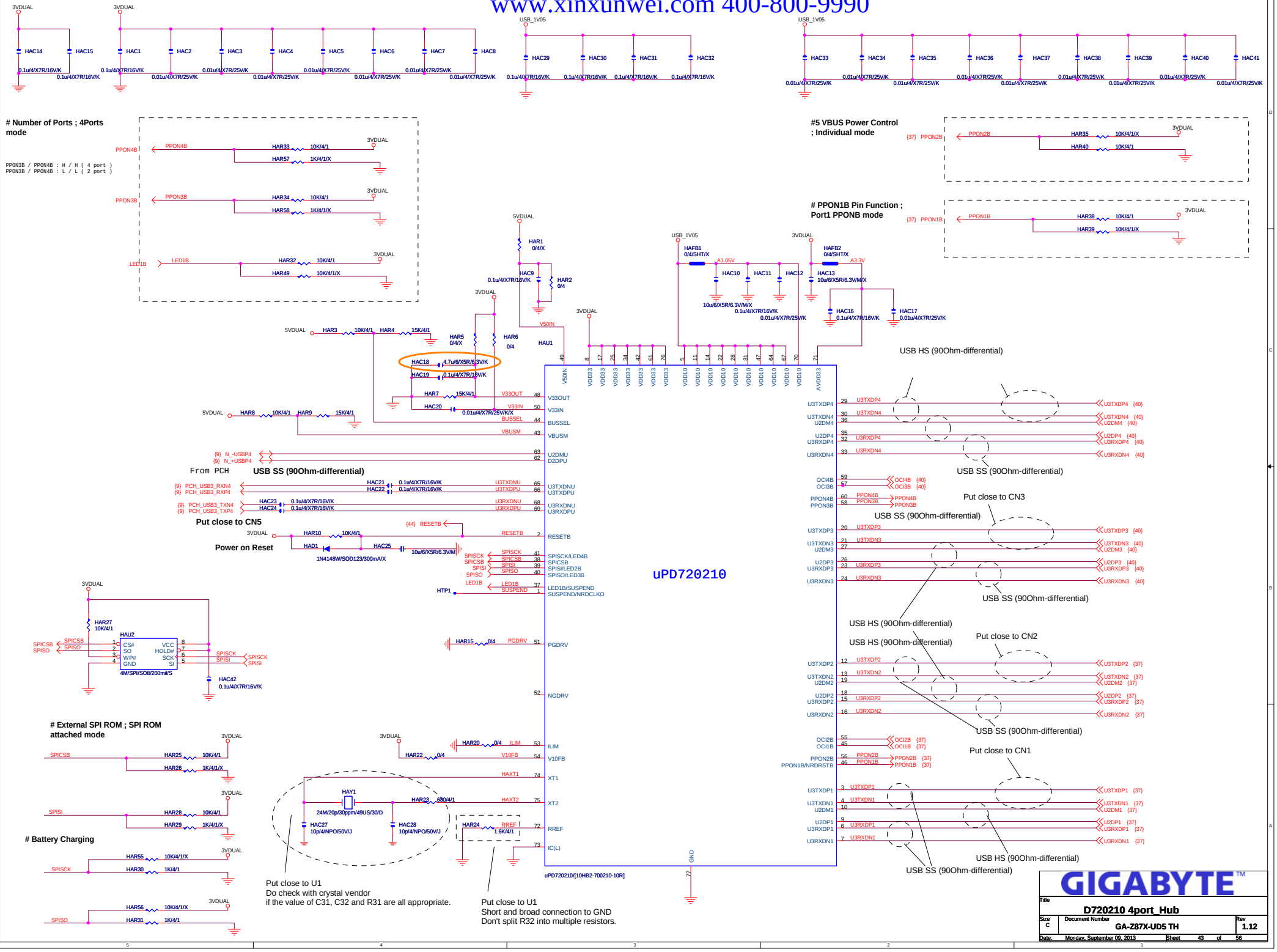
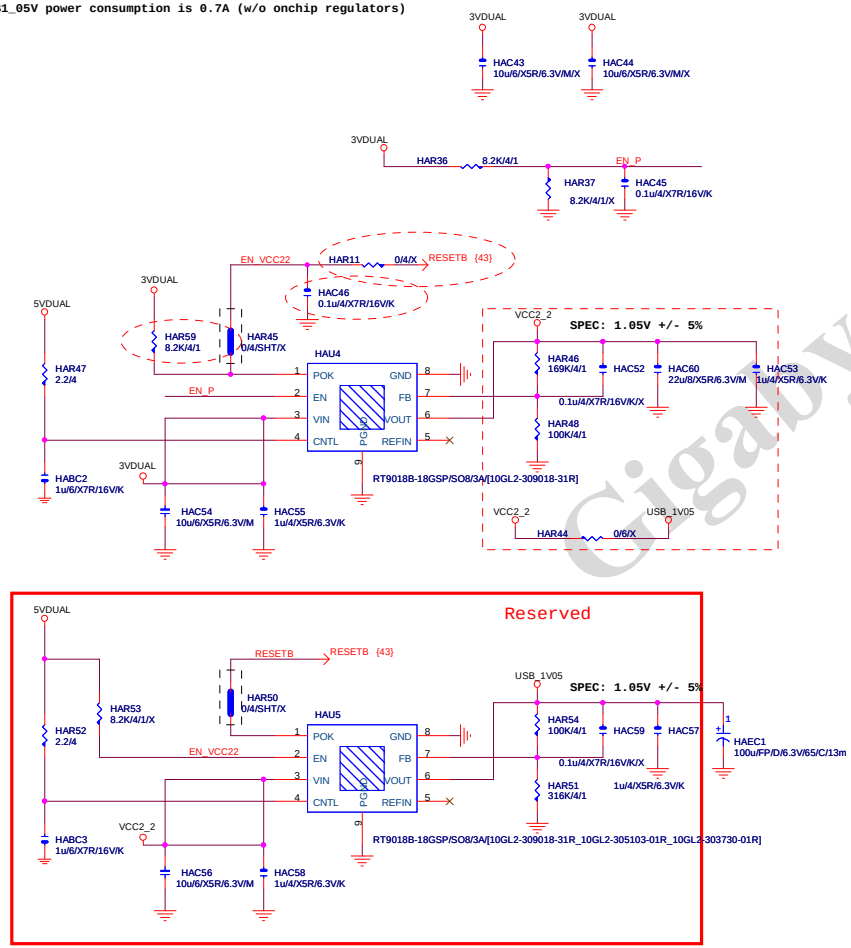
Title: RST, PWR, CLR_CMOS, OV		
Size: Custom	Document Number: GA-Z87X-UD5 TH	Rev: 1.12
Date: Monday, September 09, 2013	Sheet 42 of 56	



GIGABYTE™

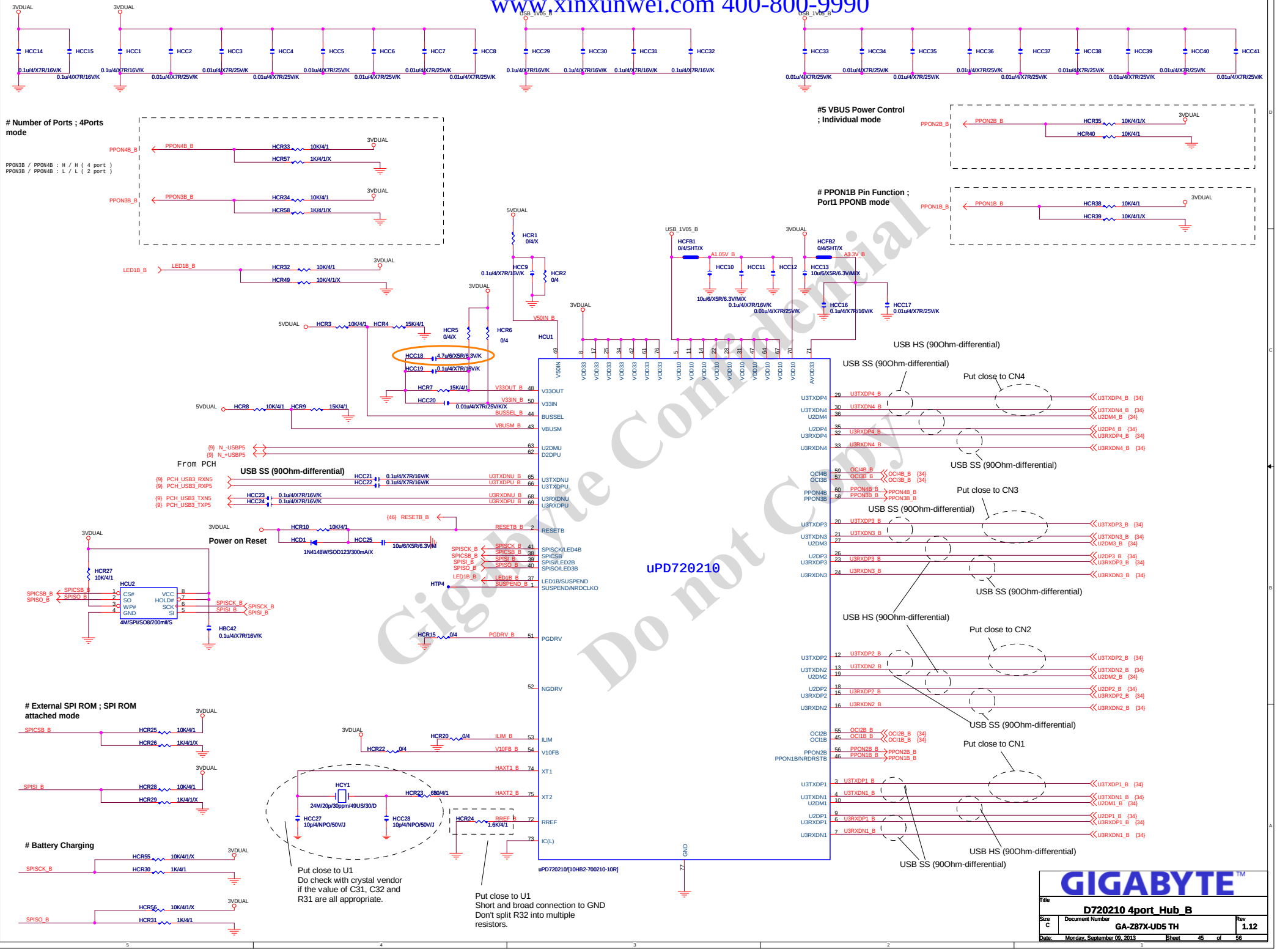
Title	D720210 4port_Hub	
Size: C	Document Number: GA-Z87X-UD5 TH	Rev: 1.12
Date: Monday, September 09, 2013	Sheet 43 of 56	

USB1_05V power consumption is 0.7A (w/o onchip regulators)



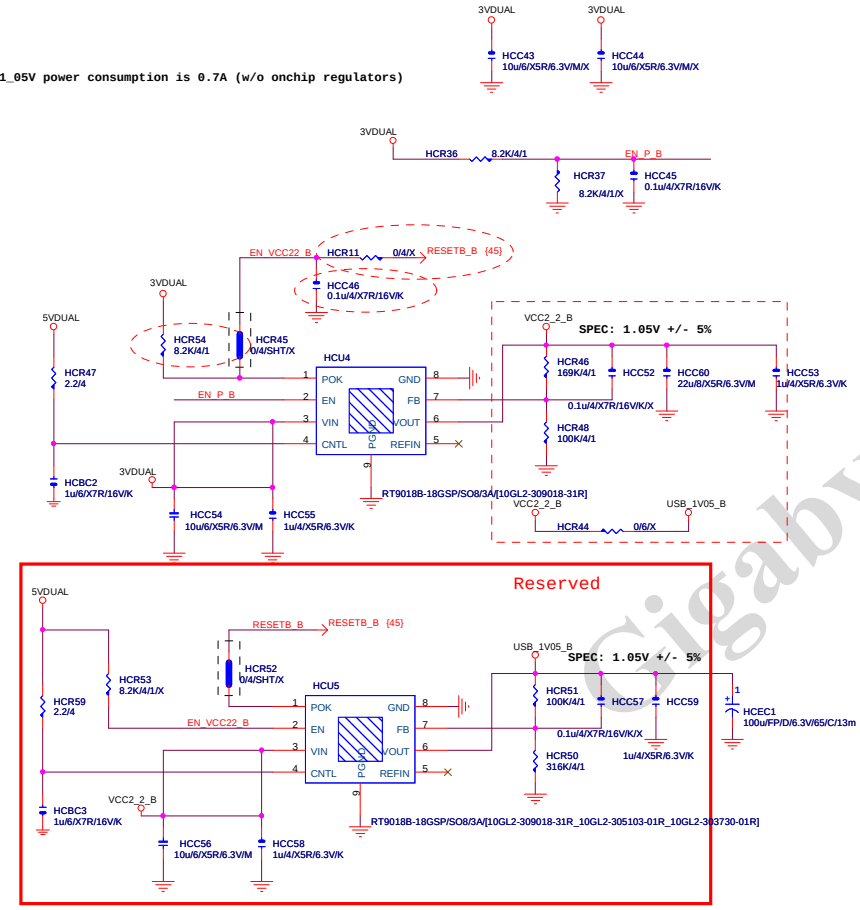
GIGABYTE™

Title	D720210 4port_Hub	
Size: Custom	Document Number: GA-Z87X-UD5 TH	Rev: 1.12
Date: Monday, September 09, 2013	Sheet 44 of 56	



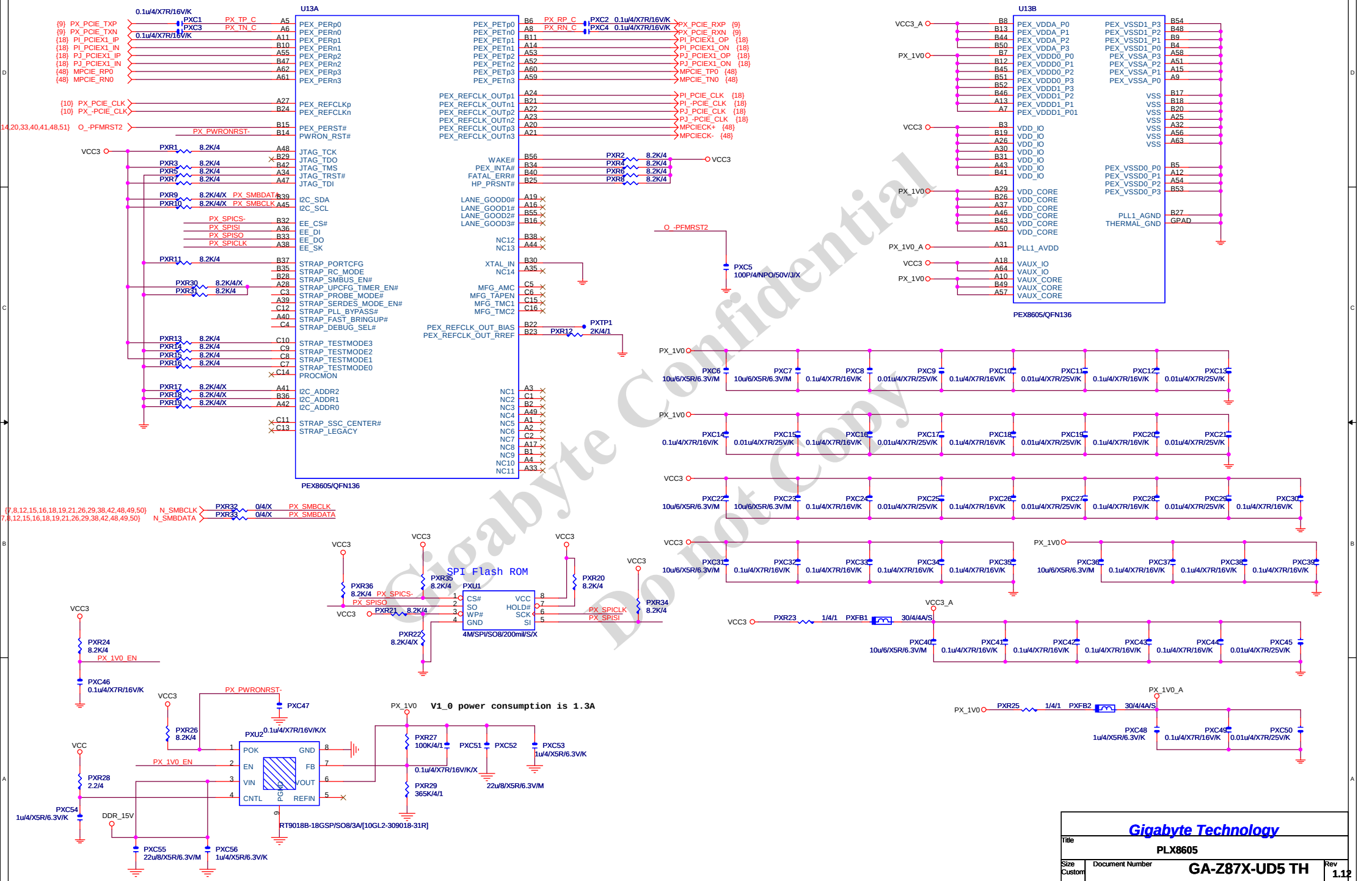
Title	D720210 4port_Hub_B	
Size: C	Document Number: GA-Z87X-UD5 TH	Rev: 1.12
Date: Monday, September 09, 2013	Sheet 45 of 56	

USB1_05V power consumption is 0.7A (w/o onchip regulators)

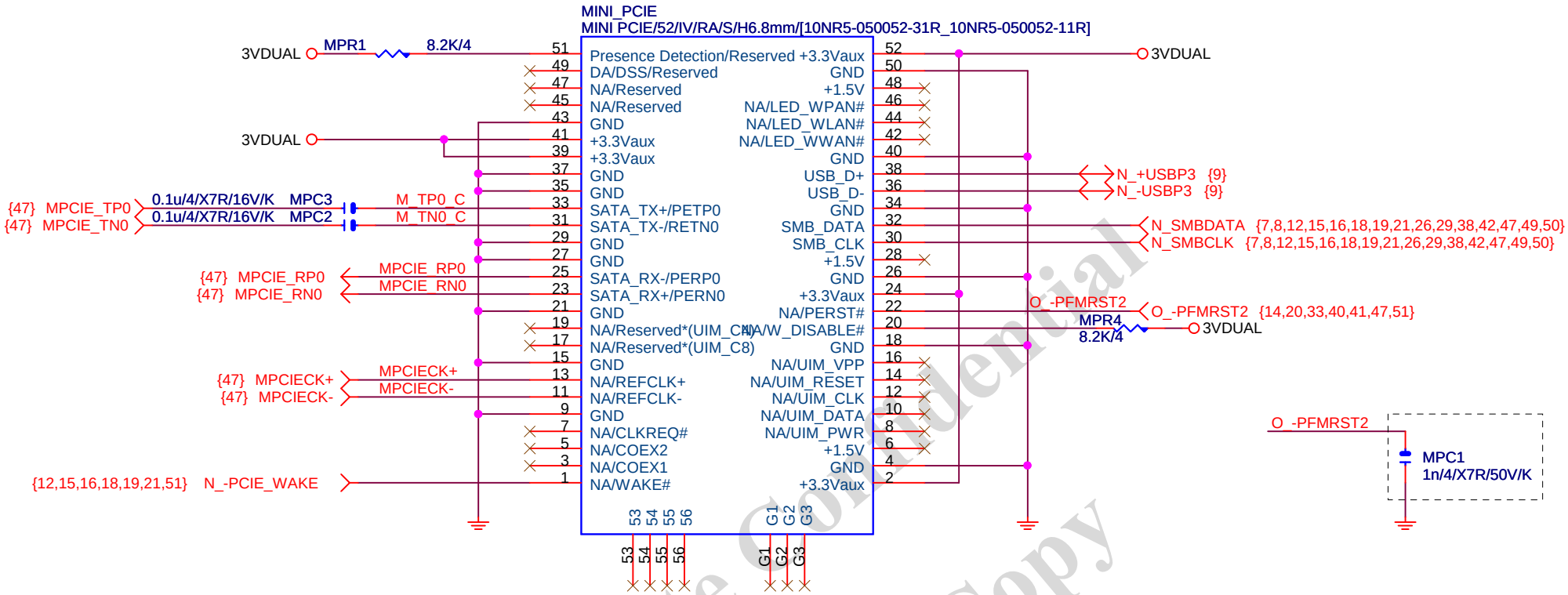


GIGABYTE™

Title	D720210 4port_Hub_B	
Size: Custom	Document Number: GA-Z87X-UD5 TH	Rev: 1.12
Date: Monday, September 09, 2013	Sheet 46 of 56	

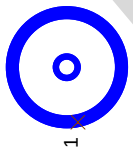


Gigabyte Technology			
Title	PLX8605		
Size: Custom	Document Number: GA-Z87X-UD5 TH		Rev: 1.12
Date: Monday, September 09, 2013	Sheet 47 of 56		

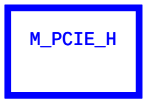


SCREW M2*4mm/[12KS2-010204-01R]

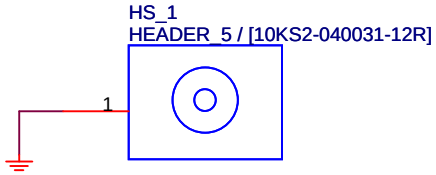
SMA/[11NH6-010001-21R]



ANTENNA_BRACKET
BRACKET/[12AC2-000001-01R]



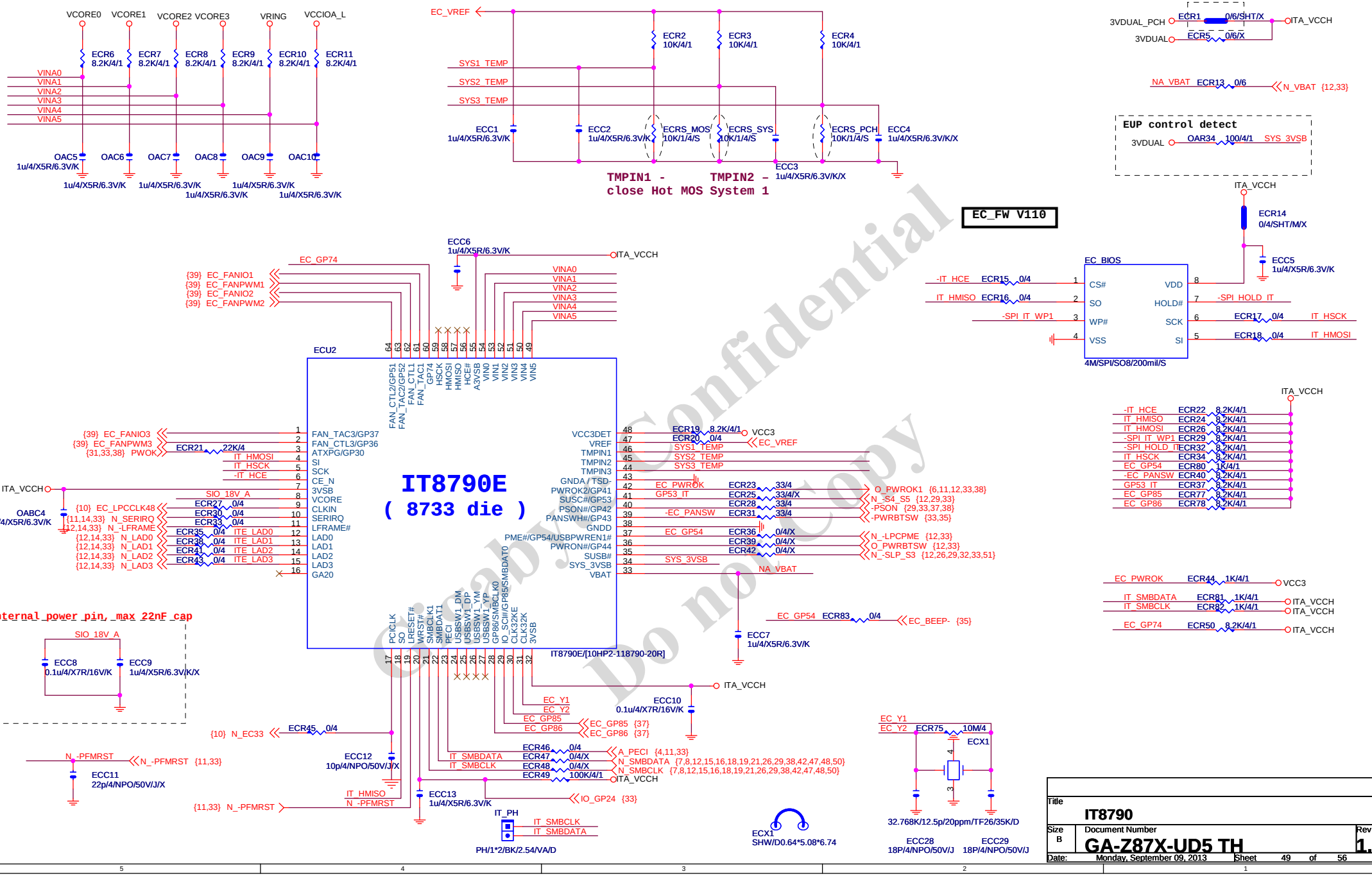
WIFI_MODULE
WI-FI WITH BT MINI CARD AZURWAVE/[20CB1-020123-00R]



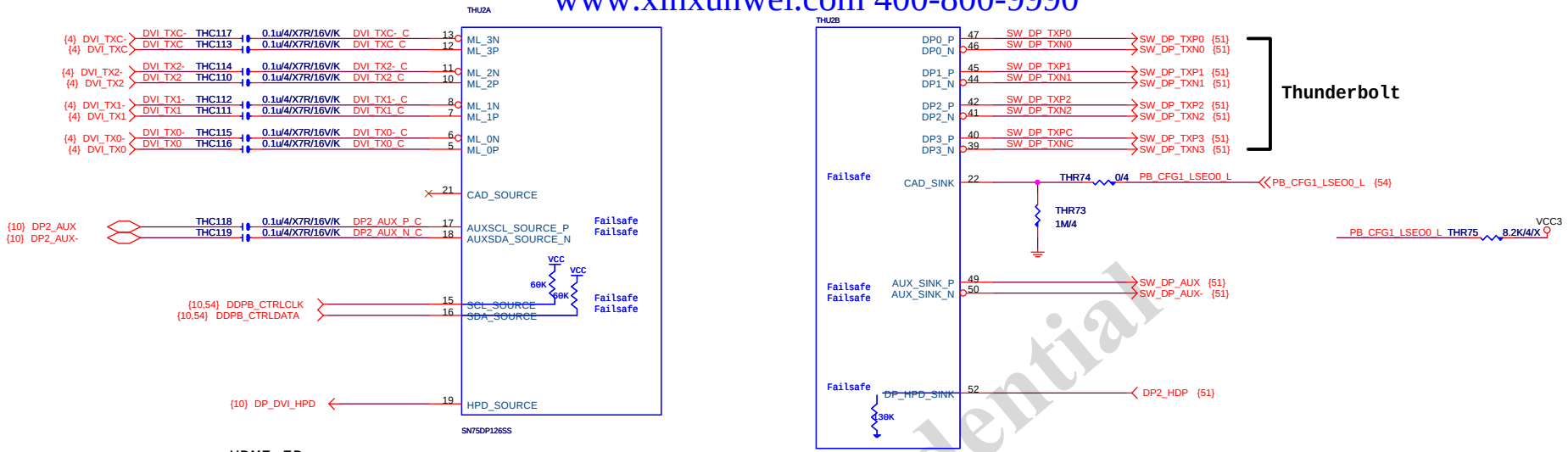
SMA/[11NH6-010001-21R]

GIGABYTE™

Title	mini PCIE slot	
Size A	Document Number GA-Z87X-UD5 TH	Rev 1.12
Date: Monday, September 09, 2013	Sheet 48 of 56	



Title	IT8790		
Size B	Document Number GA-Z87X-UD5 TH		Rev 1.12
Date: Monday, September 09, 2013	Sheet 49 of 56		



HDMI_ID
LOW: HDMI
HI: DVI

LOW: DP has Priority
HI: DVI has Priority

GIGABYTE™

Title	DP SWITCH TI SN75DP126SS	
Size: Custom	Document Number: GA-Z87X-UD5 TH	Rev: 1.12
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CIO0/1 ,TX/RX all swap ,firmware need modify

CIO differential 85 ohm

DP differential 100 ohm

PCIE differential 85 ohm

TU1E

CIO

DP

DSL4510/BGA/S

TB_FW RR4C_29

PCIe

TU1B
DSL4510/BGA/S

MISC

TU1A
DSL4510/BGA/S

SHORT ASAP 0.5%

0.8*R2 = (Vout -0.8)*R3

Buffer required due to following reasons:
1. Avoide leakage when RR is powered off.
2. Avoide glitches when RR power turns on/off.
Buffer must be with loff feature which disables the output, preventing damageing current backflow through the device when it is powered down.

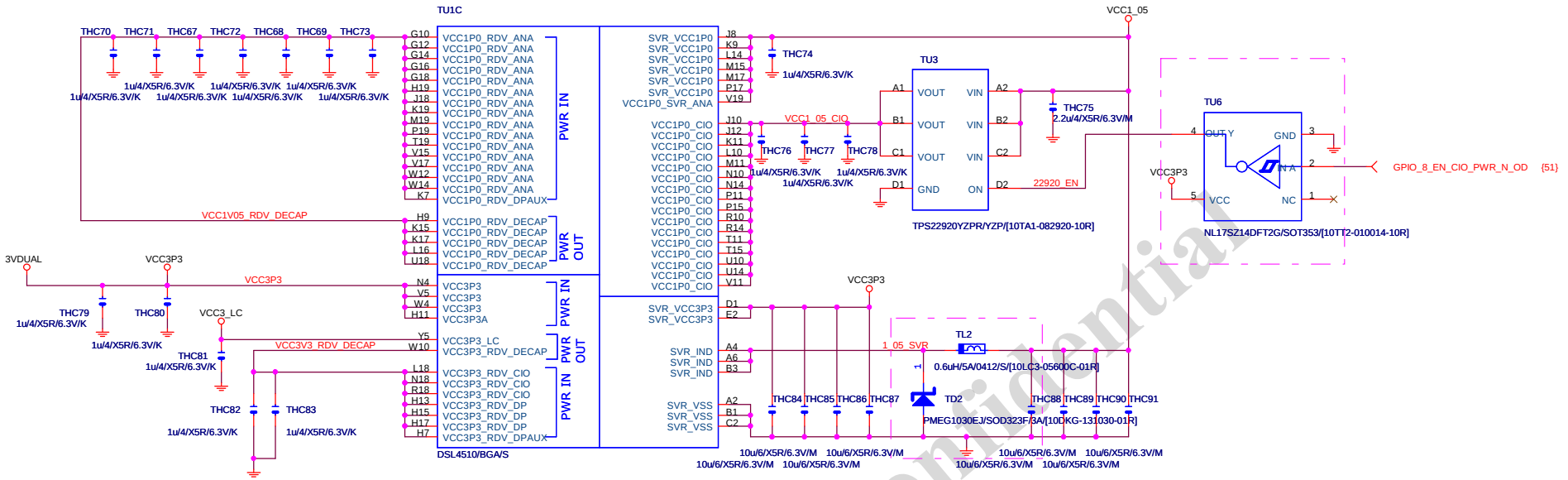
Close to TD4

GND

TU1D
DSL4510/BGA/S

GIGABYTE™

Title	RR CIO		
Size	Document Number		Rev
Custom	GA-Z87X-UD5 TH		1.12
Date: Monday, September 09, 2013	Sheet 51 of 56		

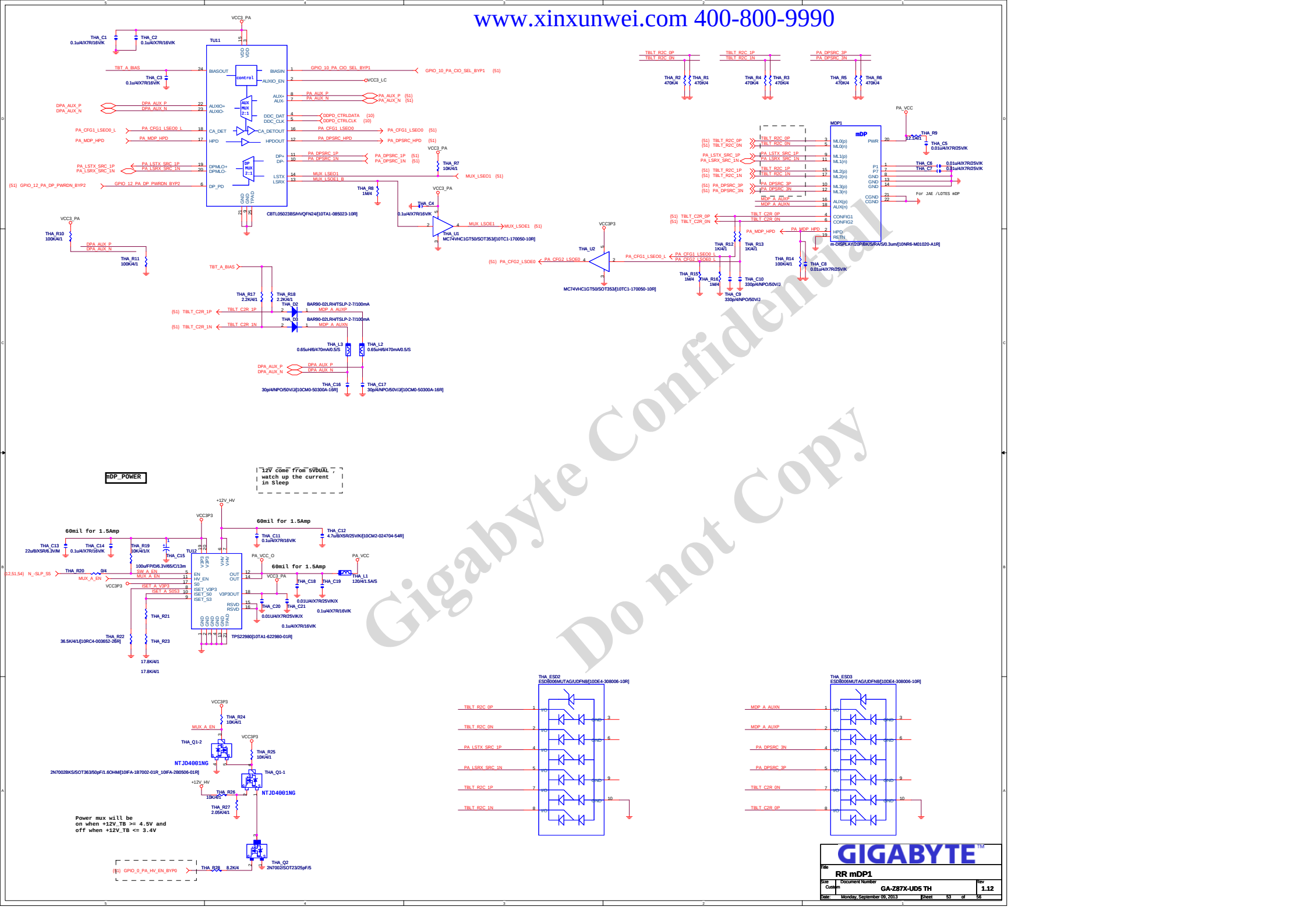


Power Consumption Table					
	3VDAUL	VCC3V3_RDV_DECAP	VCC1_05	VCC1V05_RDV_DECAP	VCC1_05_CIO
Max Current(A)	1.0 A	0.07 A	2.9 A	1.6 A	1.3 A

Sx Support Table			
	3VDUAL	PWR_ON_POC_RSTN (TU9.4)	Power Mux (TU12/22 .5)
S5	Off (optional)	Asserted	Off (EN=0)
Sx with wake support	On	Deasserted	On (EN=1)
Sx w/o wake support	Off (optional)*	Asserted*	Off (EN=0)*

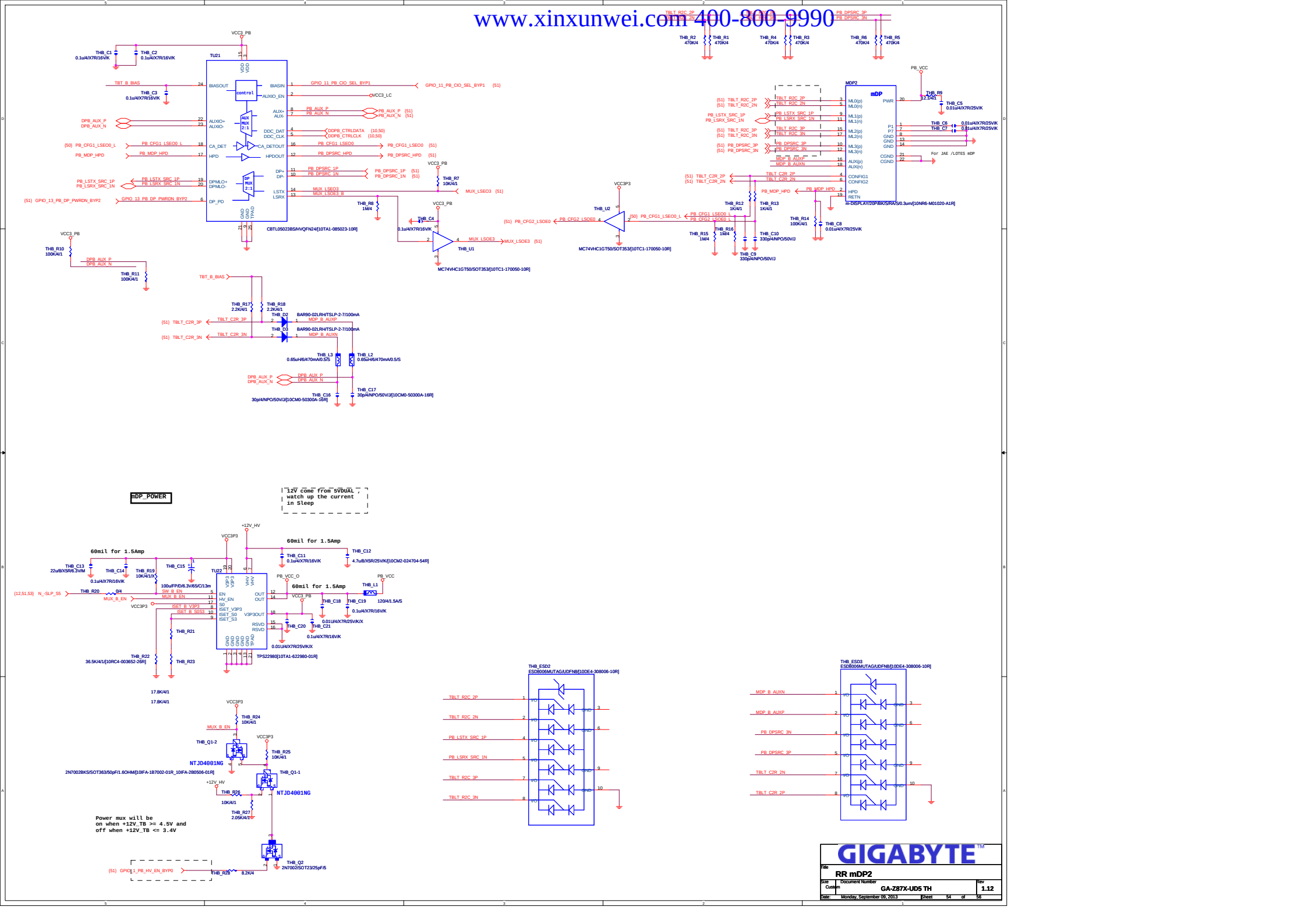
GIGABYTE™

Title: RR CIO PWR		
Size: Custom	Document Number: GA-Z87X-UD5 TH	Rev: 1.12
Date: Monday, September 09, 2013	Sheet 52 of 56	



GIGABYTE™

Title	RR mDP1	
Size: Custom	Document Number: GA-Z87X-UD5 TH	Rev: 1.12
Date: Monday, September 09, 2013	Sheet 53 of 56	

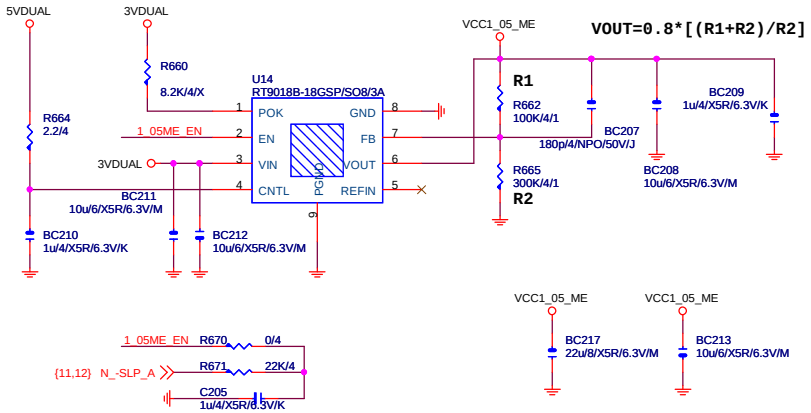


Title	RR mDP2		
Size	Document Number		Rev
Custom	GA-Z87X-UD5 TH		1.12
Date:	Monday, September 09, 2013	Sheet 54 of 56	

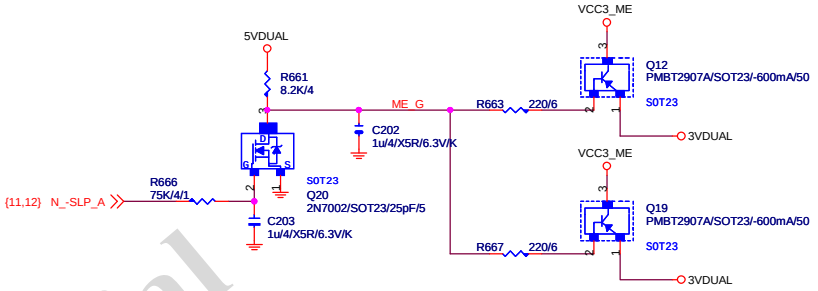
VCC1_05_ME

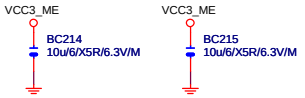
【技術通報R&D技術通報156】
(RICHTEK), (NUVOTON), (EMC)做共用
PIN7分壓阻值須做修改為100K以上電阻值

VOUT=0.8*[(R1+R2)/R2]



VCC3_ME





GIGABYTE™

Title: M3 POWER		
Size: Custom	Document Number: GA-Z87X-UD5 TH	Rev: 1.12
Date: Monday, September 09, 2013	Sheet 55 of 56	

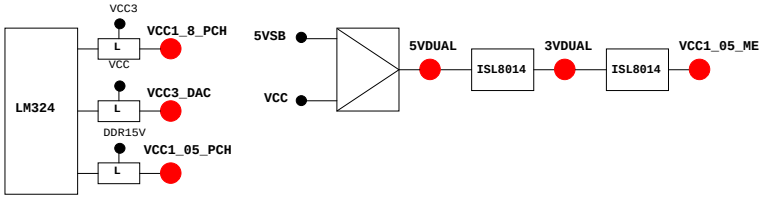
PCH GPIO LIST TABLE

PIN NAME	PWR	AFTER/PLTRST	Default	USAGE	NOTE
GP0	MAIN	H-Z	GPI	-PECI_REQ	N/A
GP1/TACH1	MAIN		GPI	ICH_FAN_TACH1	N/A
GP2/PIRQE#	MAIN		GPI	-PIRQE	P/U 8.2K VCC3
GP3/PIRQF#	MAIN		GPI	-PIRQF	P/U 8.2K VCC3
GP4/PIRQG#	MAIN		GPI	-PIRQG	P/U 8.2K VCC3
GP5/PIRQH#	MAIN		GPI	-PIRQH	P/U 8.2K VCC3
GP6/TACH2	MAIN		GPI	ICH_FAN_TACH2	N/A
GP7/TACH3	MAIN		GPI	ICH_FAN_TACH3	N/A
GP8	STBY	H	GPO	GPIO8	P/U 8.2K 3VDUAL
GP9/OC5#	STBY		NATIVE	OC5#	N/A
GP10/OC6#	STBY		NATIVE	OC6#	N/A
GP11/SMBALERT#	STBY		NATIVE	-SMBALERT	P/U 8.2K 3VDUAL
GP12	STBY	L	GPI	LAN_PHY_PWR_CTRL	P/U 8.2K 3VDUAL
GP13	STBY	L	GPI	GPIO13	P/U 8.2K 3VDUAL
GP14/OC7#	STBY		NATIVE	OC7#	N/A
GP15	STBY	L	GPO	GPIO15	N/A
GP16	MAIN		GPI	-SKTOCC	P/U 8.2K VCC3
GP17/TACH0	MAIN		GPI	ICH_FAN_TACH0	N/A
GP18	MAIN		NATIVE	MB_ID0	P/D 8.2K GND
GP19	MAIN		GPI	-LAN1_ISO	P/U 8.2K VCC3
GP20	MAIN		NATIVE	LED_CTL	P/U 1K VCC3
GP21	MAIN		GPI	VCC18_PCH_OV2	P/U 8.2K VCC3
GP22	MAIN	H-Z	GPI	VCORE_OV3	P/U 8.2K VCC3
GP23	MAIN		NATIVE	-LDRQ1	P/U 8.2K VCC3
GP24	STBY	L	GPO	TLS	P/U 8.2K 3VDUAL
GP25	STBY		NATIVE	-CPU_STOP	P/U 8.2K 3VDUAL
GP26	STBY		NATIVE	-ACZ_DET	P/U 8.2K 3VDUAL
GP27	STBY	H	GPO	GPIO27	P/U 8.2K 3VDUAL
GP28	STBY	H	GPO	GPIO28	P/U 8.2K 3VDUAL
GP29	STBY	L	GPI	GPIO29	N/A
GP30	STBY	H-Z	GPI	S_PWR_ACK	P/U 100K 3VDUAL
GP31	STBY	H-Z	GPI	N/A(Reverse)	P/U 8.2K VCC3
GP32	MAIN	H	GPO	MB_ID1	P/D 8.2K GND
GP33	MAIN	H	GPO	LOAD-LINE	P/U 1K VCC3
GP34	MAIN	H-Z	GPI	-PCI_STOP	P/U 8.2K VCC3
GP35	MAIN	L	GPO	GPIO35	P/U 8.2K VCC3
GP36	MAIN		GPI	-LAN1_DSM	P/U 8.2K VCC3
GP37	MAIN		GPI	N/A	P/U 8.2K VCC3
GP38	MAIN	H-Z	GPI	VCORE_OV2	P/U 8.2K VCC3
GP39	MAIN	H-Z	GPI	-LAN_DSM	P/U 8.2K VCC3
GP40	STBY		NATIVE	OC1#	N/A
GP41	STBY		NATIVE	OC2#	N/A
GP42	STBY		NATIVE	OC3#	N/A
GP43	STBY		NATIVE	OC4#	N/A
GP44	STBY	L	NATIVE	N/A	P/U 8.2K 3VDUAL
GP45	STBY		NATIVE	-LPCPME	P/U 8.2K 3VDUAL
GP46	STBY	L	NATIVE	PWR_LED	P/U 8.2K 3VDUAL
GP47	STBY		NATIVE	PSI LED	P/U 8.2K 3VDUAL
GP48	MAIN	H-Z	IN	EN_PWM	P/U 8.2K VCC3
GP49	MAIN	H-Z	IN	VCC18_OV1	P/U 8.2K VCC3
GP50	MAIN		NATIVE	-REQ1	P/U 2.2K VCC
GP51	MAIN	H	NATIVE	-GNT1	N/A
GP52	MAIN		NATIVE	-REQ2	P/U 2.2K VCC
GP53	MAIN	H	NATIVE	-GNT2	N/A
GP54	MAIN		NATIVE	-REQ3	P/U 2.2K VCC
GP55	MAIN	H	NATIVE	-GNT3	N/A
GP56	STBY		NATIVE	N/A(Reverse)	P/U 8.2K 3VDUAL
GP57	STBY	H-Z	IN	VCORE_OV1	P/U 8.2K 3VDUAL
GP58	STBY	H-Z	NATIVE	F_USB_OC	P/U 8.2K 3VDUAL
GP59	STBY		NATIVE	USB_OC0#	N/A
GP60	STBY	H-Z	NATIVE	N/A(Reverse)	P/U 8.2K 3VDUAL
GP61	STBY	L	NATIVE	-SUSTAT	N/A
GP62	STBY	L	NATIVE	SUSCLK	N/A
GP63	STBY	L	NATIVE	GPIO63	N/A
GP64	MAIN	L	NATIVE	CLKOUTFLEX0	N/A
GP65	MAIN	L	NATIVE	CLKOUTFLEX1	N/A
GP66	MAIN	L	NATIVE	CLKOUTFLEX2	N/A
GP67	MAIN	L	NATIVE	CLKOUTFLEX3	N/A
GP72	STBY	H-Z	NATIVE	VCORE_OV4	P/U 8.2K 3VDUAL
GP73	STBY		NATIVE	1_05V_OV1	P/U 8.2K 3VDUAL
GP74	STBY	H-Z	NATIVE	1_05V_OV2	P/U 8.2K 3VDUAL
GP75	STBY	H-Z	NATIVE	N/A(Reverse)	P/U 8.2K 3VDUAL

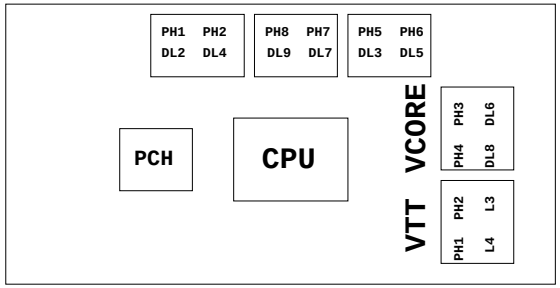
Super I/O ITE8720 GPIO Table

PIN NAME	USAGE	NOTE
SVC/PECI_RQT/GP14	-PECI_REQ	
PWROK1/GP13	PWROK1/ITE_PWROK	
KRST#/GP62	-KBRST	
SO/GP50	-ICH_SPI_CS	
IRTX/GP47/CE2_N/JP7	CEB_N	
GP46/IRRX	-LAN2_DSM	
PSION#/GP42	-PSON	
PWROK2#/GP41	PECI_CTL	
PCIRST3#/GP10/VDIMM_STR_EN	-PCIE_RST	
RSMRST#CIRRX1/GP55	-RSMRST	
PME#/GP54	-LPCPME	
PD5/GP75/BUSSO0	N/A	

PIN NAME	USAGE	NOTE
FAN_TAC2/GP52	FANIO2	
FAN_TAC3/GP37	FANIO3	
VIDO3/FAN_TAC4/GP25/DSR2#	FANIO4	
FAN_CTL2/GP51	FANPWM2	
FAN_CTL3/GP36	FANPWM3	
VID4/GP34	BEEP-	
VID3/GP33	TURBO1	
VID2/GP32	TURBO0	
VCORE_GOOD/VID6/GP63	CPUT_LED1_C	
VID5/GP35	CPUT_LED2_C	
VID1/GP31	CPUT_LED3_C	
VID0/GP30	-LAN1_DSM	NBT_LED1_C
SLCT/GP80	CPU_LED1_C	
PE/GP81	CPU_LED2_C	
BUSY/GP82	CPU_LED3_C	
PD3/GP73/BUSSI1	SB_LED1_C	
PD4/GP74/BUSSI2	SB_LED2_C	
VCORE_EN/VID7/GP64	IT_GP64	SB_LED3_C
PD0/GP70	NB_LED1_C	
PD1/GP71	NB_LED2_C	
PD2/GP72/BUSSI0	NB_LED3_C	
GP22/SCK	LOW_PWR_1	
VIDO5/GP27/SIN2	LOW_PWR_2	
PCIRST2#/GP11	-PFMRST1	
PCIRST1#/GP12	-PFMRST2	
3VSBSW#/GP40	CSI_F0	BSEL166_1
SUSC#/GP53	CSI_F1	BSEL166_2
GP23/SI	BSEL166_3/CSISBSL	
VIDO0/GP20/CTS2#	CPUT_LED1_C	BSEL166_4
GP65/VDDA_EN/GB_01	MB_ID2	
PD6/GP76/BUSSO1	MB_ID3	
PD7/GP77/BUSSO2	MB_ID4	
AFD#/GP86/SMBC_R	空 PIN	FST_2X8
INIT#/GP85/SMBD_M	SEC_2x8	GTLREF_AD2
ACK#/GP83	DDR_LED1_C	
VIDO1/GP21/DCD2#	DDR_LED2_C	
STB#/GP87/SMBC_M	DDR_LED3_C	
PWRON#GP44	VCORE_OV1	
PANSWH#/GP43	PWRBTSW	
KDAT/GP61	-PWRBTSW	
KCLK/GP60	KDAT	
MDAT/GP57	KCLK	
MACL/GP56	MDAT	
GP66/VLDT_EN/GB_02	NBT_LED1_C	MCLK
SVD/PCIRSTIN#/CIRTX/GP15	PWM2_CR	
KDAT/GP61	PWM2_CR	
GP67/CPU_PG/GB_03	EN_LOADLINE	IT_GP67/-EN_PWM2
SLIN#/GP84/SMBD_R	-EN_PWM2	
PSI_L/FAN_CLT5/CIRRX2/GP16	-THERM	
VIDO4/GP26/SOUT2	DDR18V_PH2_EN	
VIDO2/FAN_TAC5/GP24/DSR2#	DDR18V_LED	
VIDO6/GP17/RI2#	1_1V_PH_EN	
VIDO7/JP6/DTR2#	JP6	
PD5/GP75/BUSSO0	SB_LED3_C	



PWM各相位的擺法如下：



BIOS超電壓對應表：

線路圖名稱	BIOS選項
Vcore	CPU Vcore
CPU_VTT	CPU Termination
CPU_VAXG	CPU Graphic Core
VCC1_8_PCH	CPU PLL
VCC1_05_PCH	PCH core
3VDUAL	3VDUAL
DDR15V	DRAM voltage
DDRVTT	DRAM Terminatio
VREF_CA_A/VREF_CA_B	DRAM Address Ref
VREF_DQ_A/VREF_DQ_B	DRAM Data Ref

散熱模組料號：

8IBP:
1.12SP2-01A001-Y1R/Y2R
2.12SP2-01A001-Z1R/Z2R
(HIBRID模組)包材階

	3 pin FAN control	4 pin FAN control	FAN speed	Controller
CPU FAN	FANPWM1	FANPWM3	FANIO1	IT8720
	ICH_FAN_PWM2	ICH_FAN_PWM0	ICH_FAN_TACH0	PCH
SYS FAN	FANPWM2	N/A	FANIO2	IT8720
	ICH_FAN_PWM1	N/A	ICH_FAN_TACH1	PCH
PWR FAN	N/A	N/A	FANIO3	IT8720
			ICH_FAN_TACH2	PCH

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Title: TABLE LIST

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