

Model Name: GA-P61-USB3-B3

1.01

SHEET

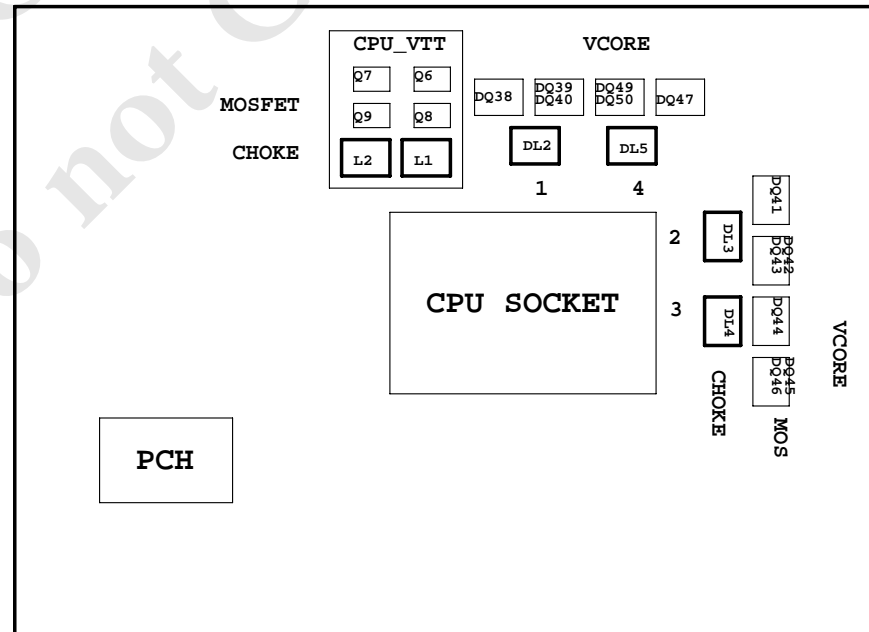
TITLE

01	COVER SHEET
02	BOM & PCB MODIFY HISTORY
03	BLOCK DIAGRAM
04	CPU_LGA1155-A
05	CPU_LGA1155-B
06	CPU_LGA1155-C
07	DDR III CHANNEL A
08	DDR III CHANNEL B
09	PCH_FDI,DMI,USB,PCIE,NVRAM
10	PCH_DP,CLK BUFFER
11	PCH_HOST,SATA,PCI
12	PCH_GPIO,CTRL,AUDIO
13	PCH_PWR,GND
14	PCI EXPRESS*16 SLOT
15	PCI EXPRESS*4 SLOT
16	PCI EXPRESS*1 SLOTS X2
17	PCI SLOT 1&2&3
18	I/O ITE8728
19	COM, -PROHOT, ESATA CONNECT
20	Dual BIOS
21	ALC892
22	REAR AUDIO JACK
23	VCORE PWM_ISL6364CRZ-1
24	VCORE PWM_ISL6364CRZ-2
25	DISCRETE POWER
26	DDR_15V & VCC1_05_PCH PWM_ISL6545CBZ
27	CPU_VTT PWM_ISL6322G

SHEET

TITLE

28	VCCSA POWER
29	F_PANEL , F_USB
30	ATX POWER, CLOCK GEN
31	HWM,KB/MS , FAN CTRL
32	REALTEK RTL8111E
33	NEC USB3.0
34	TABLE LIST
35	
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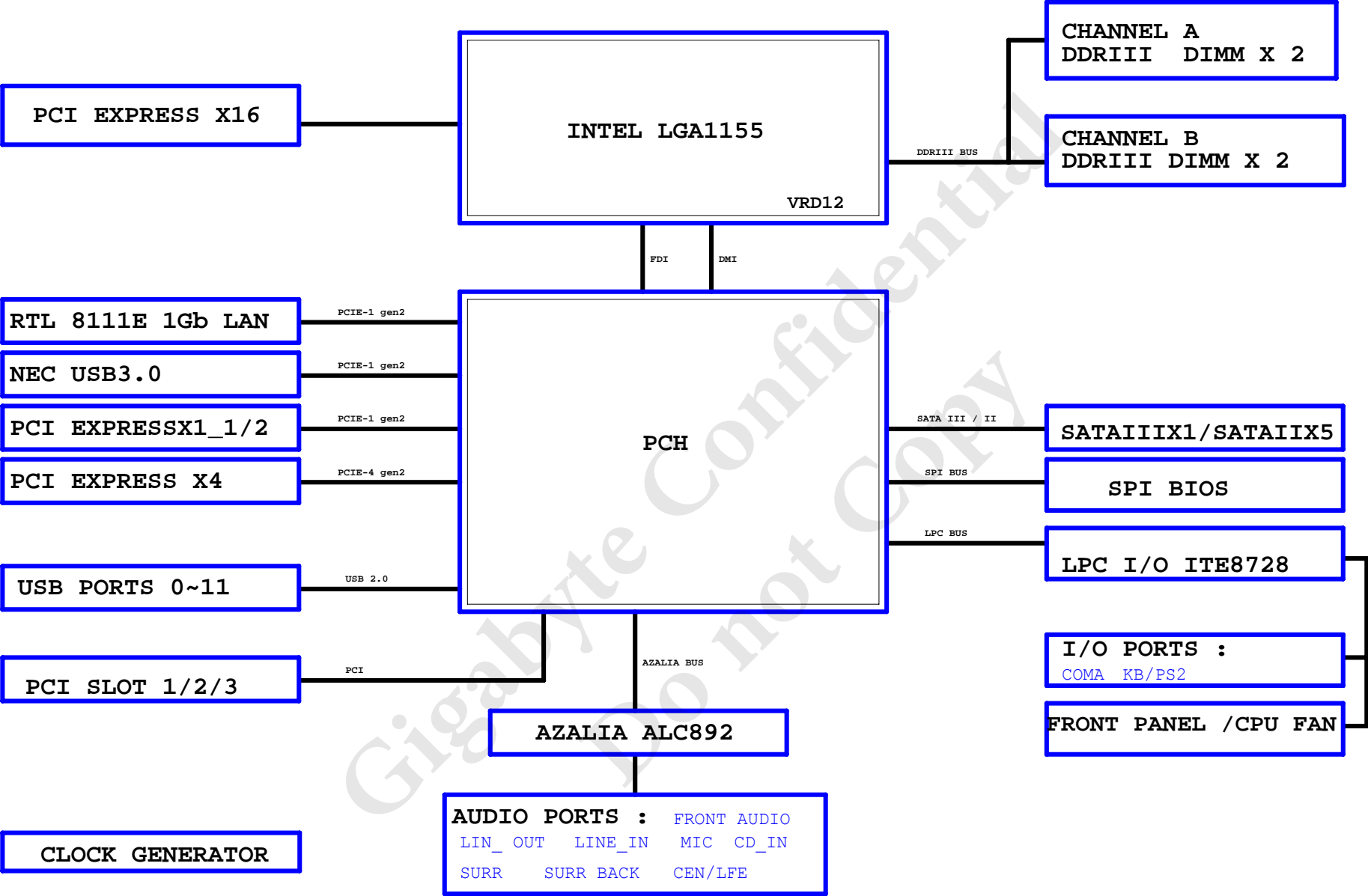


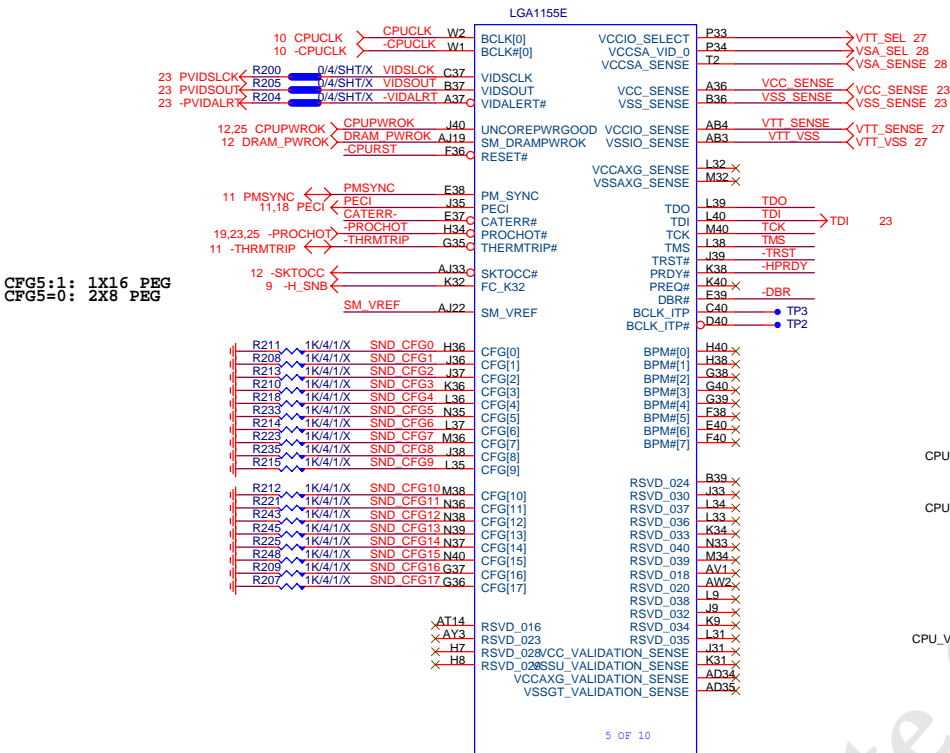
Gigabyte Technology

Title		Cover Sheet	
Size	Document Number	GA-P61-USB3-B3	Rev
Custom			1.01
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[illegible]

BLOCK DIAGRAM

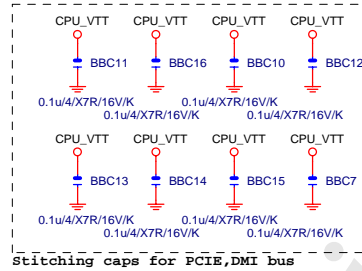
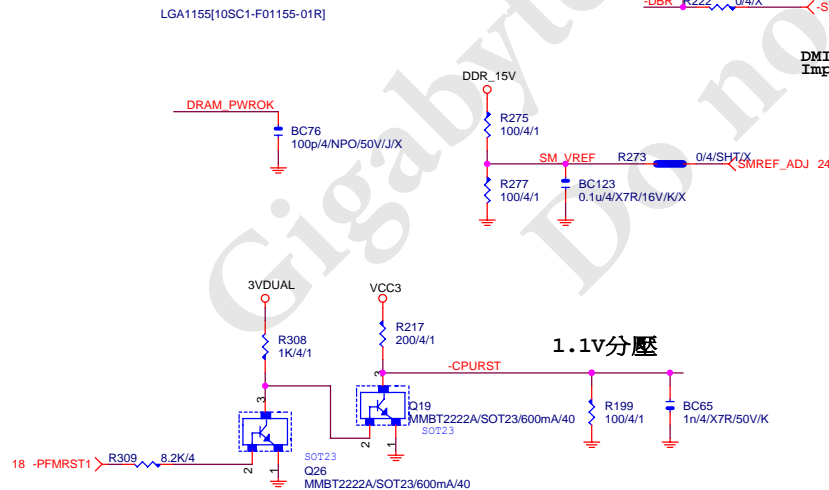




CFG	H	L	NOTE
0	RSVD	RSVD	RSVD
1	RSVD	RSVD	RSVD
2	NORM	Reverse	LANE REVERSAL(0),x16
3	RSVD	RSVD	RSVD
4	RSVD	RSVD	RSVD
7	RSVD	RSVD	RSVD
8	RSVD	RSVD	RSVD
9	RSVD	RSVD	RSVD
10	RSVD	RSVD	RSVD
11	RSVD	RSVD	RSVD
12	RSVD	RSVD	RSVD
13	RSVD	RSVD	RSVD
14	RSVD	RSVD	RSVD
15	RSVD	RSVD	RSVD
16	RSVD	RSVD	RSVD
17	RSVD	RSVD	RSVD

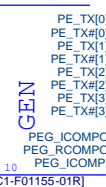
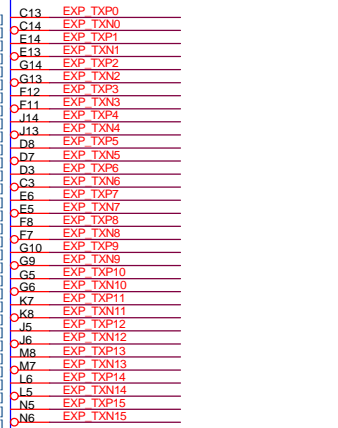
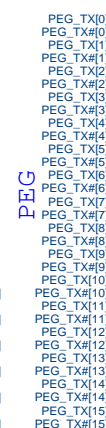
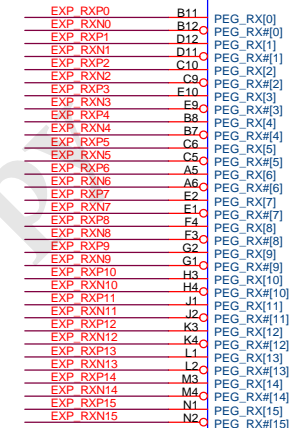
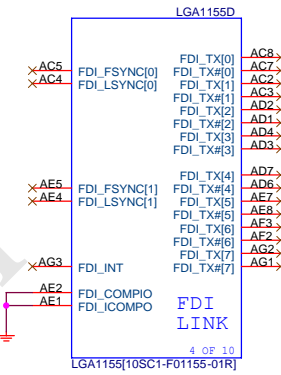
CFG6	CFG5	PCIE CONFIG
1	1	1x16, Default
1	0	2x8
0	1	RSVD
0	0	8x, 4x, 4x

CFG 0-17 all internal PULL-UP



PCIE16:16/5/5/5/16(breakout min 10/4/4/4/10)
Impedance=80 +/- 17.5%

DMI:12/4/5/4/12(breakout min 8/4/4/4/8)
Impedance=85 +/- 17.5%



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Title	CPU LGA1156-A	
Size	Document Number	Rev
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LGA1155A

MAAA0	AV27	SA_MA[0]	SA_DQS[0]	AK3	DQSA0
MAAA1	AY24	SA_MA[1]	SA_DQS[0]	AK2	-DQSA0
MAAA2	AW24	SA_MA[2]			
MAAA3	AW23	SA_MA[3]			
MAAA4	AV23	SA_MA[4]	SA_DQ[0]	AJ3	MDA0
MAAA5	AT24	SA_MA[5]	SA_DQ[1]	AJ4	MDA1
MAAA6	AT23	SA_MA[6]	SA_DQ[2]	AL3	MDA2
MAAA7	AU22	SA_MA[7]	SA_DQ[3]	AL4	MDA3
MAAA8	AV22	SA_MA[8]	AJ2	MDA4	
MAAA9	AT22	SA_MA[9]	AJ1	MDA5	
MAAA10	AV28	SA_MA[10]	SA_DQ[6]	AL2	MDA6
MAAA11	AU21	SA_MA[11]	SA_DQ[7]	AL1	MDA7
MAAA12	AT21	SA_MA[12]			
MAAA13	AW32	SA_MA[13]	SA_DQS[1]	AP3	DQSA1
MAAA14	AU20	SA_MA[14]	SA_DQS[1]	AP2	-DQSA1
MAAA15	AT20	SA_MA[15]			
7 -SWEA	AW29	SA_WE#	SA_DQ[8]	AN1	MDA8
7 -SCASA	AV30	SA_CAS#	SA_DQ[9]	AN4	MDA9
7 -SRASA	AU28	SA_RAS#	SA_DQ[10]	AR3	MDA10
			SA_DQ[11]	AR4	MDA11
7 SBAA0	AY29	SA_BS[0]	SA_DQ[12]	AN2	MDA12
7 SBAA1	AW28	SA_BS[1]	SA_DQ[13]	AN3	MDA13
7 SBAA2	AV20	SA_BS[2]	SA_DQ[14]	AR2	MDA14
			SA_DQ[15]	AR1	MDA15
7 -CSA0	AY29	SA_CS#	SA_DQS[2]	AW4	DQSA2
7 -CSA1	AV32	SA_CS#	SA_DQS[2]	AV4	-DQSA2
	AW30	SA_CS#	SA_DQS[2]		
	AW33	SA_CS#			
7 CKEA0	AV19	SA_CKE[0]	SA_DQ[16]	AV2	MDA16
7 CKEA1	AT19	SA_CKE[1]	SA_DQ[17]	AW3	MDA17
	AU18	SA_CKE[2]	SA_DQ[18]	AV5	MDA18
	AV18	SA_CKE[3]	SA_DQ[19]	AV5	MDA19
			SA_DQ[20]	AU2	MDA20
MODT_A0	AV31	SA_ODT[0]	SA_DQ[21]	AU3	MDA21
MODT_A1	AU32	SA_ODT[1]	SA_DQ[22]	AY5	MDA22
	AU30	SA_ODT[2]	SA_DQ[23]	AY5	MDA23
	AW33	SA_ODT[3]			
7 DCLKA0	AY25	SA_CLK[0]	SA_DQS[3]	AV8	DQSA3
7 -DCLKA0	AW25	SA_CLK[0]	SA_DQS[3]	AW8	-DQSA3
7 DCLKA1	AU24	SA_CLK[1]			
7 -DCLKA1	AW25	SA_CLK[1]	SA_DQ[24]	AY7	MDA24
	AW27	SA_CLK[2]	SA_DQ[25]	AU7	MDA25
	AY27	SA_CLK[2]	SA_DQ[26]	AV9	MDA26
	AV26	SA_CLK[3]	SA_DQ[27]	AU9	MDA27
	AW26	SA_CLK[3]	SA_DQ[28]	AV7	MDA28
	AW26	SA_CLK[3]	SA_DQ[29]	AW7	MDA29
			SA_DQ[30]	AW9	MDA30
			SA_DQ[31]	AY9	MDA31
			SA_DQS[4]	AV37	DQSA4
			SA_DQS[4]	AV36	-DQSA4
			SA_DQ[32]	AU35	MDA32
			SA_DQ[33]	AW37	MDA33
			SA_DQ[34]	AU39	MDA34
			SA_DQ[35]	AU36	MDA35
			SA_DQ[36]	AW35	MDA36
			SA_DQ[37]	AY36	MDA37
			SA_DQ[38]	AU38	MDA38
			SA_DQ[39]	AU37	MDA39
			SA_DQS[5]	AP38	DQSA5
			SA_DQS[5]	AP39	-DQSA5
			SA_DQ[40]	AR40	MDA40
			SA_DQ[41]	AR37	MDA41
			SA_DQ[42]	AN38	MDA42
			SA_DQ[43]	AN37	MDA43
			SA_DQ[44]	AR39	MDA44
			SA_DQ[45]	AR38	MDA45
			SA_DQ[46]	AN38	MDA46
			SA_DQ[47]	AN40	MDA47
			SA_DQS[6]	AK38	DQSA6
			SA_DQS[6]	AK39	-DQSA6
			SA_DQ[48]	AL40	MDA48
			SA_DQ[49]	AL37	MDA49
			SA_DQ[50]	AJ38	MDA50
			SA_DQ[51]	AJ37	MDA51
			SA_DQ[52]	AL39	MDA52
			SA_DQ[53]	AL38	MDA53
			SA_DQ[54]	AJ39	MDA54
			SA_DQ[55]	AJ40	MDA55
			SA_DQS[7]	AF38	DQSA7
			SA_DQS[7]	AF39	-DQSA7
			SA_DQ[56]	AG40	MDA56
			SA_DQ[57]	AG37	MDA57
			SA_DQ[58]	AE38	MDA58
			SA_DQ[59]	AE37	MDA59
			SA_DQ[60]	AG39	MDA60
			SA_DQ[61]	AG38	MDA61
			SA_DQ[62]	AE39	MDA62
			SA_DQ[63]	AE40	MDA63

DDR_0

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LGA1155[10SC1-F01155-01R]

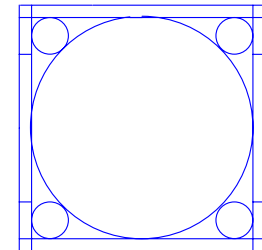
LGA1155B

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MAAB2	AM19	SB_MA[2]			
MAAB3	AK18	SB_MA[3]			
MAAB4	AP19	SB_MA[4]	SB_DQ[0]	AG7	MDB0
MAAB5	AP18	SB_MA[5]	SB_DQ[1]	AG8	MDB1
MAAB6	AM18	SB_MA[6]	SB_DQ[2]	AJ9	MDB2
MAAB7	AL18	SB_MA[7]	SB_DQ[3]	AJ8	MDB3
MAAB8	AN18	SB_MA[8]	SB_DQ[4]	AG5	MDB4
MAAB9	AY17	SB_MA[9]	SB_DQ[5]	AG6	MDB5
MAAB10	AN23	SB_MA[10]	SB_DQ[6]	AJ6	MDB6
MAAB11	AU17	SB_MA[11]	SB_DQ[7]	AJ7	MDB7
MAAB12	AR26	SB_MA[12]			
MAAB13	AR26	SB_MA[13]	SB_DQS[1]	AM8	DQSB1
MAAB14	AY16	SB_MA[14]	SB_DQS[1]	AL8	-DQSB1
MAAB15	AV16	SB_MA[15]			
8 -SWEB	AR25	SB_WE#	SB_DQ[8]	AL7	MDB8
8 -SCASB	AK25	SB_CAS#	SB_DQ[9]	AM7	MDB9
8 -SRASB	AP24	SB_RAS#	SB_DQ[10]	AM10	MDB10
			SB_DQ[11]	AL10	MDB11
8 SBAB0	SBAB0	SB_BS[0]	SB_DQ[12]	AL6	MDB12
8 SBAB1	SBAB1	SB_BS[1]	SB_DQ[13]	AL9	MDB14
8 SBAB2	SBAB2	SB_BS[2]	SB_DQ[14]	AM9	MDB15
			SB_DQ[15]		
8 -CSB0	AN25	SB_CS#	SB_DQS[2]	AR8	DQSB2
8 -CSB1	AN26	SB_CS#	SB_DQS[2]	AP8	-DQSB2
	AL26	SB_CS#	SB_CS#		
	AT26	SB_CS#			
8 CKEB0	AU18	SB_CKE[0]	SB_DQ[16]	AP7	MDB16
8 CKEB1	AY16	SB_CKE[1]	SB_DQ[17]	AR7	MDB17
	AW15	SB_CKE[2]	SB_DQ[18]	AR10	MDB18
	AV15	SB_CKE[3]	SB_DQ[19]	AR10	MDB18
			SB_DQ[20]	AP6	MDB20
MODT_B0	AL26	SB_ODT[0]	SB_DQ[21]	AP9	MDB21
MODT_B1	AP26	SB_ODT[1]	SB_DQ[22]	AP9	MDB22
	AM26	SB_ODT[2]	SB_DQ[23]	AR9	MDB23
	AK26	SB_ODT[3]			
			SB_DQS[3]	AN13	DQSB3
			SB_DQS[3]	AN12	-DQSB3
8 DCLKB0	AL21	SB_CLK[0]	SB_DQ[24]	AM12	MDB24
8 -DCLKB0	AL22	SB_CLK[0]	SB_DQ[25]	AM13	MDB25
8 DCLKB1	AL20	SB_CLK[1]	SB_DQ[26]	AR13	MDB26
8 -DCLKB1	AK20	SB_CLK[1]	SB_DQ[27]	AP13	MDB27
	AM23	SB_CLK[2]	SB_DQ[28]	AL12	MDB28
	AP21	SB_CLK[2]	SB_DQ[29]	AL13	MDB29
	AN21	SB_CLK[3]	SB_DQ[30]	AR12	MDB30
			SB_DQ[31]	AP12	MDB31
			SB_DQS[4]	AN28	DQSB4
			SB_DQS[4]	AN28	-DQSB4
8 VREF_DQB	AH1	FC_AH1			
7 VREF_DQA	AH4	FC_AH4			
			SB_DQ[32]	AR28	MDB32
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			SB_DQ[34]	AL28	MDB34
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			SB_DQ[36]	AP28	MDB36
			SB_DQ[37]	AP29	MDB37
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			SB_DQ[41]	AP31	MDB41
			SB_DQ[42]	AP35	MDB42
			SB_DQ[43]	AP34	MDB43
			SB_DQ[44]	AR32	MDB44
			SB_DQ[45]	AR31	MDB45
			SB_DQ[46]	AR35	MDB46
			SB_DQ[47]	AR34	MDB47
			SB_DQS[6]	AL33	DQSB6
			SB_DQS[6]	AM33	-DQSB6
			SB_DQ[48]	AM32	MDB48
			SB_DQ[49]	AM31	MDB49
			SB_DQ[50]	AL35	MDB50
			SB_DQ[51]	AL32	MDB51
			SB_DQ[52]	AM34	MDB52
			SB_DQ[53]	AL31	MDB53
			SB_DQ[54]	AM35	MDB54
			SB_DQ[55]	AL34	MDB55
			SB_DQS[7]	AG35	DQSB7
			SB_DQS[7]	AG34	-DQSB7
			SB_DQ[56]	AH35	MDB56
			SB_DQ[57]	AH34	MDB57
			SB_DQ[58]	AE34	MDB58
			SB_DQ[59]	AE35	MDB59
			SB_DQ[60]	AJ35	MDB60
			SB_DQ[61]	AJ34	MDB61
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			SB_DQ[63]	AE33	MDB63

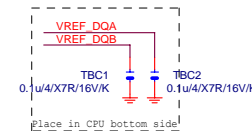
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LGA1155[10SC1-F01155-01R]

LGA1155
ILM_BP/1156/CSP

Need check the new CPU ME

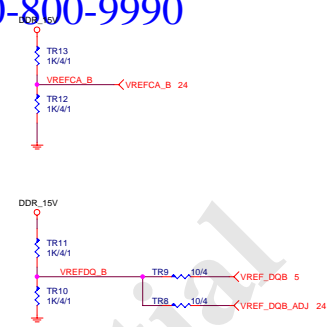
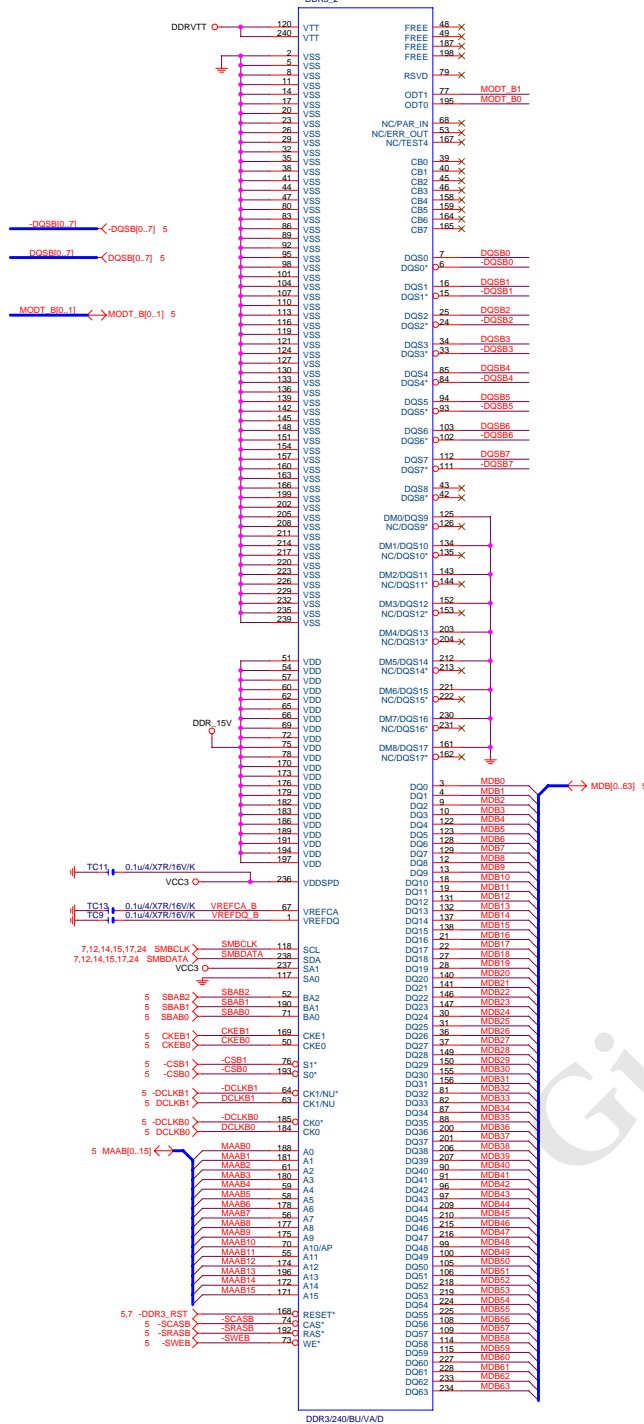


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CPU LGA1156-B

Title	Document Number	Rev
Size	Custom	1.01
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GA-P61-USB3-B3

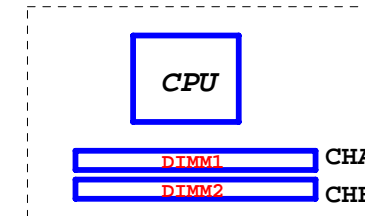


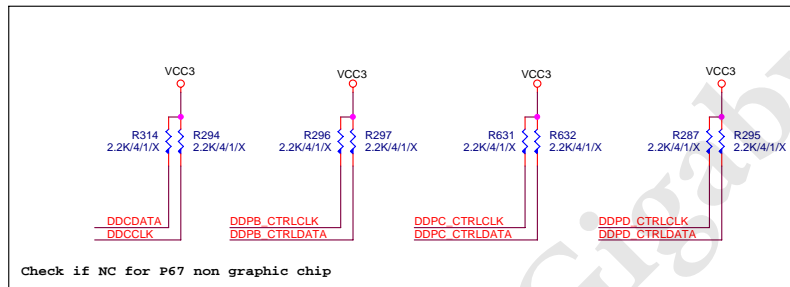
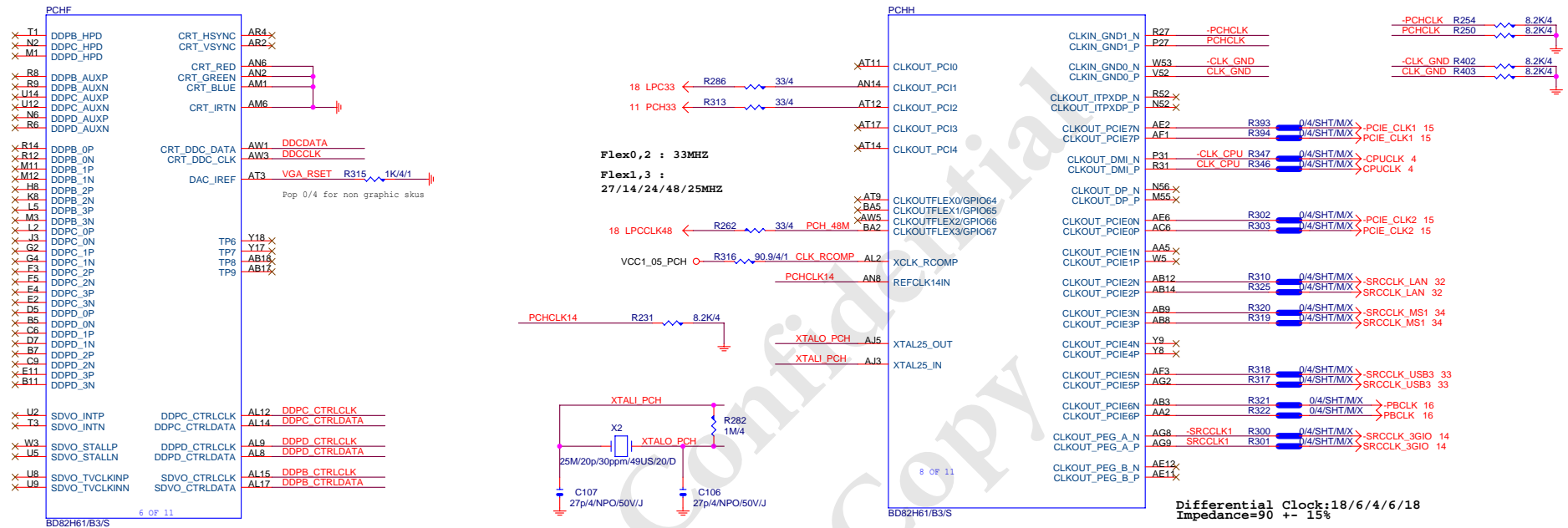
DDR3 1066,1333,1600MHZ BANDWIDTH

```
DDR3 1066MHZ
DDR3 clock=533MHZ
DDR3 single channel bandwidth=533x2x8Byte=8.5GB/s
DDR3 dual channel bandwidth=533x2x2x8Byte=17GB/s
```

```
DDR3 1333MHZ
DDR3 clock=667MHZ
DDR3 single channel bandwidth=10.6GB/s
DDR3 dual channel bandwidth=21GB/s
```

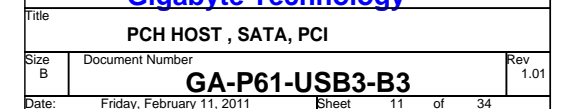
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DDR3 1600MHZ
DDR3 clock=800MHZ
DDR3 single channel bandwidth=12.8GB/s
DDR3 dual channel bandwidth=25.6GB/s
```

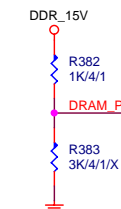
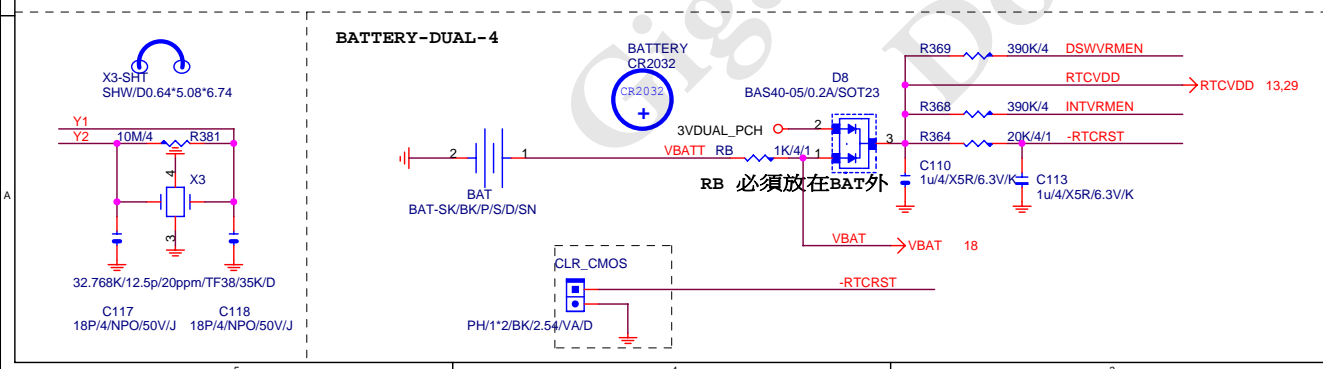
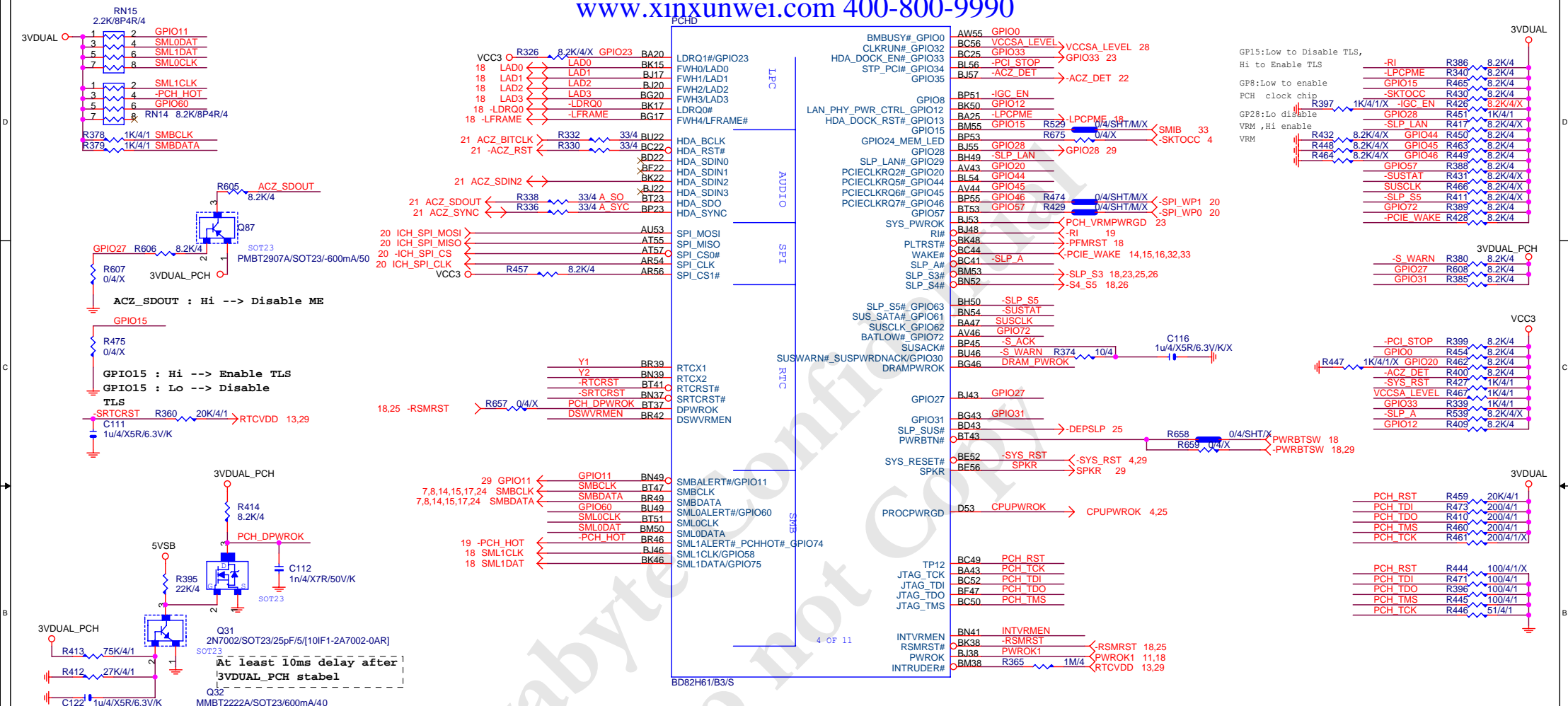


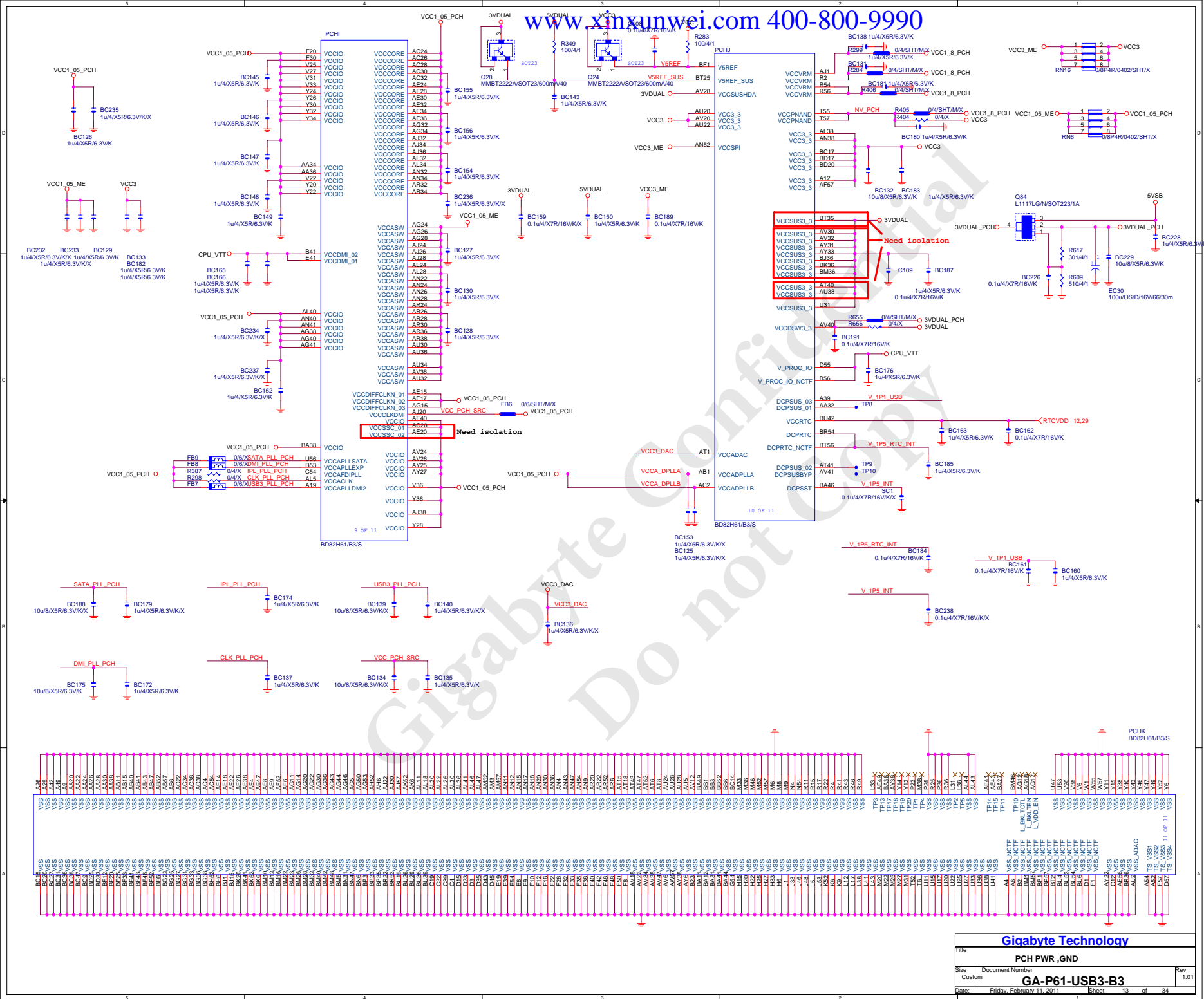


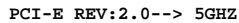
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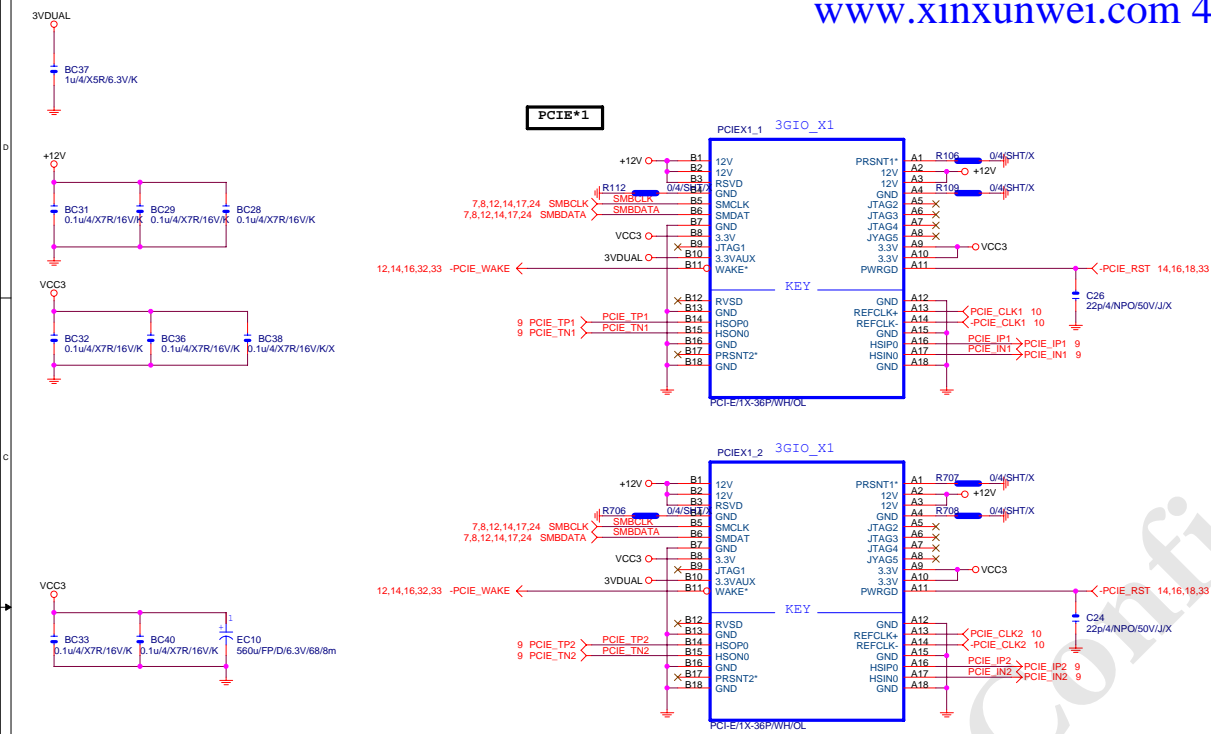
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PCH DISPLAY ,CLK BUFFER		
Size	Document Number	Rev
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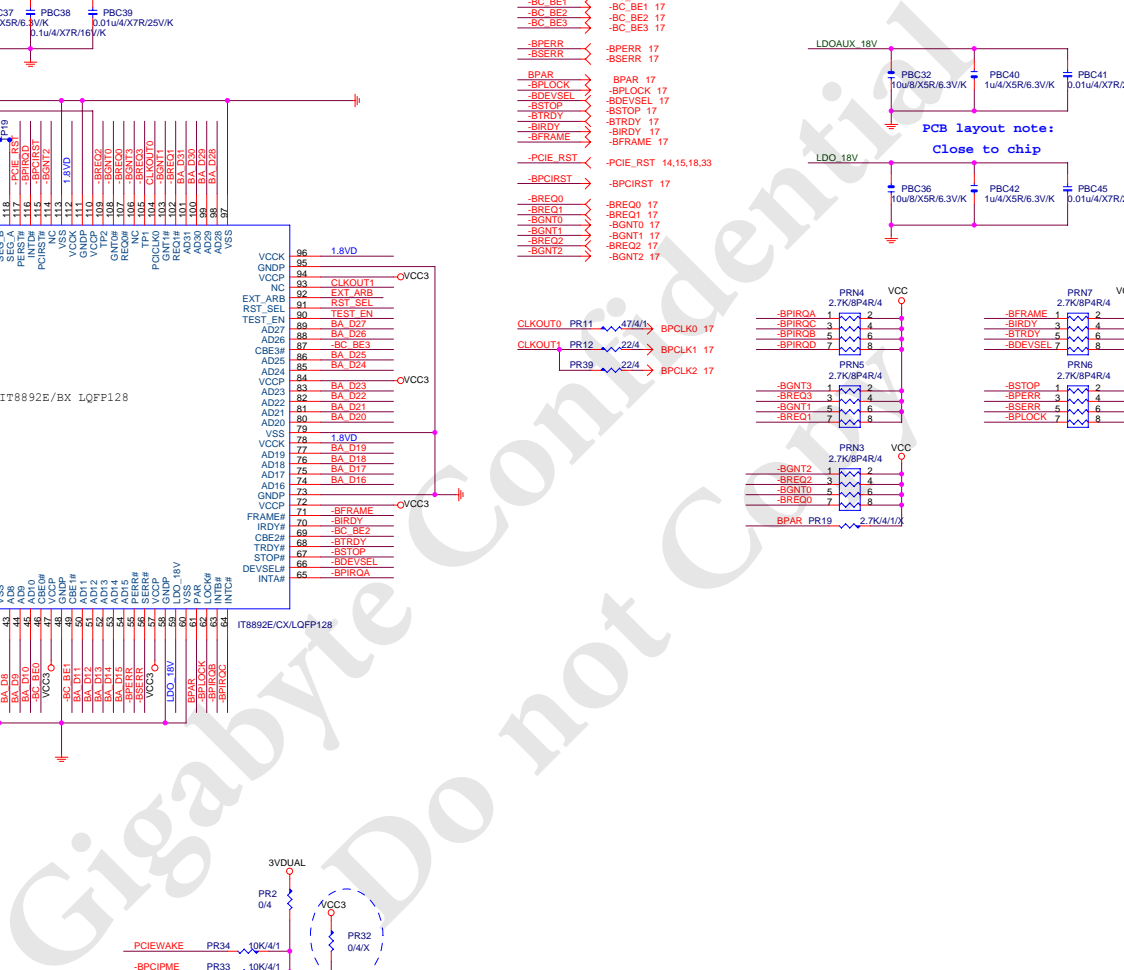




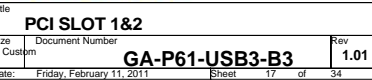


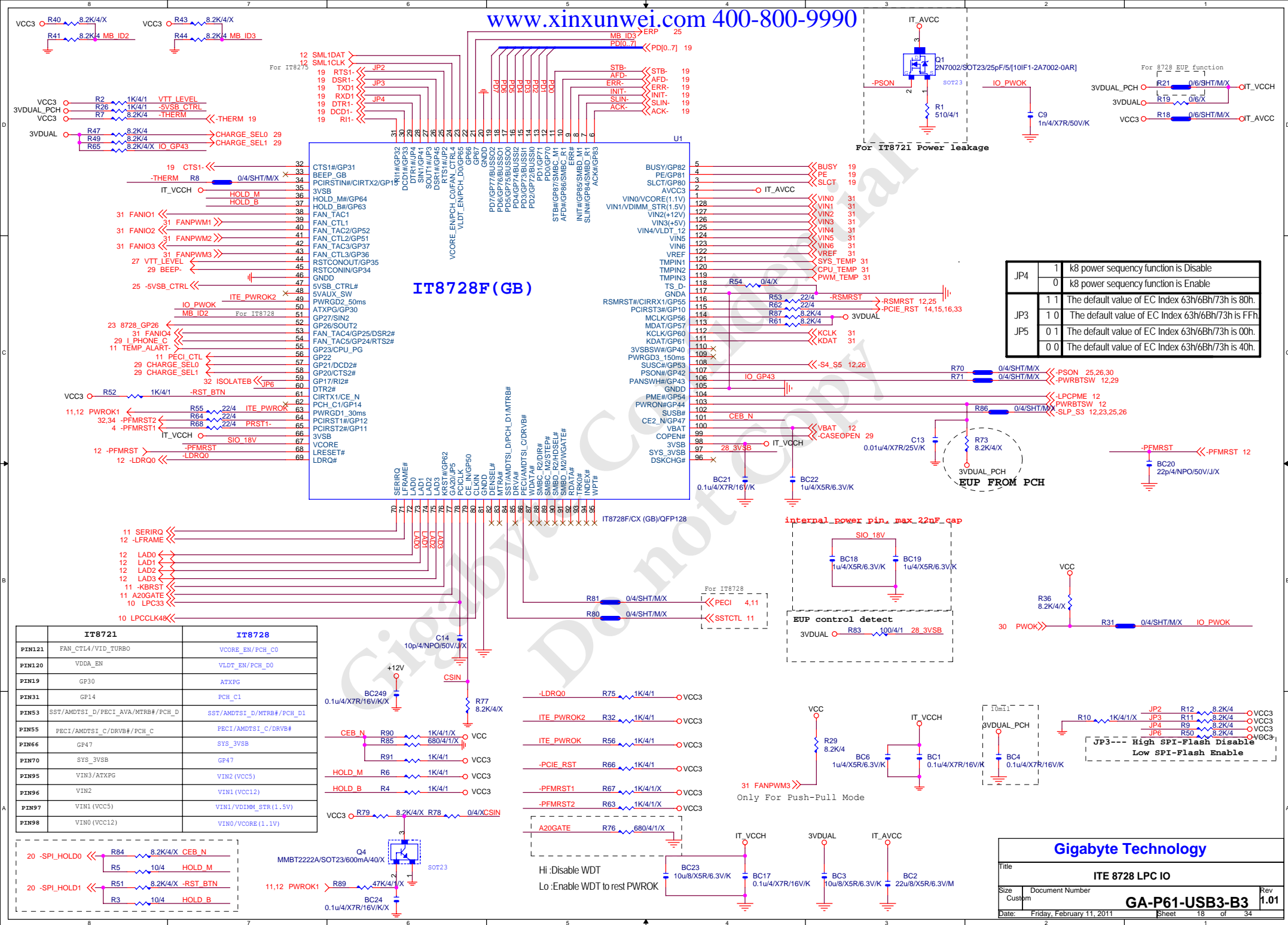
Gigabyte Technology

Title			PCI EXPRESS X 4 PORT
Size	Document Number	Rev	1.01
Custom	GA-P61-USB3-B3		
Date:	Friday, February 11, 2011	Sheet	15 of 34

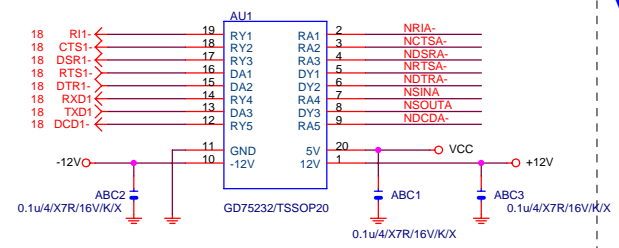


High: PCICLK INPUT form CLK Gen
Low: PCICLK OUTPUT form IT8893 chip

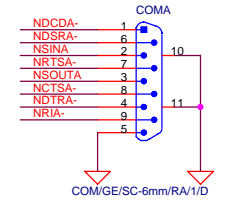
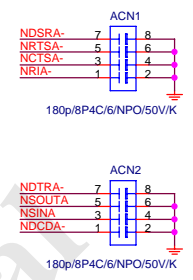
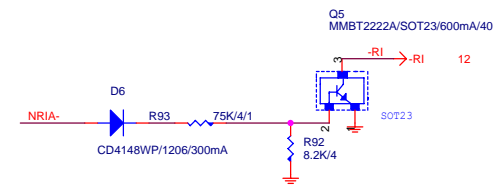




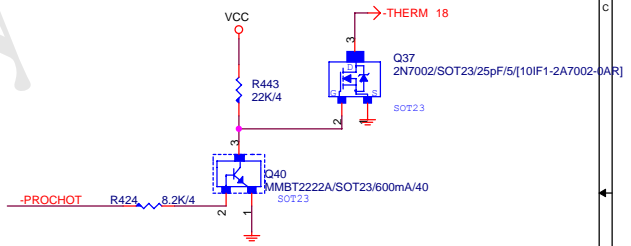
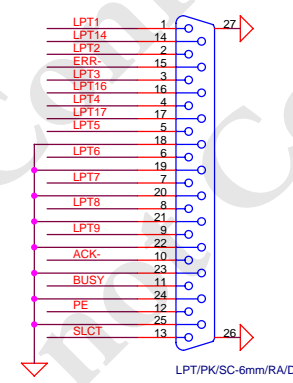
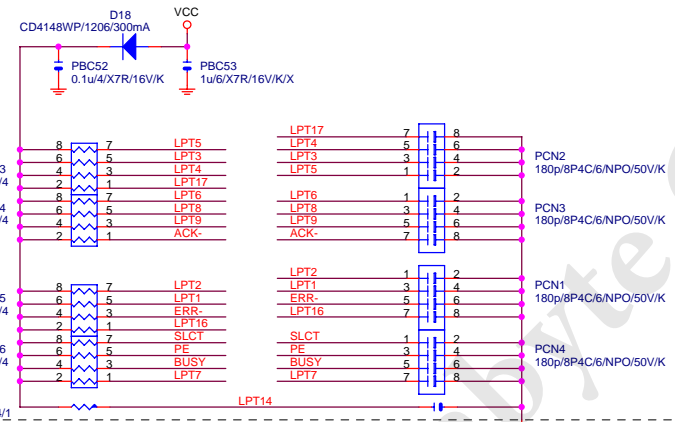
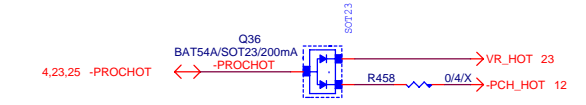
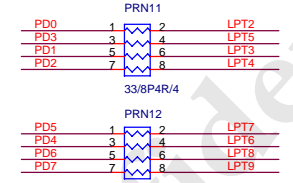
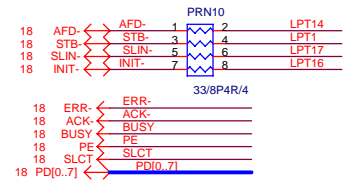
COMA



COM R1



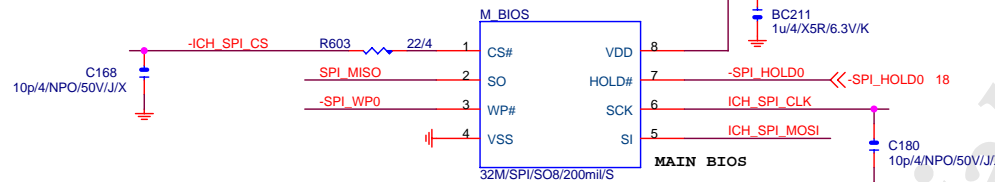
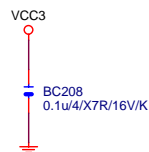
LPT PORT



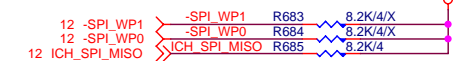
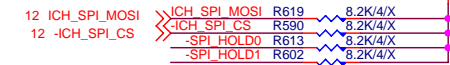
Gigabyte Technology

Title			
COM & PROHOT/Dynamic O.C.			
Size	Document Number	Rev	
Custom			
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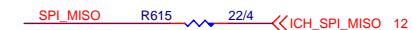
GA-P61-USB3-B3 1.01



MOSI For DMI RX Termination Voltage



Default int pull up



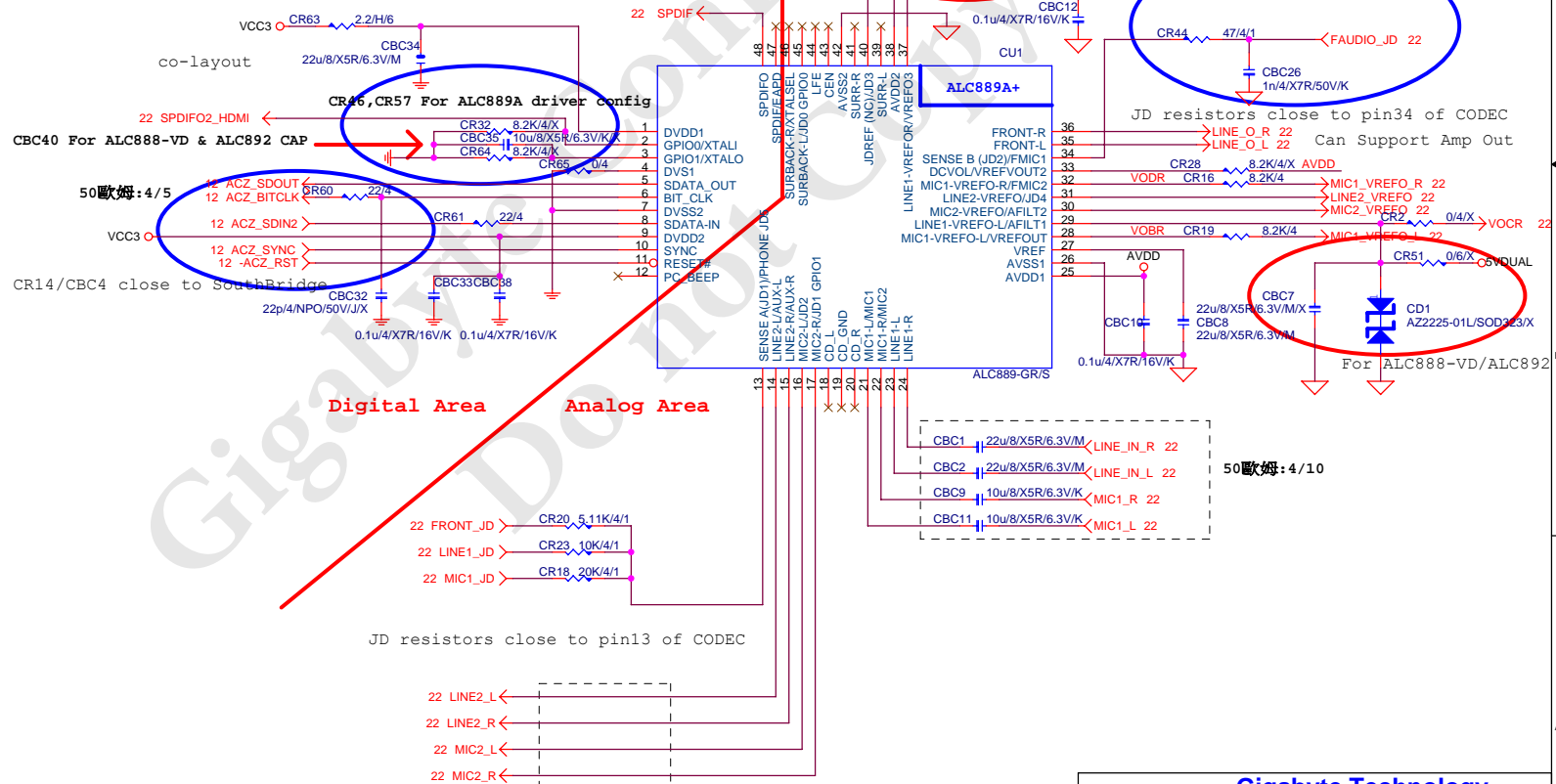
BOOT DEVICE	GNT0	GNT1
LPC	0	0
PCI	0	1
NAND	1	0
SPI	1	1

1 means floating
0 means PD 1K

Gigabyte Technology

Title			BIOS
Size	Document Number	GA-P61-USB3-B3	
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Date:	Friday, February 11, 2011	Sheet	20 of 34

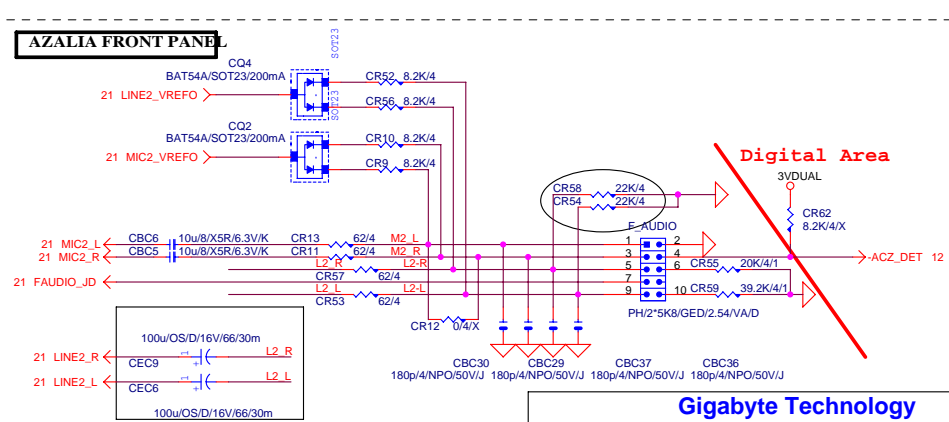
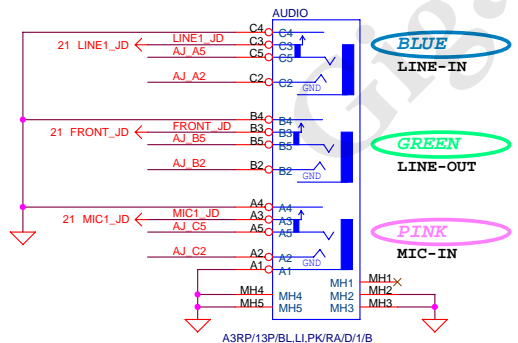
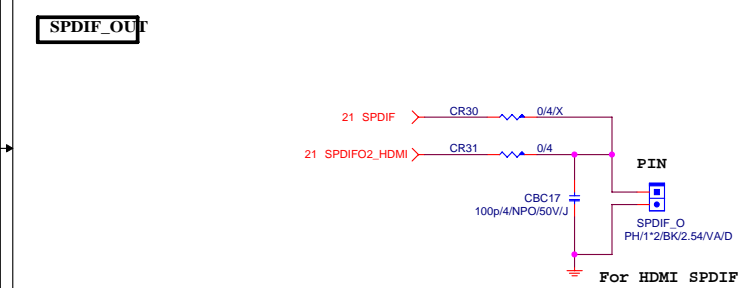
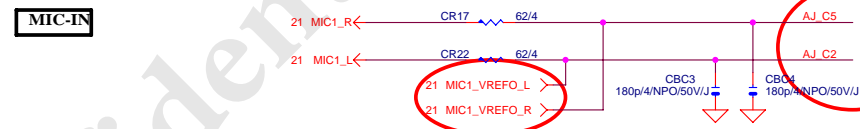
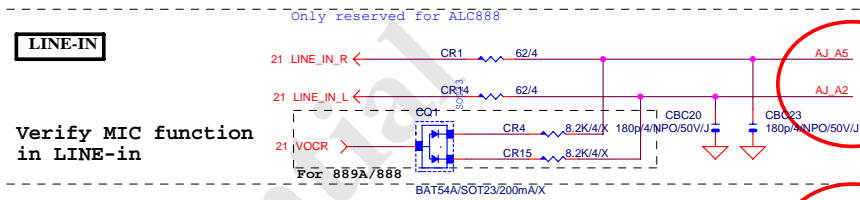
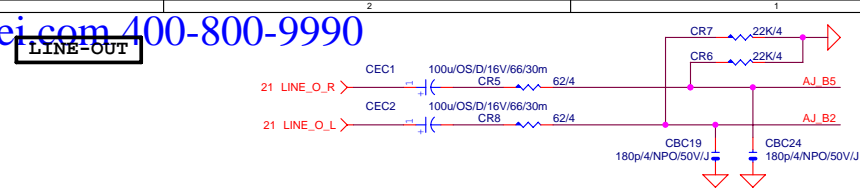
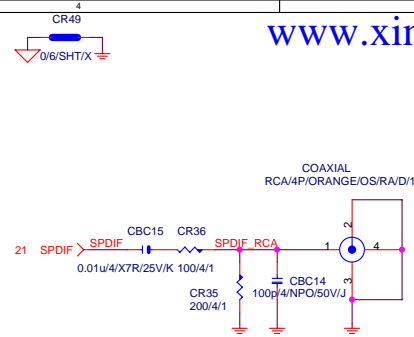
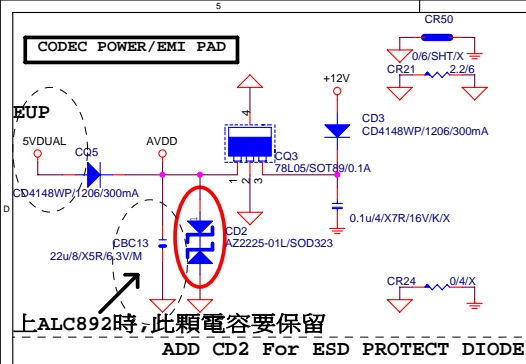
	ALC883	ALC888-VA	ALC888B	ALC888-VD	ALC892R	ALC889	ALC889A
CR32	X	X	X	X	X	X	O
CR64	X	X	X	X	X	X	O
CR65	O	O	X	X	X	O	O
CBC35	X	X	X	10uF/X5R10uF/X5R	X	X	X
CR28	O	X	X	X	X	X	X
CR34	20K/1%	20K/1%	20K/1%	20K/1%	20K/1%	20K/1%	20K/0.1%
CR31	X	X	O	X	O	O	X
CR30	O	O	X	O	X	X	O
CBC1/CBC2/CBC5/ CBC6/CBC9/CBC11	4.7uF /X5R	4.7uF /X5R	4.7uF /X5R	4.7uF /X5R	4.7uF /X5R	10uF /X5R	4.7uF /X5R
CR5/CR8/CR11/CR4/ CR17/CR22/CR45/CR33/ CR47/CR40/CR26/CR37/ CR13/CR11/CR57/CR53	75 ohm	75 ohm	75 ohm	75 ohm	75 ohm	66 ohm or lower	75 ohm
CR51/CD1/CBC7	X	X	X	O	X	X	X
CD2/CD3/CQ3/CQ5	O	O	O	X	O	O	O



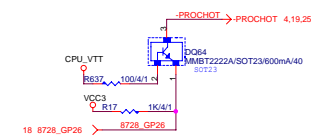
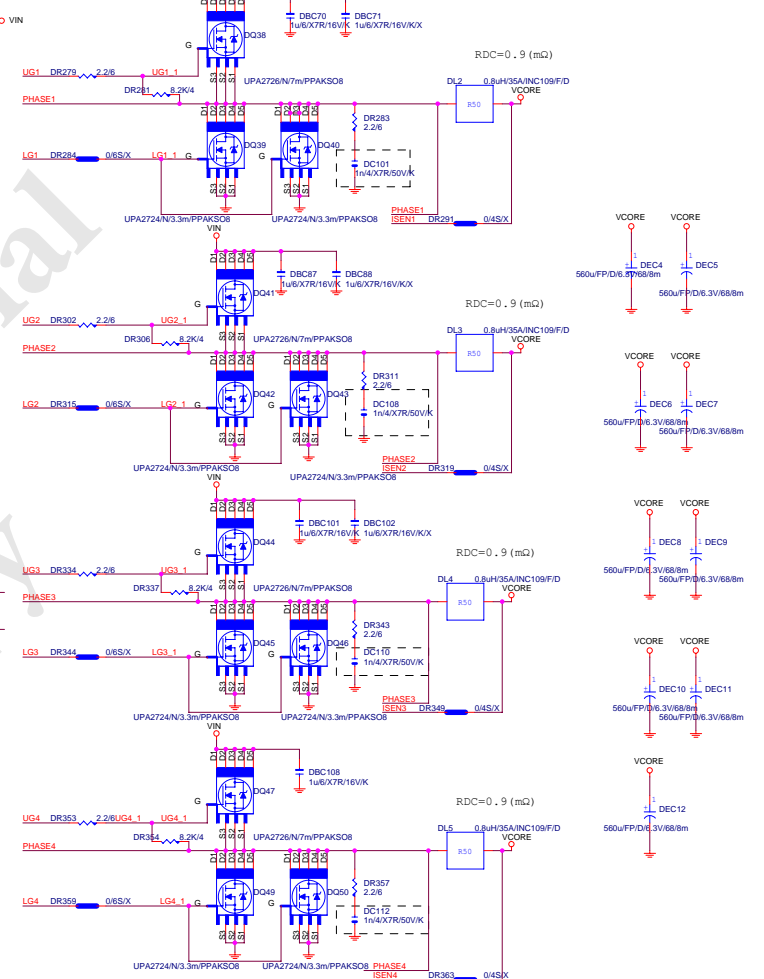
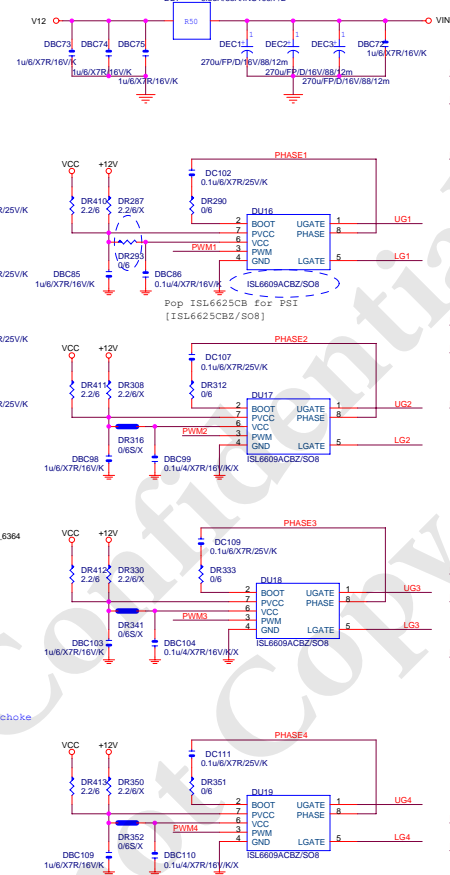
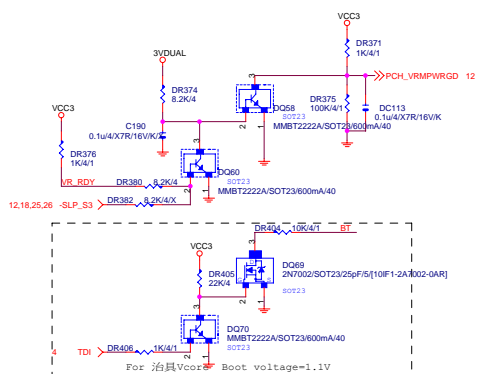
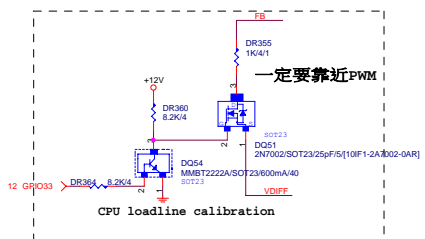
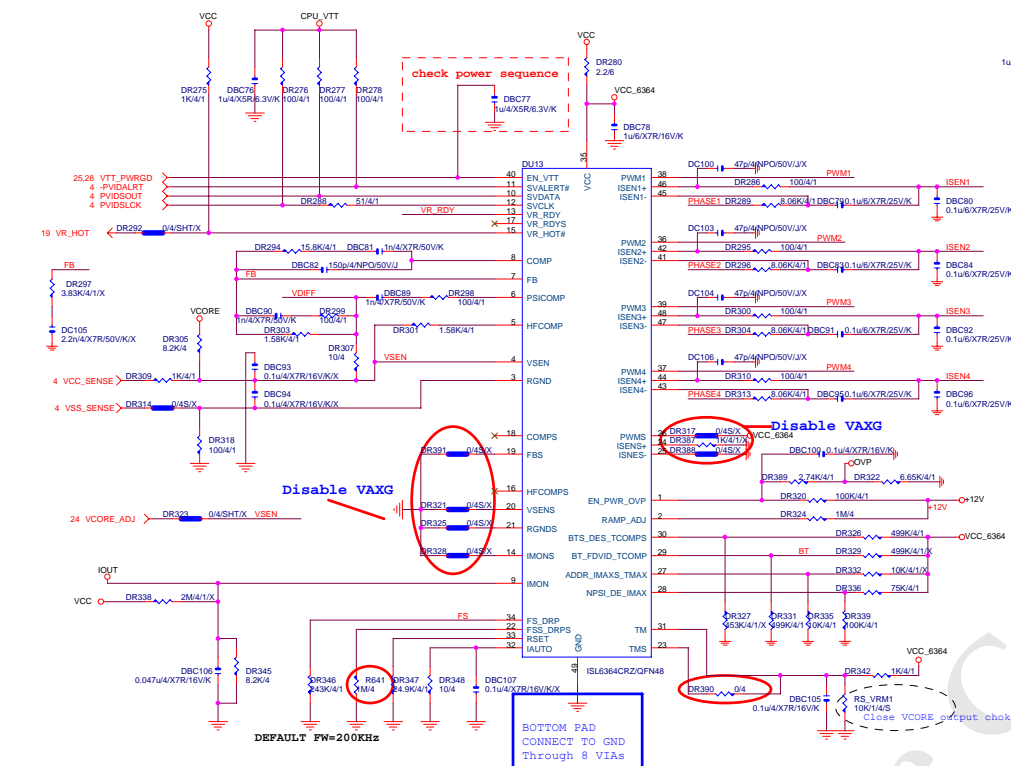
Can Support Amp Out

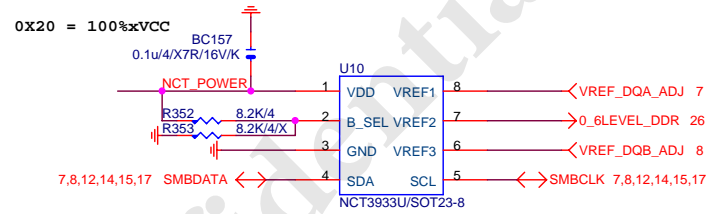
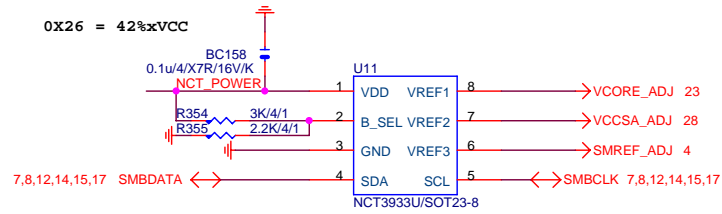
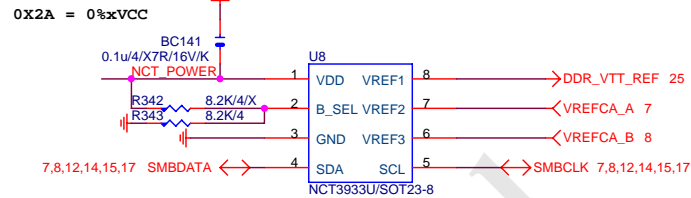
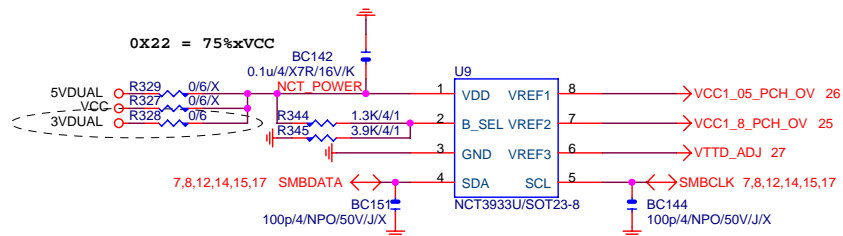
Gigabyte Technology

Title					HD AUDIO ALC892				
Size	Custom	Document Number	GA-P61-USB3-B3				Rev	1.01	
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Gigabyte Technology			
Title			
AUDIO JACK			
Size	Document Number	GA-P61-USB3-B3	
Custom			Rev 1.01
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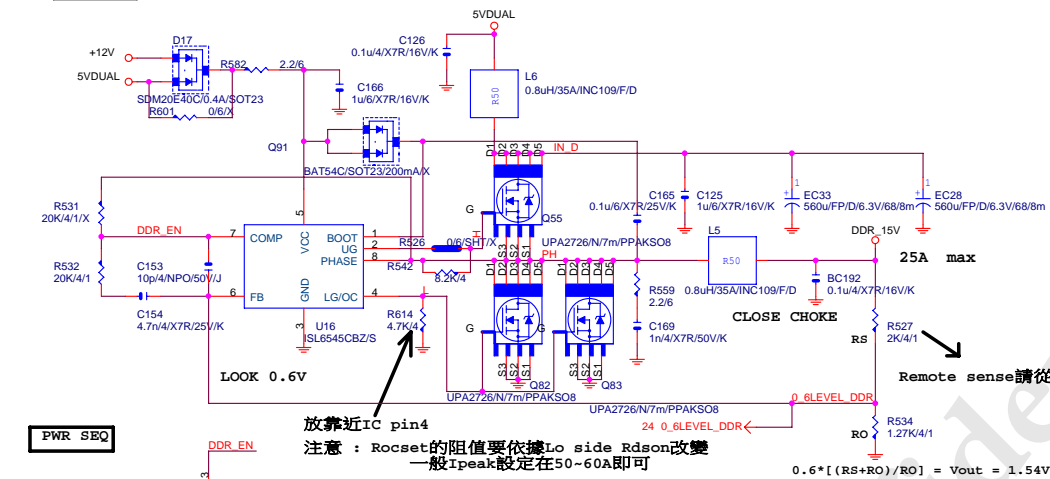


up6262	0X2A	0X20	0X22	0X26
VREF1	DDR_VTT	VREF_DDRA_DQ	VCC1_05_PCH	VCORE
VREF2	VREF_DDRA_CA	DDR15V	VCC1_8_PCH	VCCSA
VREF3	VREF_DDRA_CAV	VREF_DDRB_DQ	CPU_VTT	SMREF

Gigabyte Technology

Title			CPU CORE VR-2
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Custom	GA-P61-USB3-B3		
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DDR18V



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

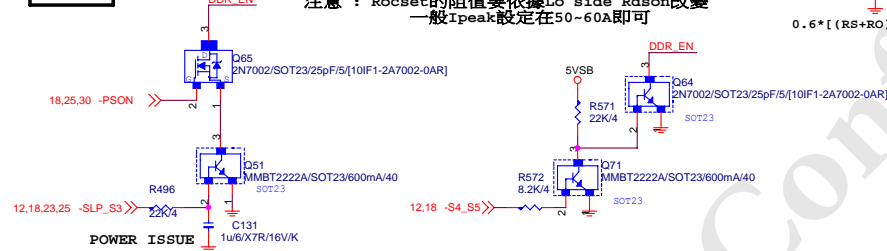
560u/FP/D/6.3V/68/8m RIPPLe CURRENT=4.7A
Coefficient=1.7(85°C), 1(105°C)

VIN Ripple current=4.7X1.7=7.99A(85°C)
-->故固態電容須2x7.99=15.98>11.45A

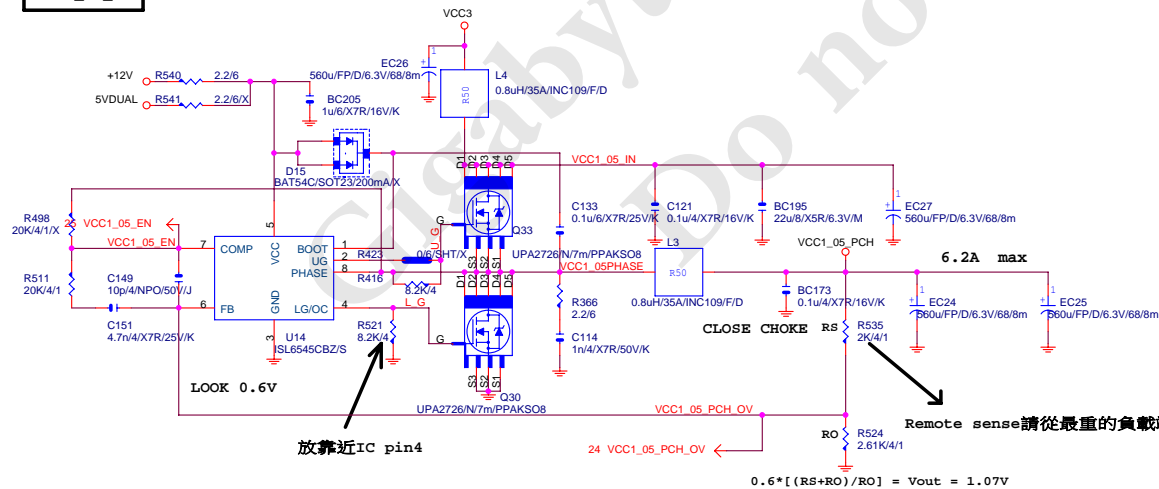
OCP : Ipeak=(2xIocsetxRocset)/Rdson
typ Iocset=20uA , Rocset=4.7k

OCP
: 67.14A=(2x20uax4.7k)/(5.6m/5.6m)

PWR SEQ



VCC1_05_PCH



VIN=3.3V, VOUT=1.05V, IOUT=7.5A, PHASE=1
IRMS=3.4875A

1000u/D/6.3V/8C/30m RIPPLe CURRENT=1.14A
Coefficient=1.7(85°C), 1(105°C)

VIN Ripple current=1.14X1.7=1.938A(85°C)

-->故電解電容須2x1.938=3.876>3.4875A

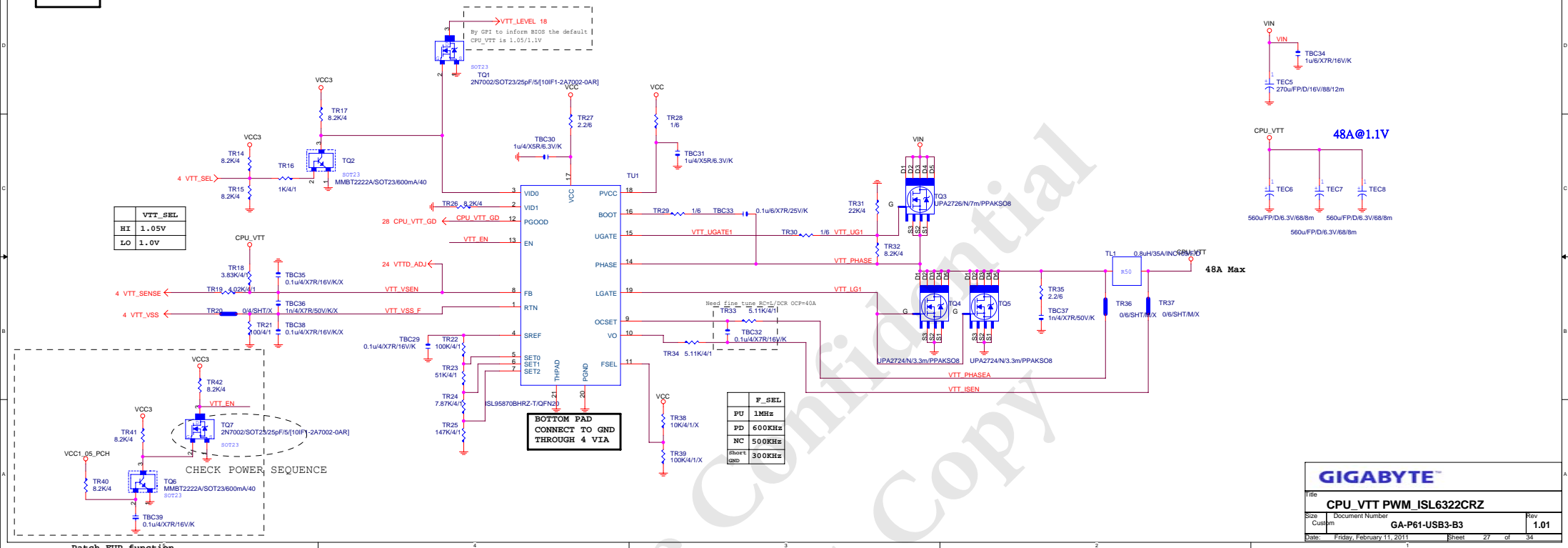
OCP : Ipeak=(2xIocsetxRocset)/Rdson
typ Iocset=20uA , Rocset=8.2k

OCP : 58.57A=(2x20uax8.2k)/5.6m

Gigabyte Technology

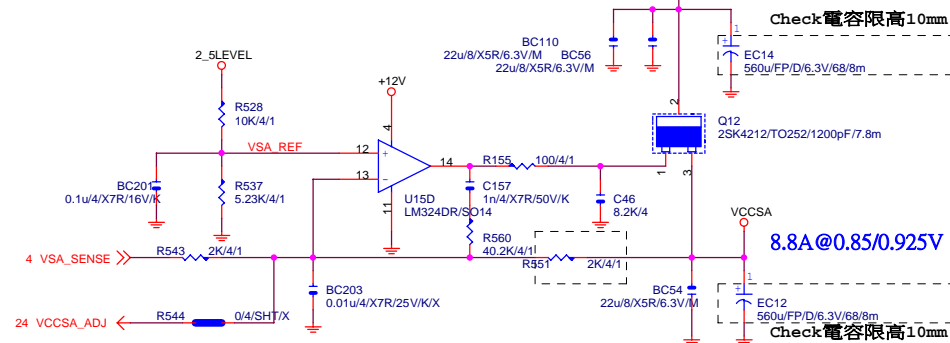
DDR_15V

Size Custom Document Number GA-P61-USB3-B3 Rev 1.01
Date: Friday, February 11, 2011 Sheet 26 of 34



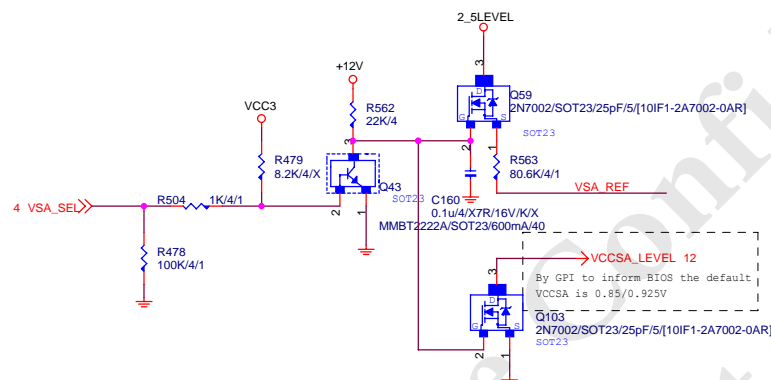
VCC_SA

www.xinxiunwei.com 400-800-9990

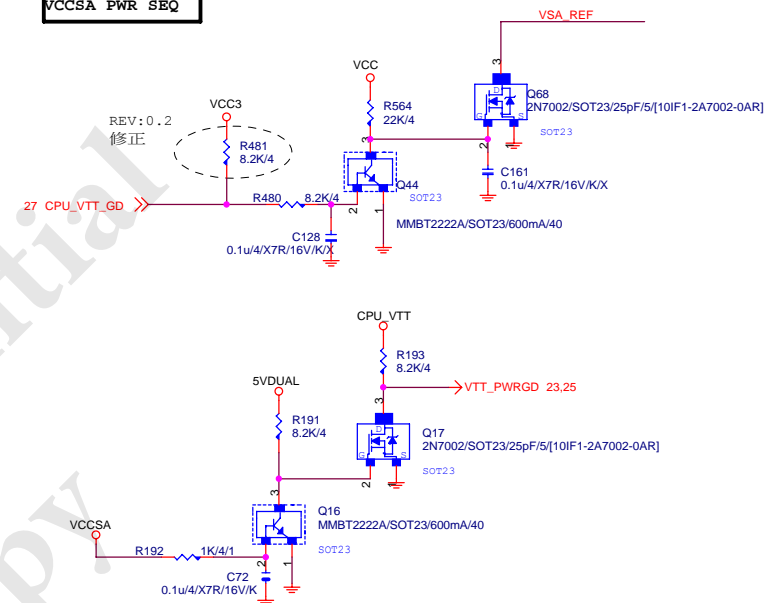


PDG 1.01

	VSA_SEL
HI	0.85V
LO	0.925V

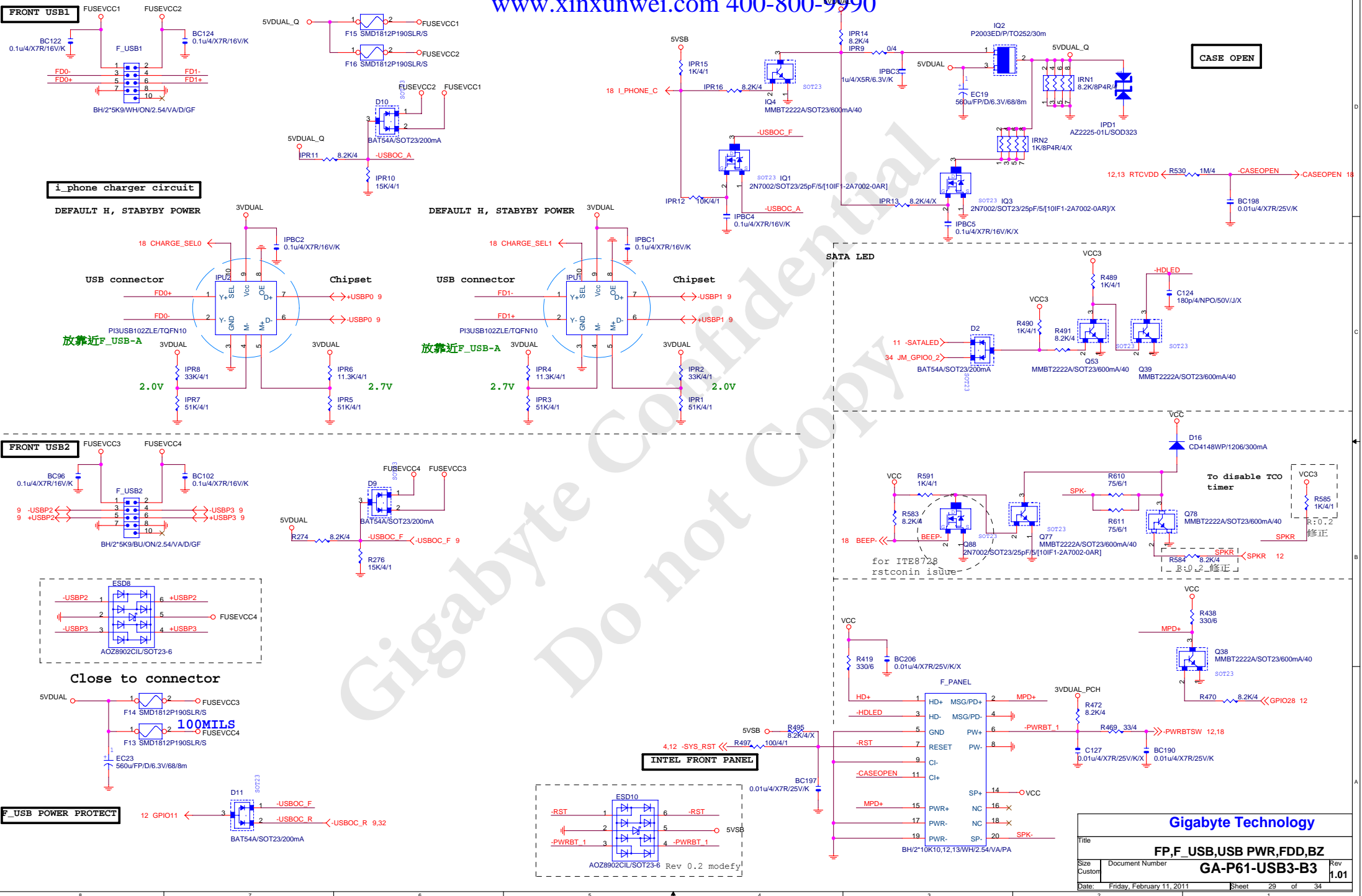


VCCSA PWR SEQ



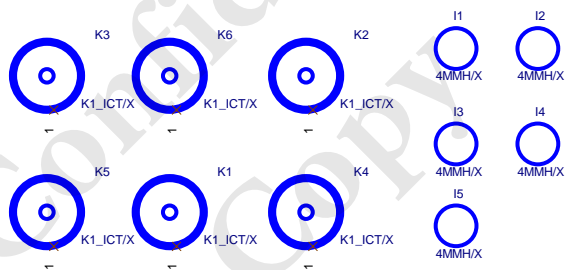
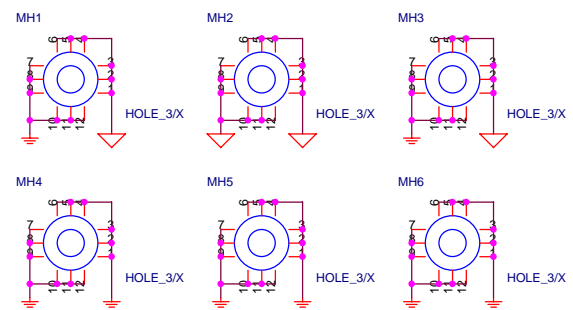
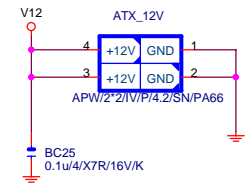
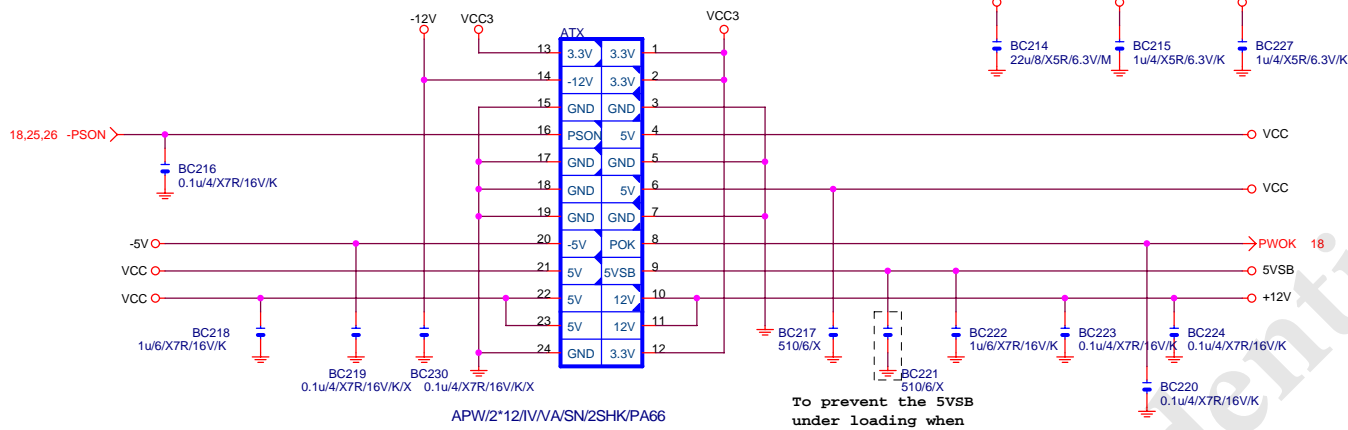
Gigabyte Technology

Title		
CPU VTT PWM_ISL6312		
Size	Document Number	Rev
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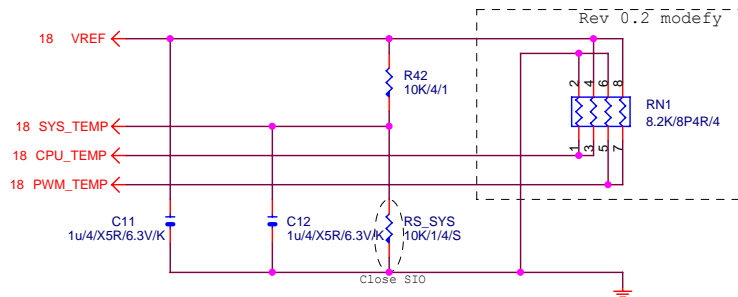
ATX POWER CONNECTOR

www.xinxunwei.com 400-800-9990

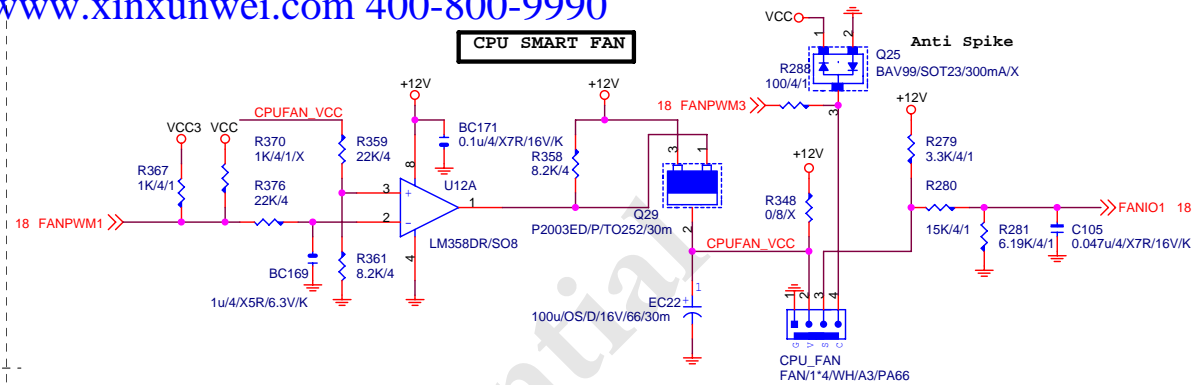


Gigabyte Technology			
Title			
ATX POWER CONNECTOR			
Size	Document Number	Rev	
Custom	GA-P61-USB3-B3	1.01	
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	2		1

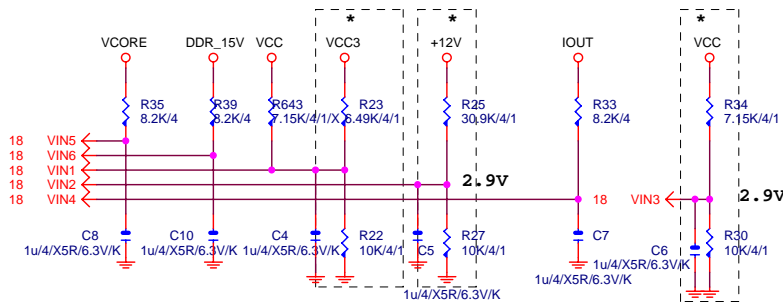
TEMP H/W MONITOR



CPU SMART FAN

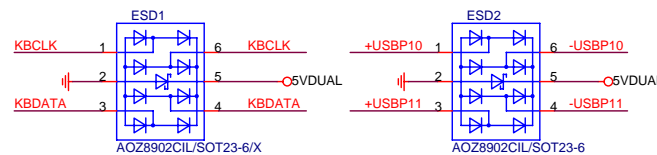
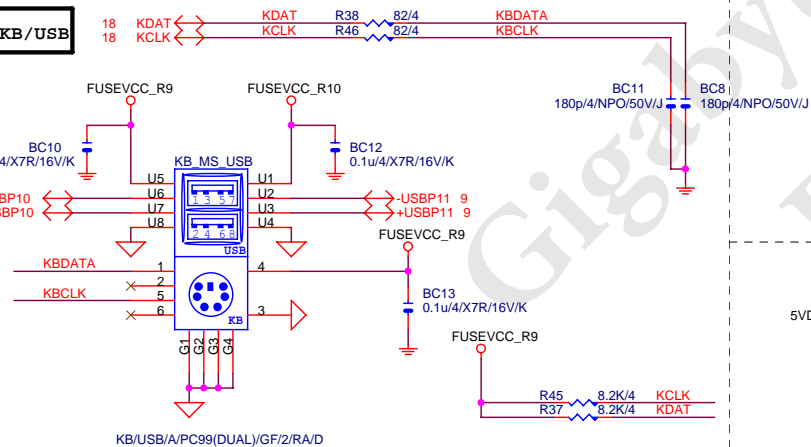


VOLTAGE-- H/W MONITOR

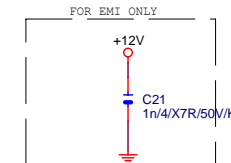
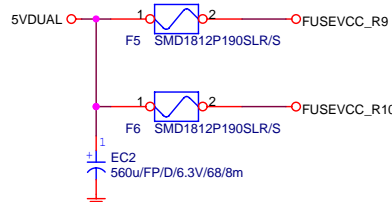
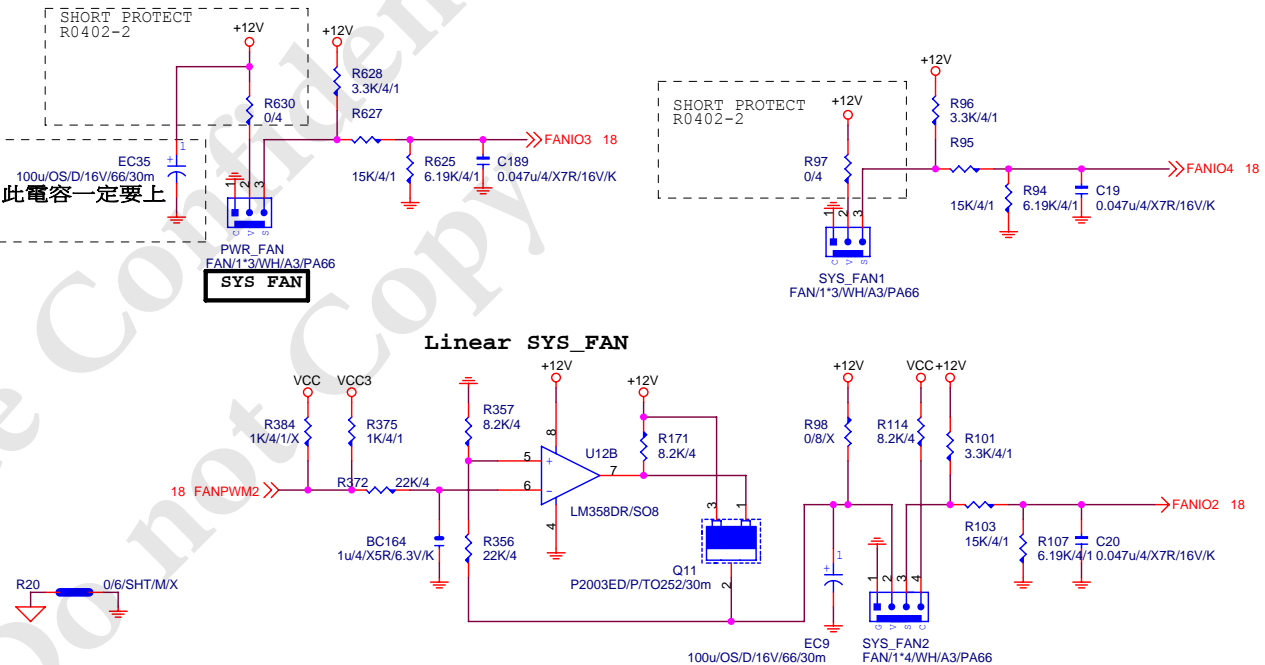


The division voltage of VIN2 & VIN3 must be around 2.9V

KB/USB



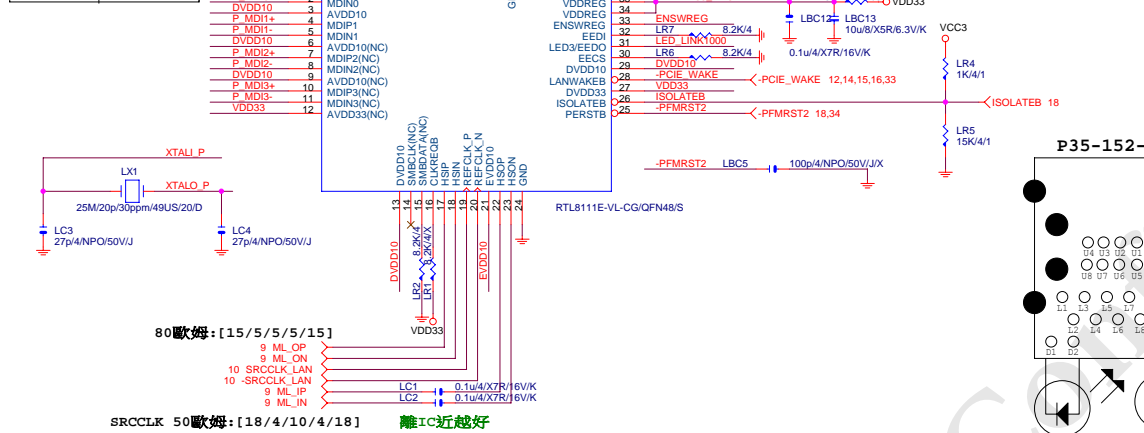
Linear SYS_FAN



PCIE-1G LAN

Power domain chart

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



USB30_LAN CONNECTOR

