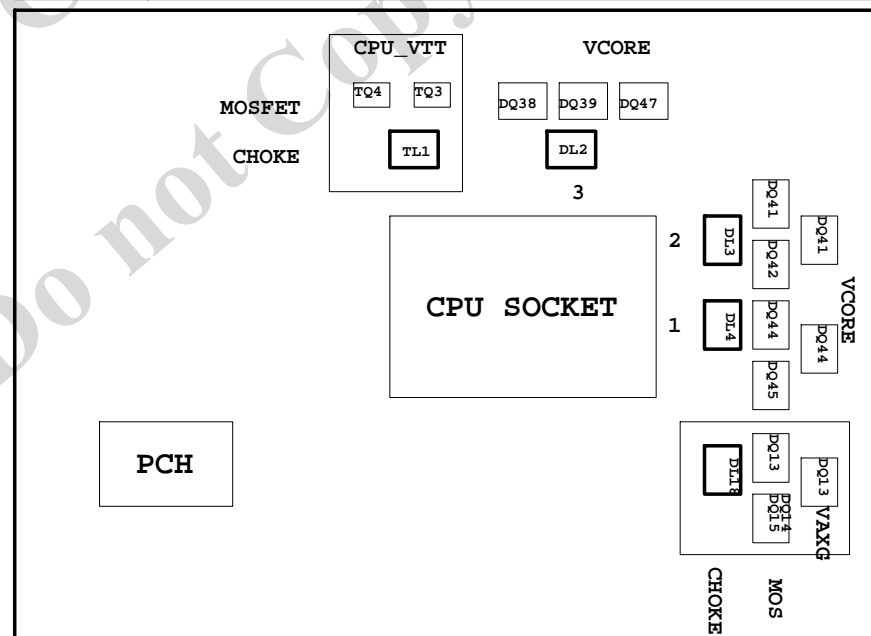


SHEET TITLE

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
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 EXPRESSX4 SLOT / PCIE X1 SLOT
16	PCI SLOT 1~2
17	I/O ITE8728
18	COM,TPM
19	Dual BIOS
20	ALC887-VD2
21	REAR AUDIO JACK
22	ISL95836_VCORE_1
23	ISL95836_VCORE_2
24	DISCRETE POWER
25	PCH CORE / VOLTAGE CONSOLE
26	RT8120_CPU_VTT
27	VCCSA POWER

SHEET TITLE

28	F_PANEL , F_USB
29	ATX POWER, CLOCK GEN
30	HWM,KB/MS , FAN CTRL
31	ARTHEROS AR8161/AR8151
32	mSATA
33	RT8120_DDR POWER
34	R_USB/HDMI
35	ITE8892
36	
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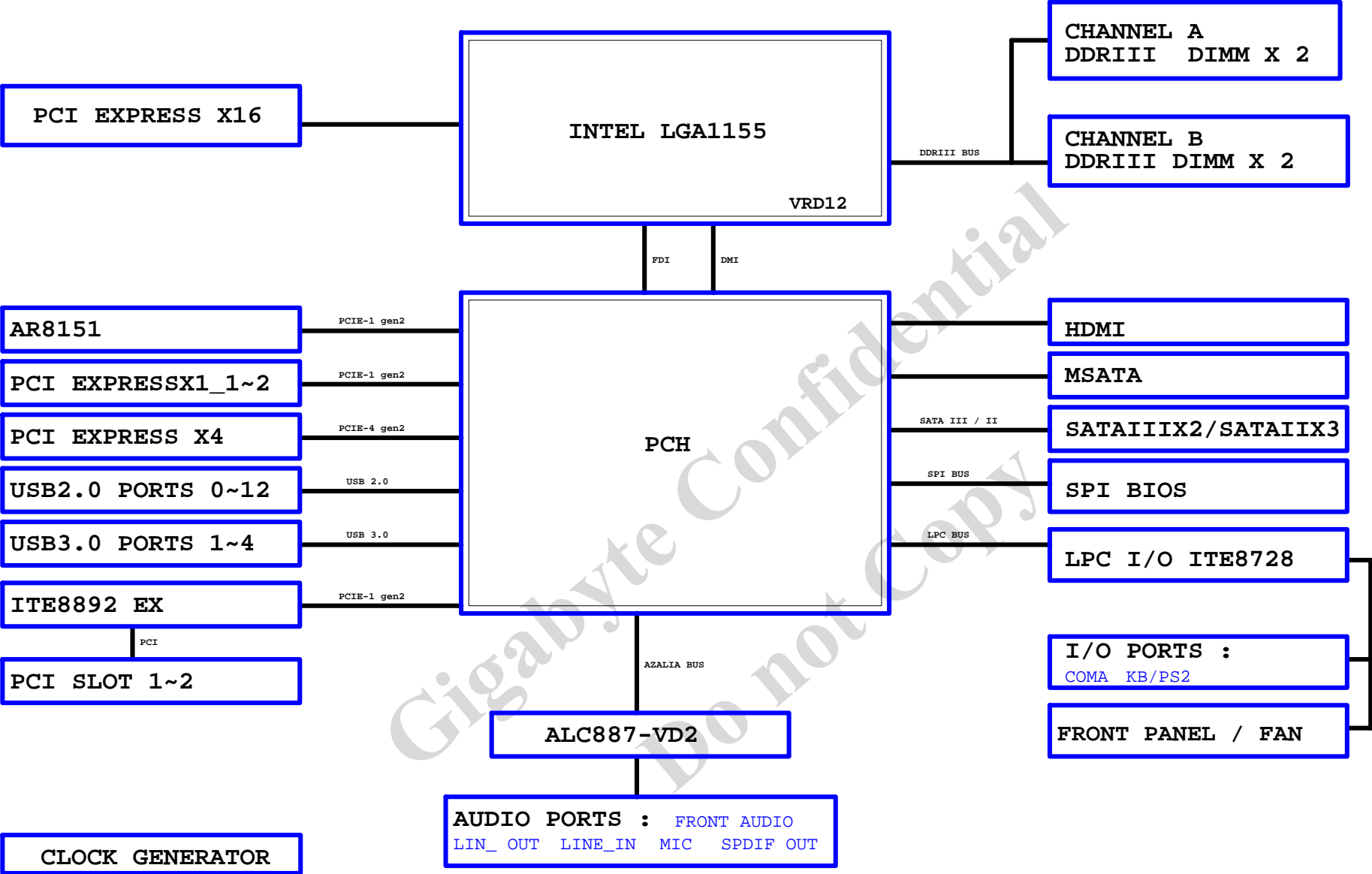
Gigabyte Technology

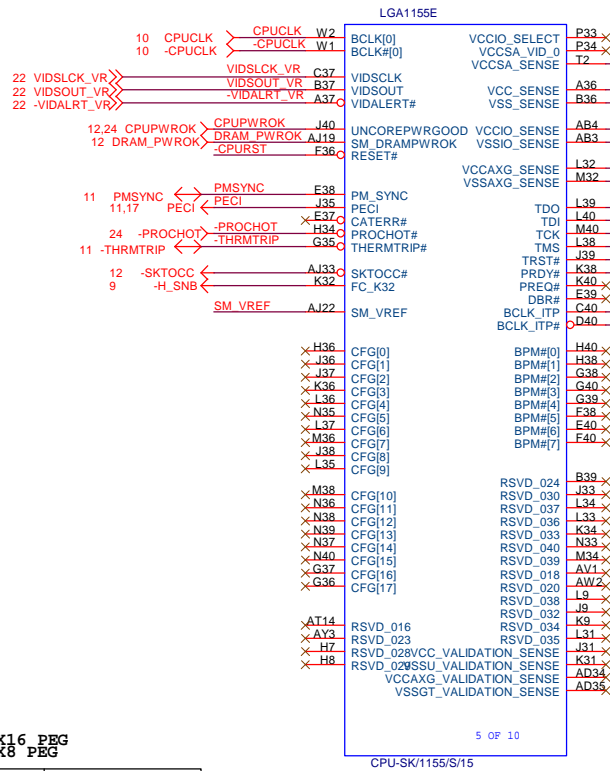
Title		
Cover Sheet		
Size	Document Number	Rev
Custom	GA-Z77P-D3	1.0
Date:	Monday, February 13, 2012	Sheet 1 of 35

Component value change history

[illegible][illegible]

BLOCK DIAGRAM



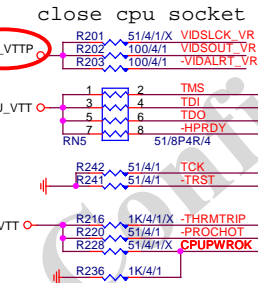
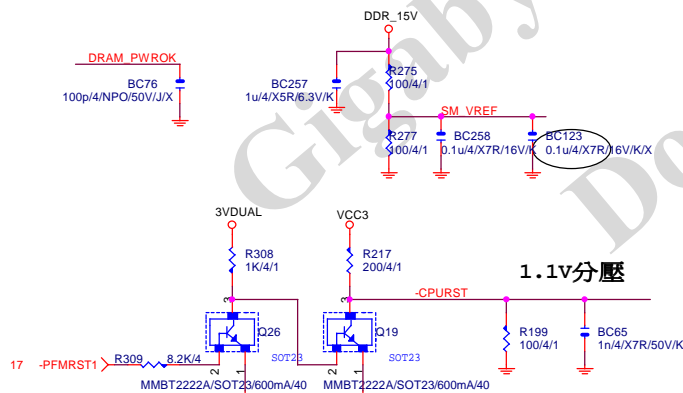
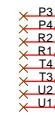
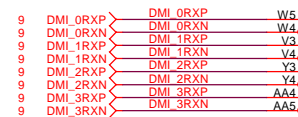


CFG5=1: 1x16 PEG
CFG5=0: 2x8 PEG

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
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	8x8, X4, X4

CFG 0-17 all internal PULL-UP

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

GEN

3 OF 10

CPU_VTT CPU_VTT CPU_VTT CPU_VTT

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

CPU_VTT CPU_VTT CPU_VTT CPU_VTT

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

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

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

Stitching caps for PCIE, DMI bus

FDI:4/5(SINGLE END)

9 FDI_FSYNCO > FDI_FSYNCO AC5
9 FDI_LSYNCO > FDI_LSYNCO AC4

FDI:4/5(SINGLE END)

9 FDI_FSYNCO > FDI_FSYNCO AE5
9 FDI_LSYNCO > FDI_LSYNCO AE4

FDI:4/5(SINGLE END)

9 FDI_INT > FDI_INT AG3
9 FDI_INT > FDI_INT R174 24.9/4/1
9 FDI_RCOMP > FDI_RCOMP AE2
9 FDI_ICOMPO > FDI_ICOMPO AE1

FDI:10/5(SINGLE END)

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

EXP_RXP0 B11
EXP_RXN0 B12
EXP_RXP1 D12
EXP_RXN1 D11
EXP_RXP2 C10
EXP_RXN2 C9
EXP_RXP3 E10
EXP_RXN3 E9
EXP_RXP4 B8
EXP_RXN4 B7
EXP_RXP5 C6
EXP_RXN5 C5
EXP_RXP6 A5
EXP_RXN6 A6
EXP_RXP7 E2
EXP_RXN7 E1
EXP_RXP8 F4
EXP_RXN8 F3
EXP_RXP9 G2
EXP_RXN9 G1
EXP_RXP10 H3
EXP_RXN10 H4
EXP_RXP11 J1
EXP_RXN11 J2
EXP_RXP12 K3
EXP_RXN12 K4
EXP_RXP13 L1
EXP_RXN13 L2
EXP_RXP14 M3
EXP_RXN14 M4
EXP_RXP15 N1
EXP_RXN15 N2

PEG

4 OF 10

CPU-SK/1155/S/15

LGA1155C

FDI LINK

EXP_TXP0.151 >>> EXP_TXP[0.15] 14
EXP_TXN0.151 >>> EXP_TXN[0.15] 14
EXP_RXP0.151 >>> EXP_RXP[0.15] 14
EXP_RXN0.151 >>> EXP_RXN[0.15] 14

EXP_TXP0 C13
EXP_TXN0 C14
EXP_TXP1 E14
EXP_TXN1 E13
EXP_TXP2 G14
EXP_TXN2 G13
EXP_TXP3 F12
EXP_TXN3 E11
EXP_TXP4 J14
EXP_TXN4 J13
EXP_TXP5 D8
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EXP_TXN6 C3
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EXP_TXN11 J5
EXP_TXP12 J6
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EXP_TXN14 N5
EXP_TXP15 N6

EXP_TXP0 C13
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EXP_TXP15 N6

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EXP_TXP14 L5
EXP_TXN14 N5
EXP_TXP15 N6

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EXP_TXN0 C14
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EXP_TXN1 E13
EXP_TXP2 G14
EXP_TXN2 G13
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EXP_TXN3 E11
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EXP_TXN4 J13
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EXP_TXN5 D7
EXP_TXP6 D3
EXP_TXN6 C3
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EXP_TXP3 F12
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EXP_TXP4 J14
EXP_TXN4

LGA1155A

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MAAA3	AV23	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]	SA_DQ[4]	AJ2	MDA4
MAAA9	AT22	SA_MA[9]	SA_DQ[5]	AJ1	MDA5
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MAAA11	AU21	SA_MA[11]	SA_DQ[7]	AL1	MDA7
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7	-SCASA	AV30	SA_CAS#	AN4	MDA9
7	-SRASA	AU28	SA_RAS#	AR3	MDA10
7	SBA00	AY29	SA_BS[0]	AN2	MDA11
7	SBA01	AW28	SA_BS[1]	AN3	MDA12
7	SBA02	AV20	SA_BS[2]	AR2	MDA13
7	-CSA0	AU29	SA_CS#	AN2	MDA14
7	-CSA1	AV32	SA_CS#	AR1	MDA15
7	-CSA2	AW30	SA_CS#		
7	-CSA3	AU33	SA_CS#		
7	CKEA0	AV19	SA_CKE[0]	AW4	DQSA2
7	CKEA1	AT19	SA_CKE[1]	AW4	-DQSA2
7	CKEA2	AU18	SA_CKE[2]		
7	CKEA3	AV18	SA_CKE[3]		
	MODT_A0	AV31	SA_ODT[0]	AV2	MDA16
	MODT_A1	AU32	SA_ODT[1]	AW3	MDA17
	MODT_A2	AU30	SA_ODT[2]	AV5	MDA18
	MODT_A3	AW33	SA_ODT[3]	AW5	MDA19
7	DCLKA0	AY25	SA_CK[0]	AU2	MDA20
7	-DCLKA0	AW25	SA_CK[0]	AU3	MDA21
7	DCLKA1	AU24	SA_CK[1]	AU5	MDA22
7	-DCLKA1	AU25	SA_CK[1]	AY5	MDA23
7	DCLKA2	AW27	SA_CK[2]		
7	-DCLKA2	AY27	SA_CK[2]		
7	DCLKA3	AV26	SA_CK[3]		
7	-DCLKA3	AW26	SA_CK[3]		
7,8	-DDR3_RST	TR1	SM_DRAMRST#	AV8	DQSA3
	TBC9	0.1u4/X7R/16V/K/X		AW8	-DQSA3
	AV13	SA_DQS[8]		AY7	MDA24
	AV12	SA_DQS[8]		AU7	MDA25
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	AU14	SA_ECC_CB[1]		AU9	MDA27
	AW13	SA_ECC_CB[2]		AV7	MDA28
	AY13	SA_ECC_CB[3]		AW7	MDA29
	AU11	SA_ECC_CB[4]		AW9	MDA30
	AY12	SA_ECC_CB[5]		AY9	MDA31
	AW12	SA_ECC_CB[6]			
		SA_ECC_CB[7]			
	AR40	MDA40		AV37	DQSA4
	AR37	MDA41		AV36	-DQSA4
	AN38	MDA42			
	AN37	MDA43			
	AR39	MDA44			
	AR38	MDA45			
	AN39	MDA46			
	AN40	MDA47			
	AK38	DQSA6		AK36	-DQSA6
	AK39	-DQSA6			
	AL40	MDA48			
	AL37	MDA49			
	AJ38	MDA50			
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	AJ39	MDA54			
	AJ40	MDA55			
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	AG40	MDA56			
	AG37	MDA57			
	AE38	MDA58			
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CPU-SK/1155/S/15

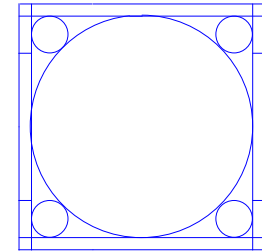
LGA1155B

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8	-SCASB	AK25	SB_CAS#	AM7	MDB9
8	-SRASB	AP24	SB_RAS#	AM10	MDB10
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8	SBAB1	AM26	SB_BS[1]	AL9	MDB14
8	SBAB2	AW17	SB_BS[2]	AM9	MDB15
8	-CSB0	AN25	SB_CS#	AR8	DQSB2
8	-CSB1	AN26	SB_CS#	AP8	-DQSB2
8	-CSB2	AL25	SB_CS#		
8	-CSB3	AT26	SB_CS#		
8	CKEB0	AU16	SB_CKE[0]	AP7	MDB16
8	CKEB1	AY15	SB_CKE[1]	AR7	MDB17
8	CKEB2	AW15	SB_CKE[2]	AP10	MDB18
8	CKEB3	AV15	SB_CKE[3]	AP10	MDB19
	MODT_B0	AL26	SB_ODT[0]	AP6	MDB20
	MODT_B1	AP26	SB_ODT[1]	AR6	MDB21
	MODT_B2	AM26	SB_ODT[2]	AP9	MDB22
	MODT_B3	AK26	SB_ODT[3]	AR9	MDB23
	AK21	SB_DQS[3]	SB_DQS[3]	AN13	DQSB3
	AK22	SB_DQS[3]	SB_DQS[3]	AN12	-DQSB3
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8	-DCLKB0	AL22	SB_CK[0]	AM13	MDB25
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8	DCLKB2	AL23	SB_CK[2]	AL12	MDB28
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	AP31	MDB41	SB_DQ[41]	AP35	MDB42
	AP35	MDB42	SB_DQ[42]	AP34	MDB43
	AP34	MDB43	SB_DQ[43]	AR32	MDB44
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	AL31	MDB55	SB_DQ[52]	AL31	MDB56
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	AL34	MDB59	SB_DQ[54]	AL34	MDB60
			SB_DQ[55]		
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	AG34	-DQSB7	SB_DQS[7]	AG34	-DQSB7
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	AH34	MDB57	SB_DQ[57]	AH34	MDB58
	AE34	MDB59	SB_DQ[58]	AE34	MDB60
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	AJ35	MDB63	SB_DQ[60]	AJ35	MDB64
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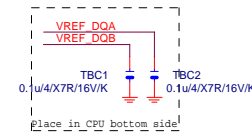
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CPU-SK/1155/S/15

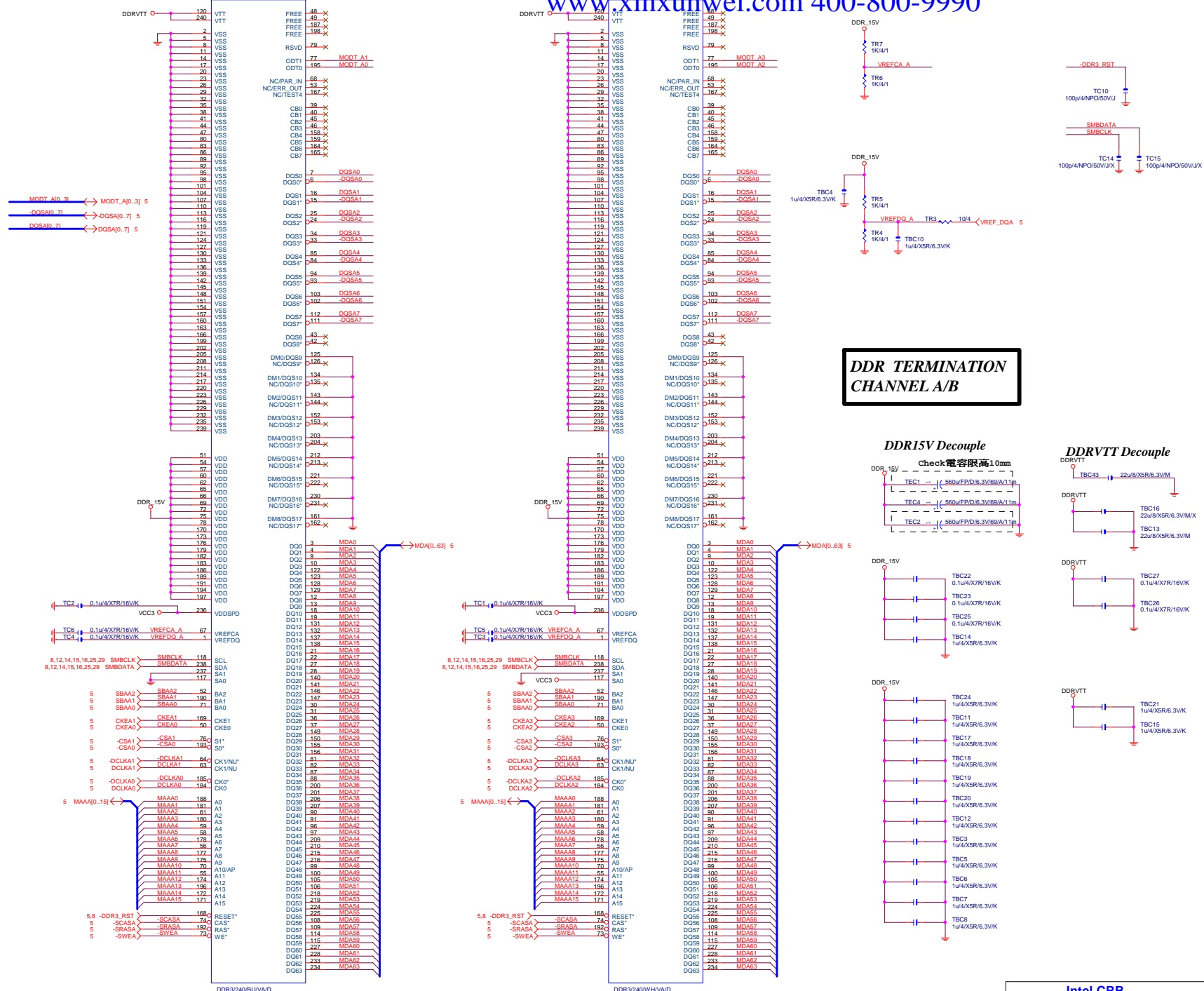
LGA1155
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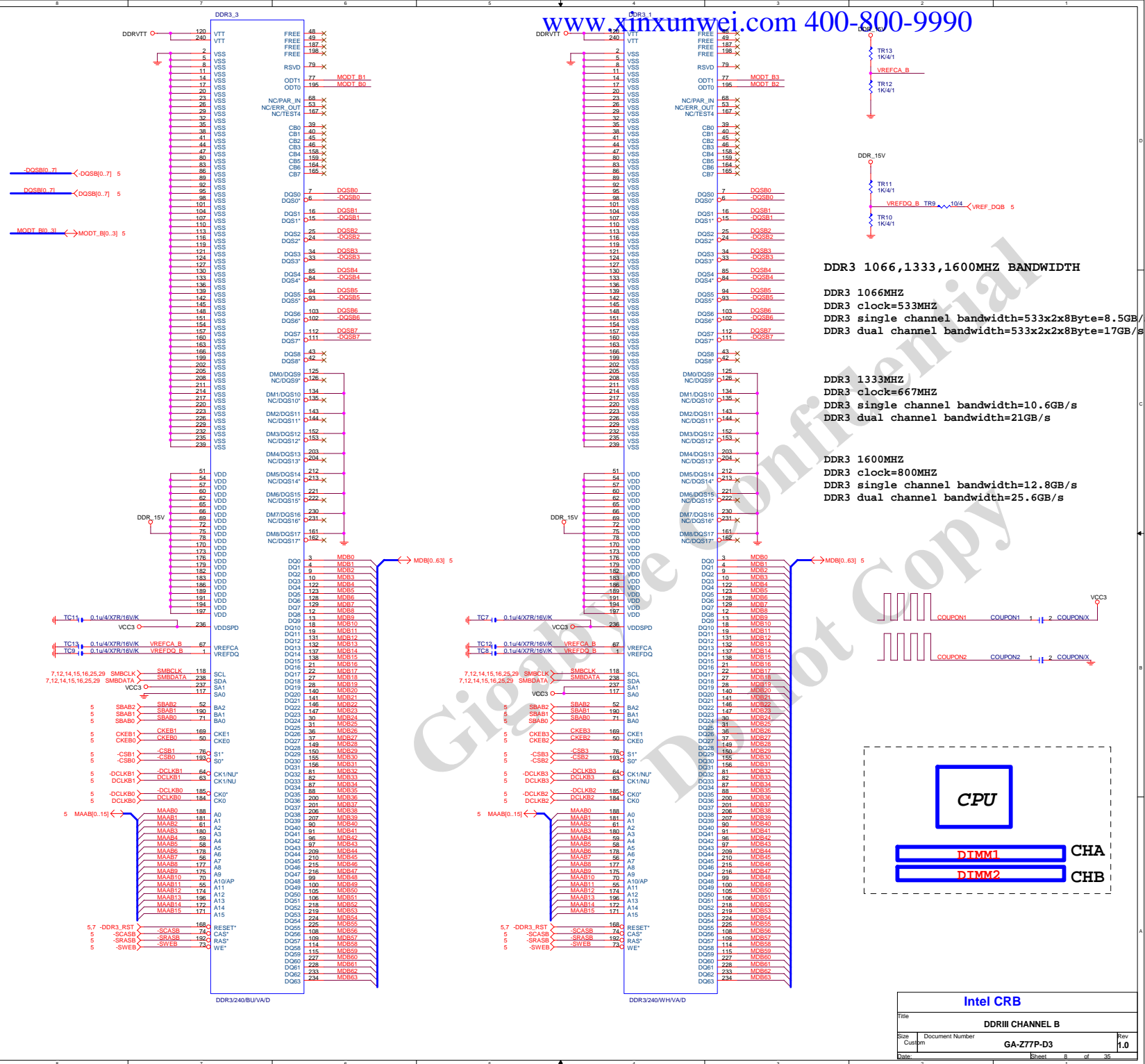
Need check the new CPU ME



Intel CRB

Title			CPU LGA1155-B		
Size			Document Number		
Custom			GA-Z77P-D3		
Date:			Monday, February 13, 2012		
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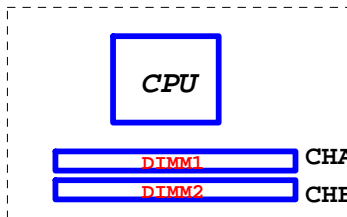
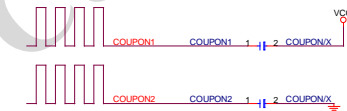


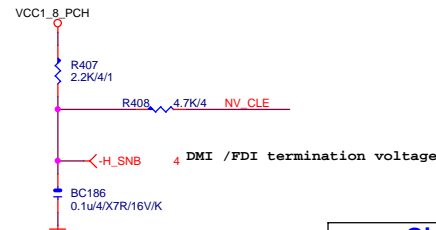
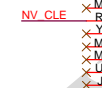
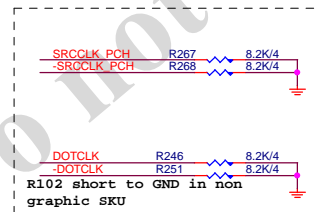
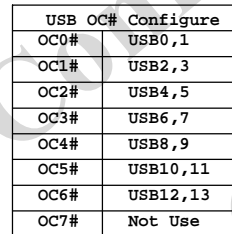
DDR3 1066,1333,1600MHZ BANDWIDTH

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

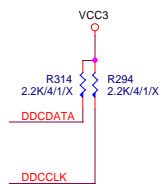
```
DDR3 1333MHZ
DDR3 clock=667MHZ
DDR3 single channel bandwidth=10.6GB/s
DDR3 dual channel bandwidth=21GB/s
```

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





Title				PCH FDI,DMI,USB ,PCIE			
Size	Custom	Document Number				Rev	1.0
		GA-Z77P-D3					
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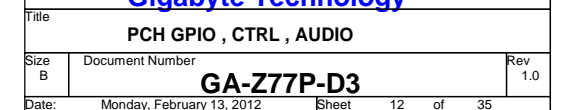


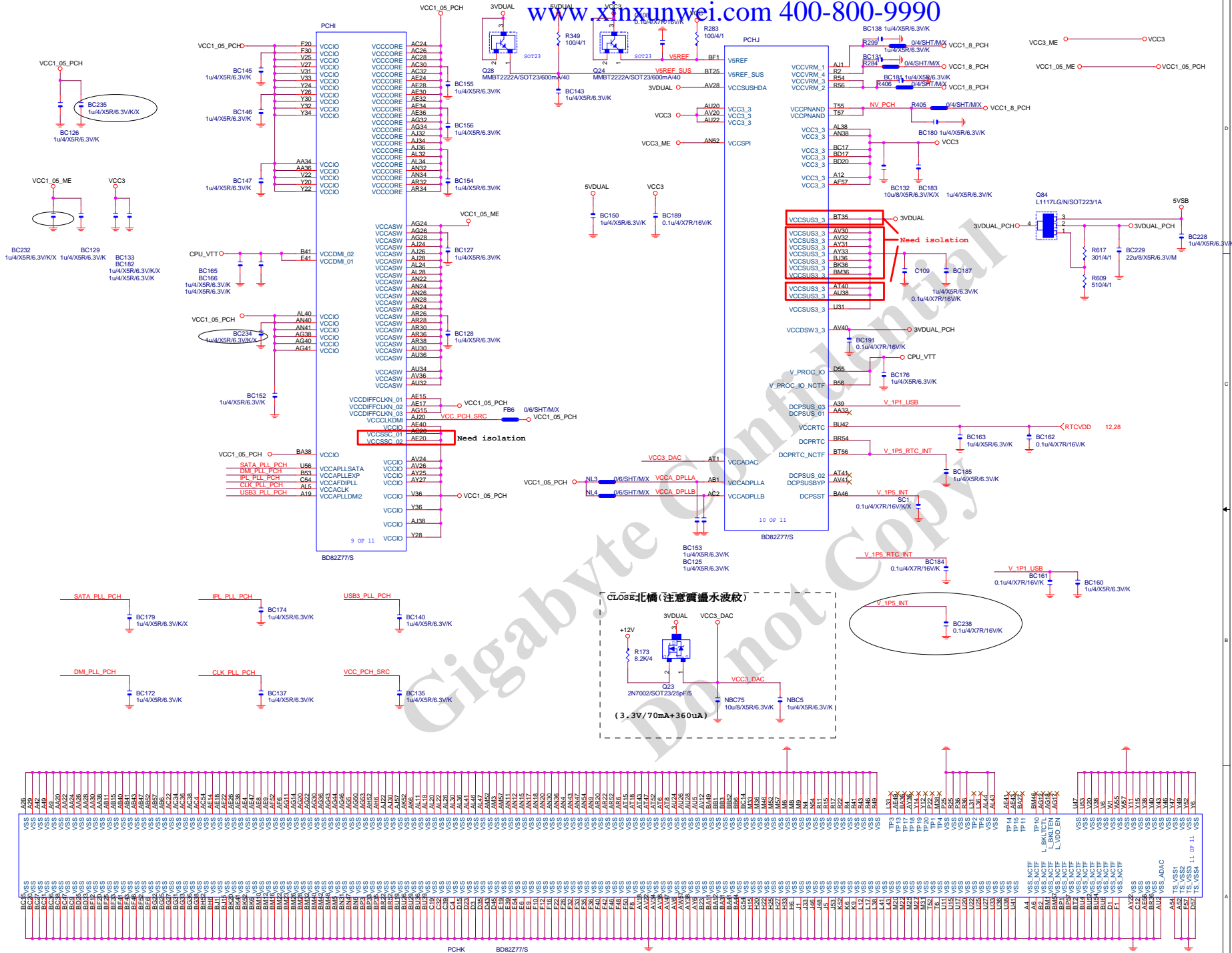
www.xinxunwei.com 400-800-9990

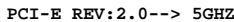
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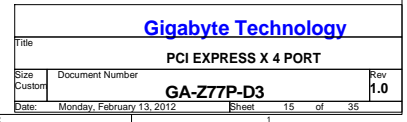
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PCH HOST , SATA, PCI				
Size B	Document Number			Rev 1.0
GA-Z77P-D3				
/A/D1/B				
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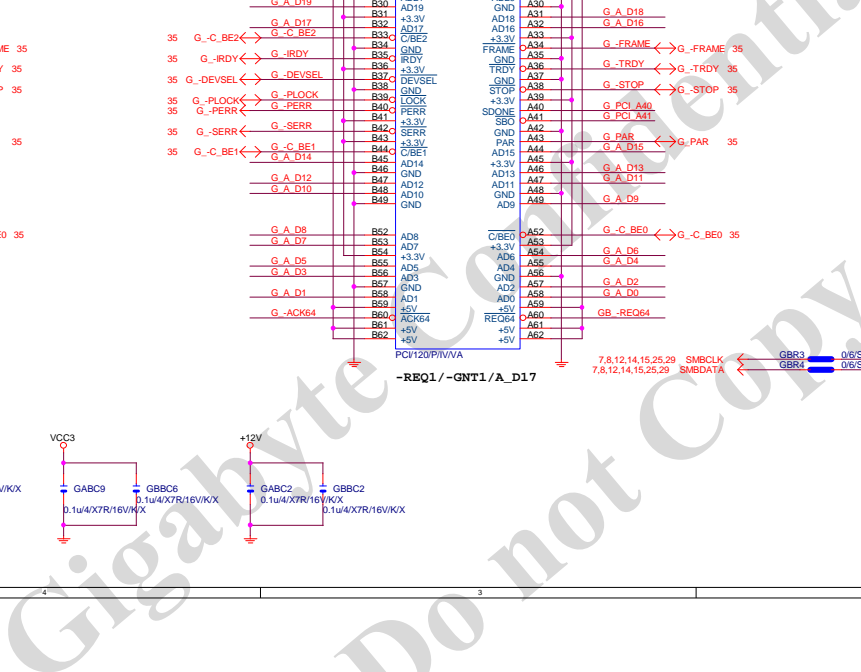
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Title PCH HOST , SATA, PCI			
Size B	Document Number GA-Z77P-D3		Rev 1.0
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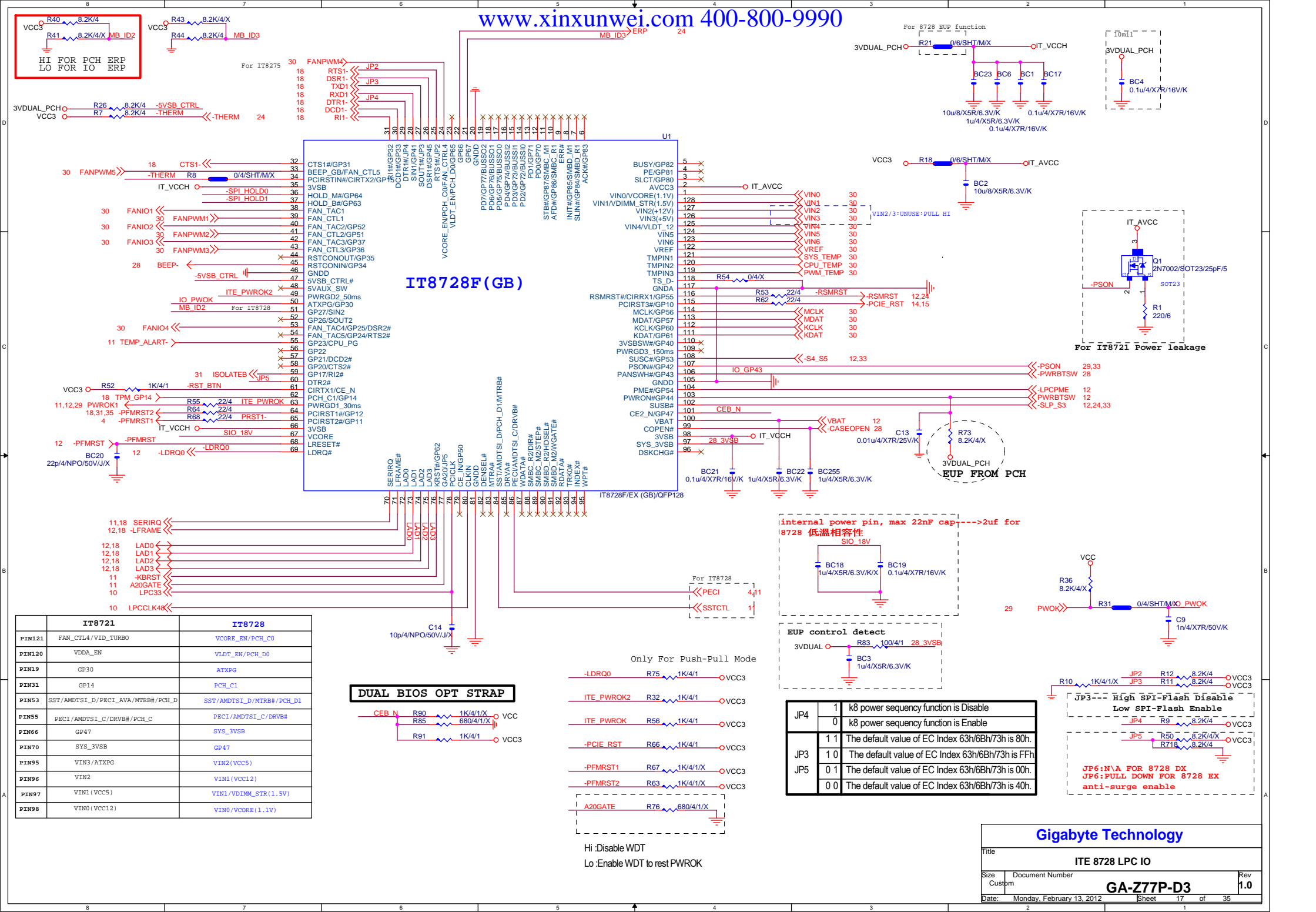


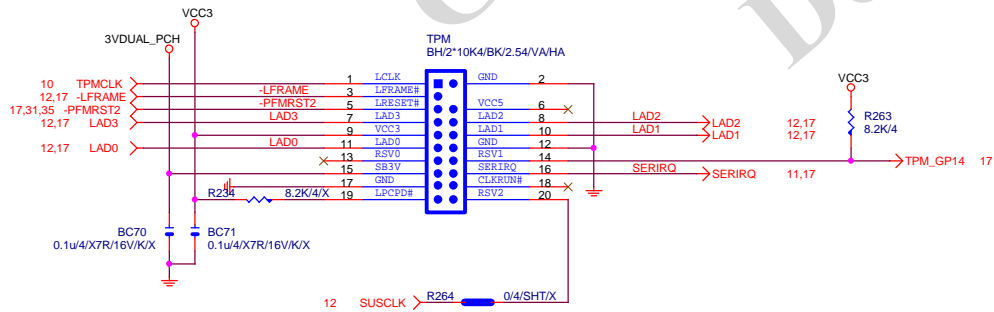
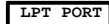
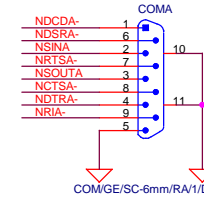
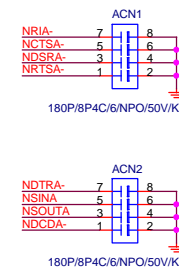
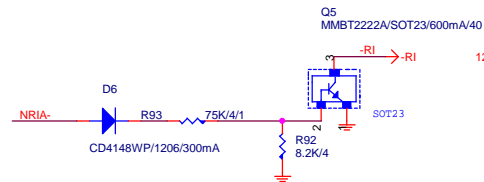


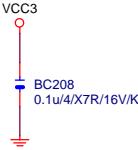




PCB layout showing the connection of the Giga-byte Pro 1000 Ethernet controller to the PC120P1WVA connector. The diagram includes a detailed pinout table for the connector and the Ethernet controller, showing signal names like G_A_D17, G_C_BE2, G_IRDY, G_DEVSEL, G_PLOCK, G_PERR, G_SERR, G_C_BE1, G_A_D12, G_A_D10, G_A_D8, G_A_D7, G_A_D6, G_A_D5, G_A_D3, G_A_D1, G_ACK64, G_C_BE0, G_A_D6, G_A_D4, G_A_D2, G_A_D0, GB_REQ64, GB_B1, GB_B0, and GB_A1. It also shows power connections for VCC3 and +12V, and ground connections for GND. The connector is labeled PC120P1WVA and the Ethernet controller is labeled -REQ1/-GNT1/A_D17.



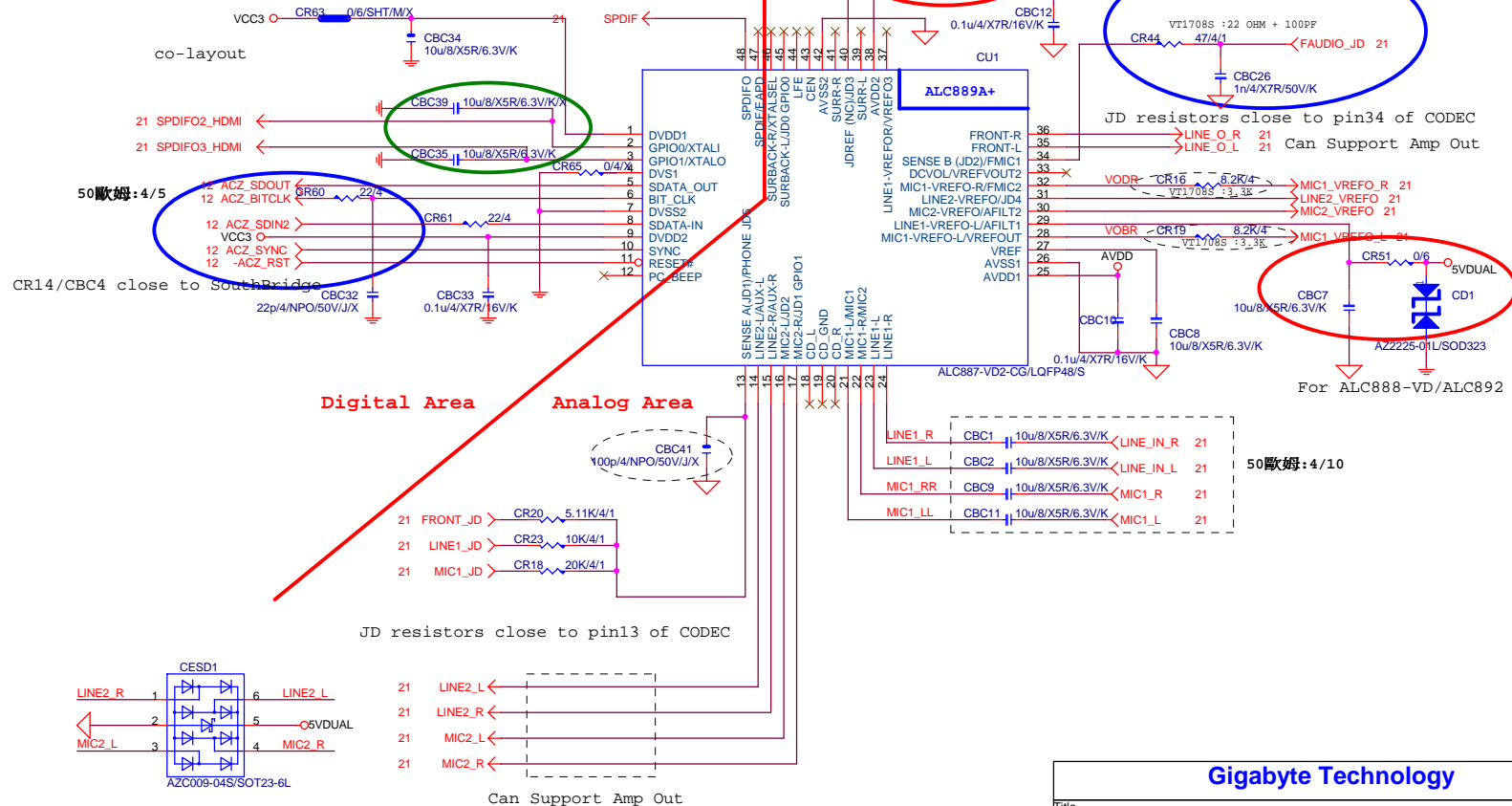




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Do not Copy

Gigabyte Technology			
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	ALC662	ALC887-VD2	ALC889	VT1708S-CD	VT1708S-CE	VT2021
CR65	X	X	O	O	X	O
CBC35	O	O	X	X	O	X
CR44/CBC26	47ohm+1nF	47ohm+1nF	47ohm+1nF	22ohm+100P	22ohm+100P	47ohm+1nF
CR31	X	O	O	O	O	O
CR30	O	X	X	X	X	X
CBC1/CBC2	10uF/X5R	10uF/X5R	22uF/X5R	10uF/X5R	10uF/X5R	10uF/X5R
CR20	5.11K/4/1	5.11K/4/1	5.11K/4/1	5.1K/4/1	5.1K/4/1	5.1K/4/1
CR34	20K/4/1	20K/4/1	20K/4/1	5.1K/4/1	20K/4/1	5.1K/4/1
CBC40/CBC41	X	X	X	100P/4	100P/4	X
CR6/CR7/CR58/CR54	22K/4	22K/4	22K/4	10K/4/1	10K/4/1	10K/4/1
CR5/CR8/CR1/CR14/ CR17/CR22/CR13/CR11/ CR57/CR53	62 ohm	62 ohm	62 ohm	75 ohm	75 ohm	75 ohm
CR51/CD1/CBC7	O	O	X	X	O	O
CD2/CD3/CQ5/CQ5	X	X	O	O	X	X



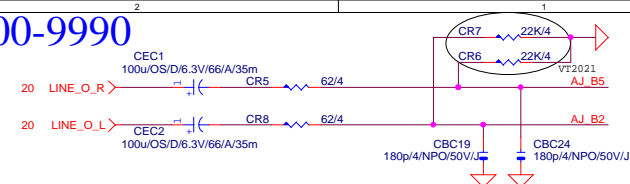
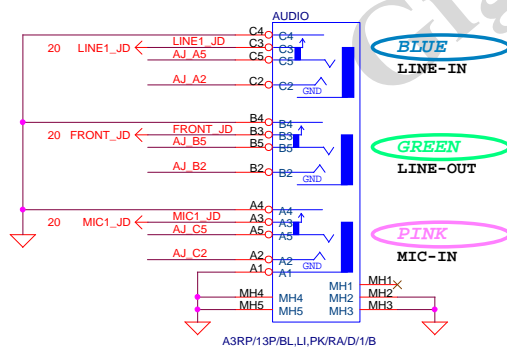
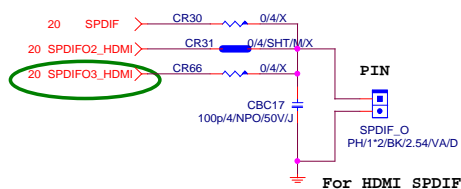
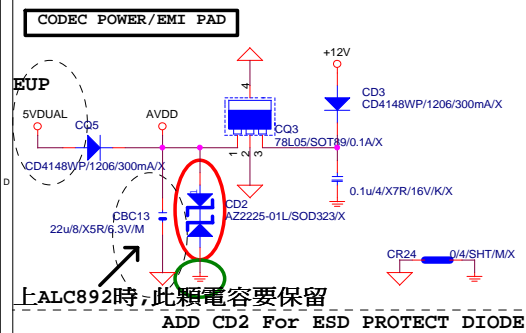
Gigabyte Technology

Title HD AUDIO ALC887

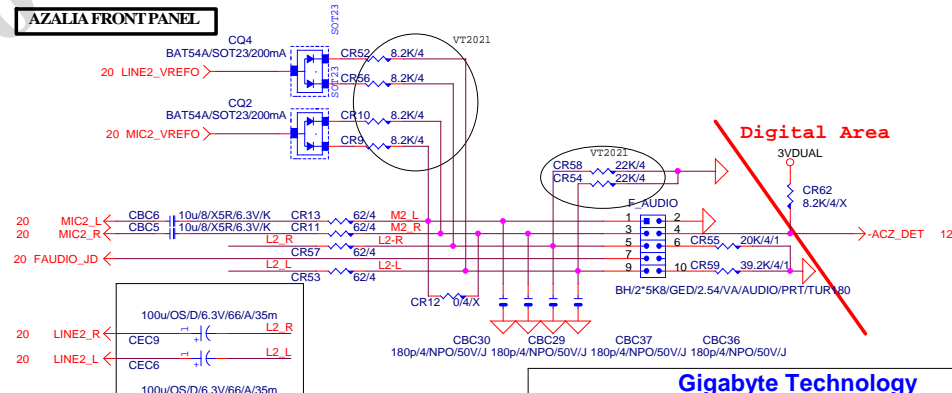
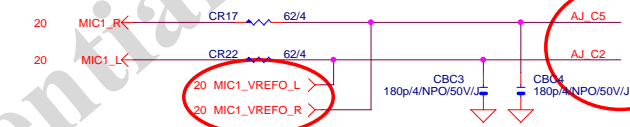
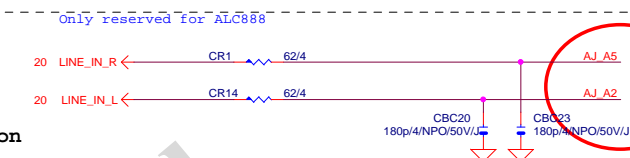
Size Document Number GA-Z77P-D3

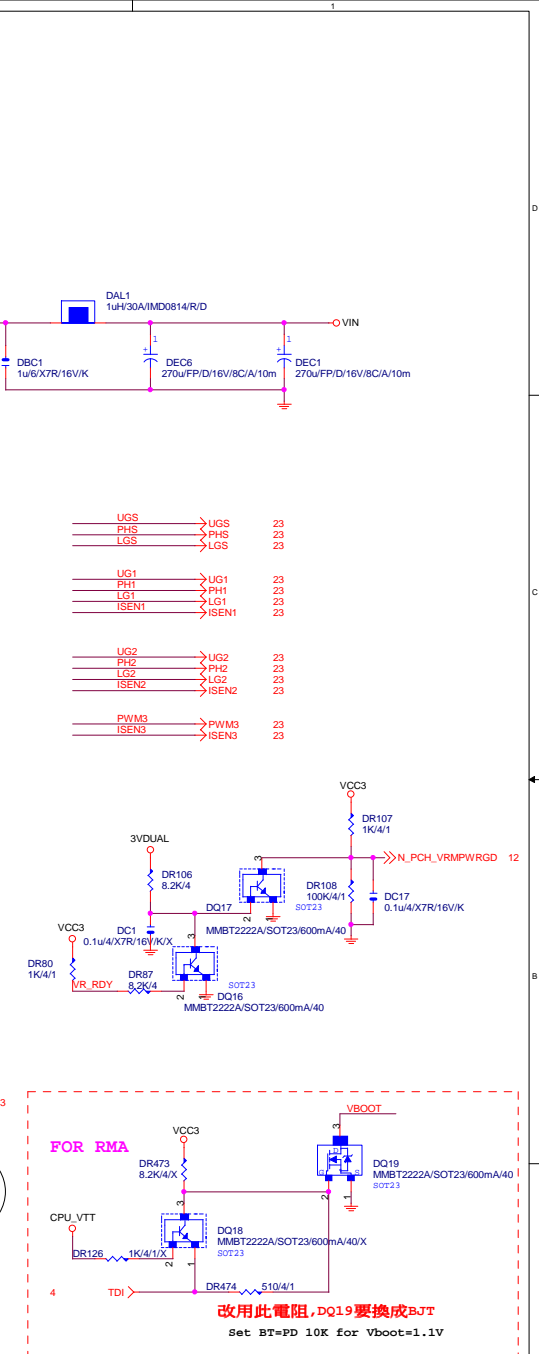
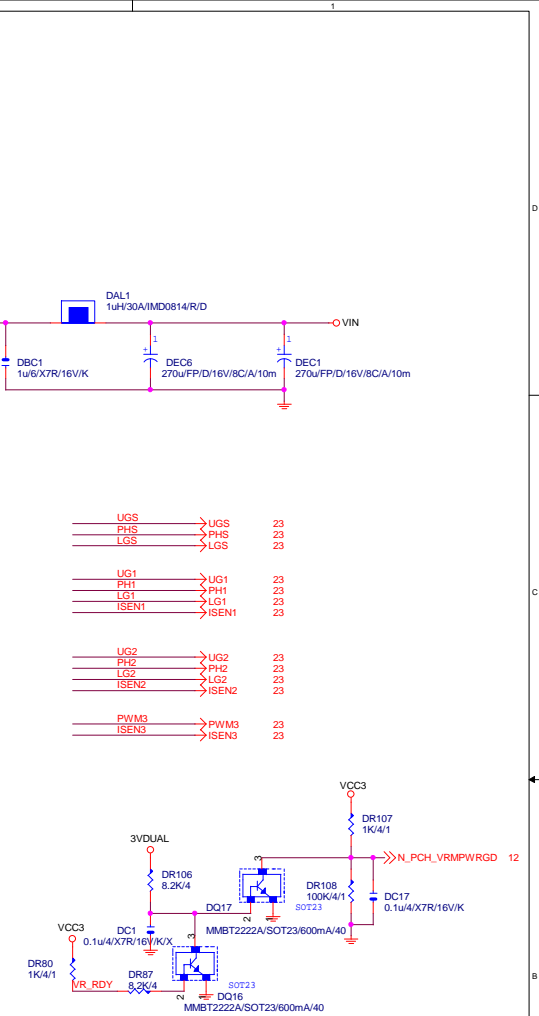
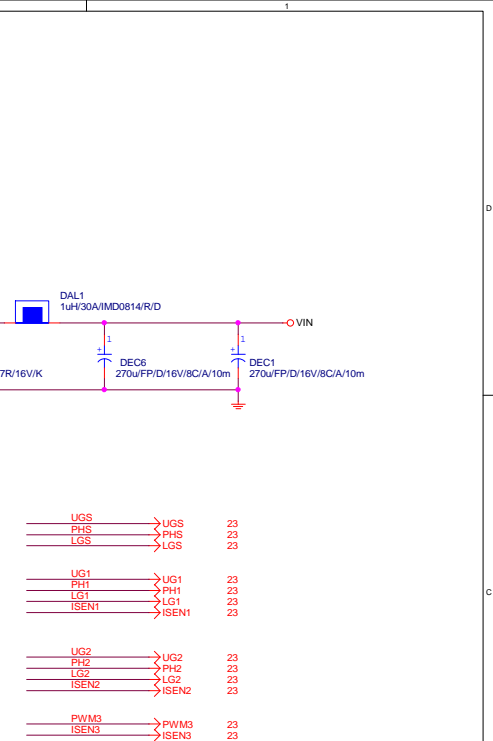
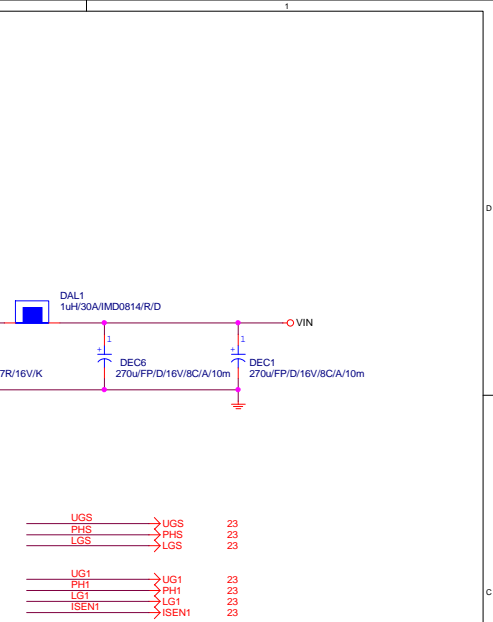
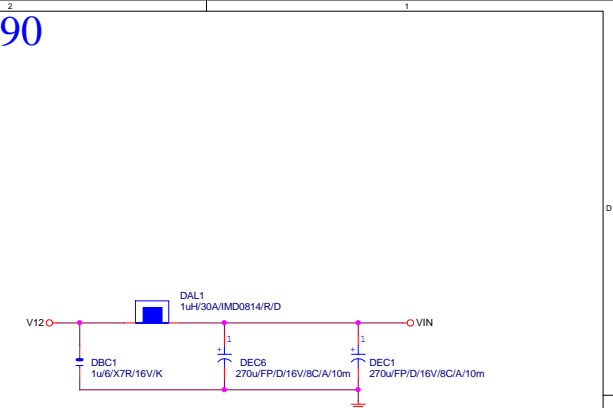
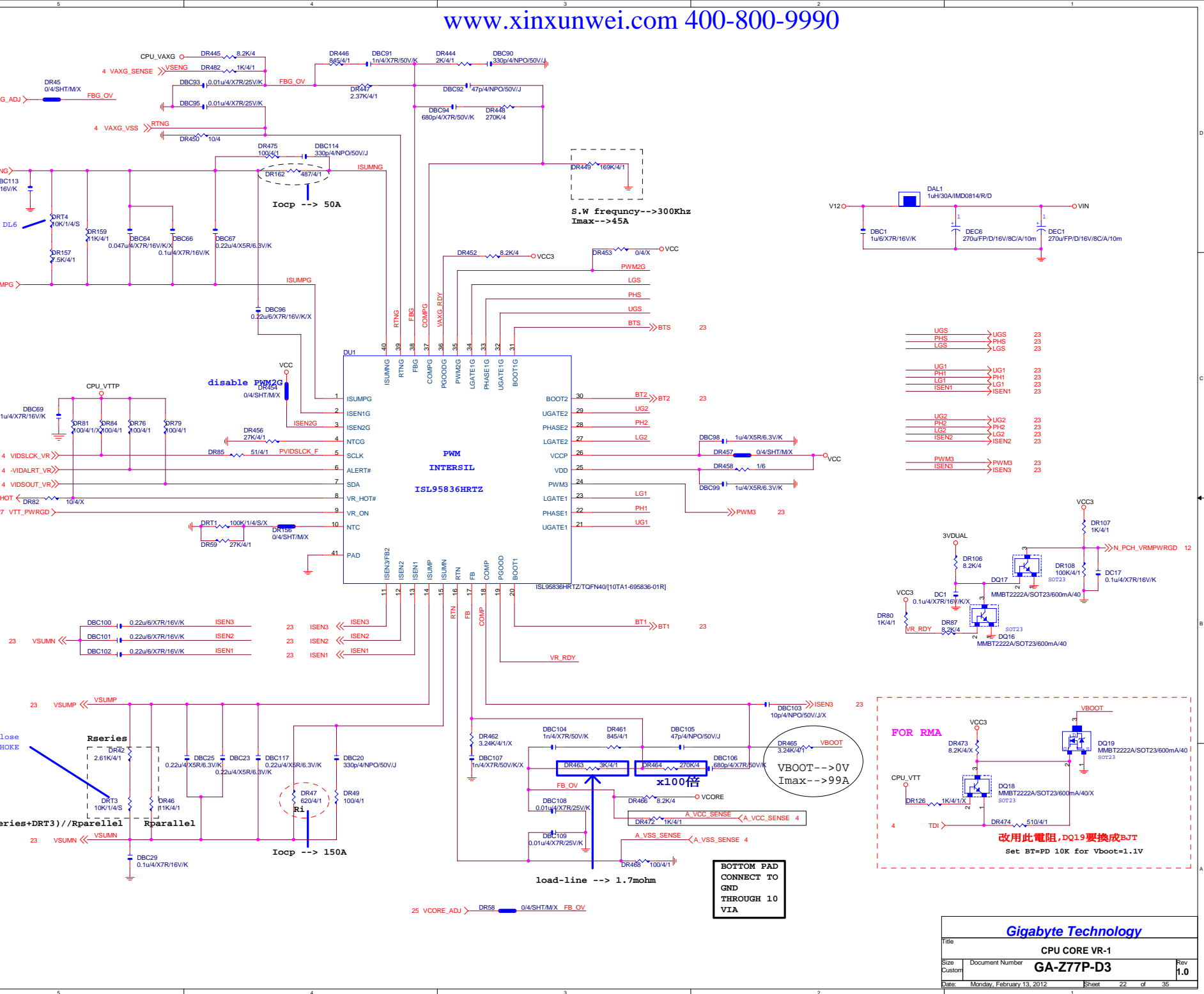
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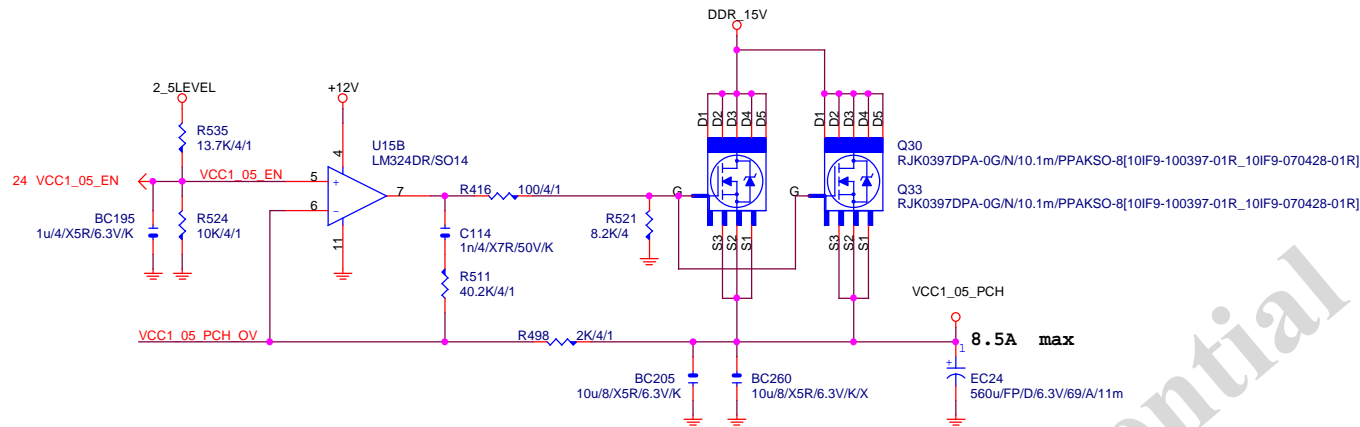


Verify MIC function
in LINE-in



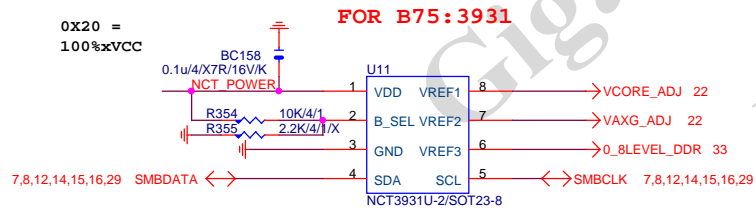
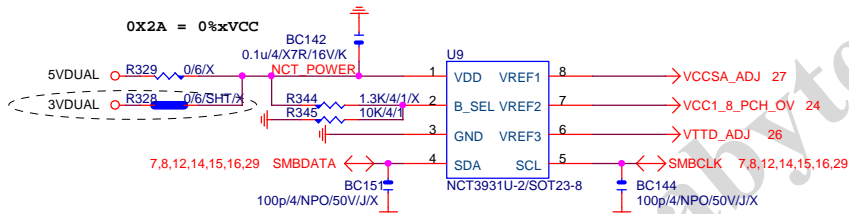


VCC1_05_PCH



Voltage console

ADDRESS	0X2A	0X20	0X22	0X26
R1 (K)	OPEN	10	1.3	3
R2 (K)	10	OPEN	3.9	2.2
%VCC	0	100	75	42

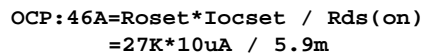


up6262	0X2A	0X20
VREF1	VCC1_05_PCH	VCORE
VREF2	VCC1_8_PCH	VCCSA
VREF3	CPU_VTT	DDR

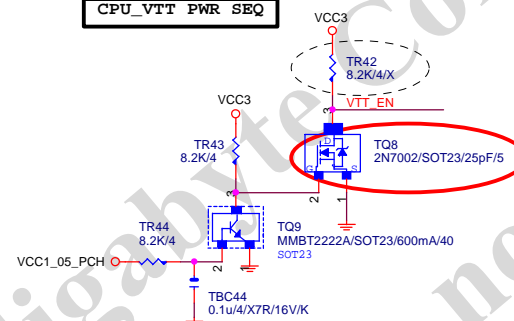
Gigabyte Technology

Title	PCH CORE / VOLTAGE CONSOLE		
Size B	Document Number	GA-Z77P-D3	Rev 1.0

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CPU_VTT PWR SEQ

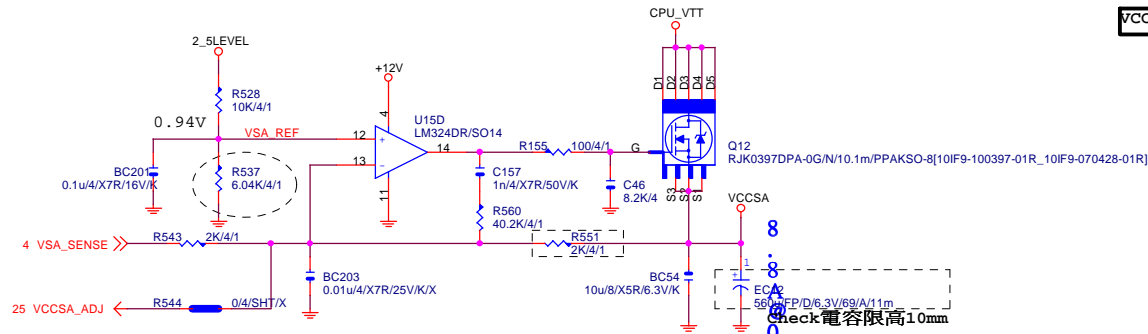


	VTT_SEL
HI	1.05V
LO	1.0V

According intel
CDI/IBP#476733, 固定1.05V

Check 電容限高10mm

VCC_SA



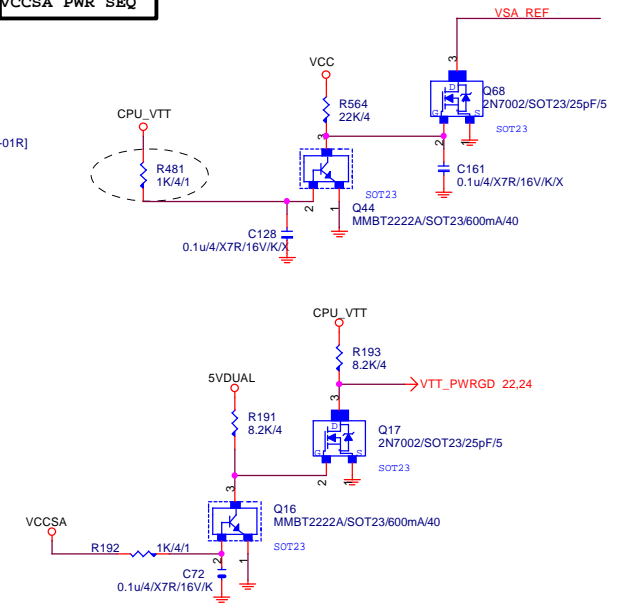
PDG 1.01

	VSA_SEL
HI	0.85V
LO	0.925V

According intel
CDI/IBP#476733, 固定0.925V

8
.
8
5
/
0
:
9
2
5
V

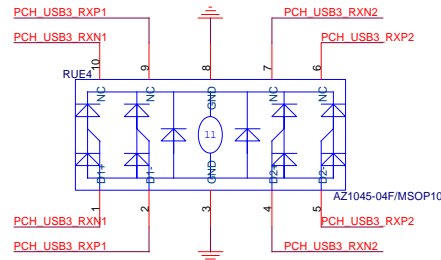
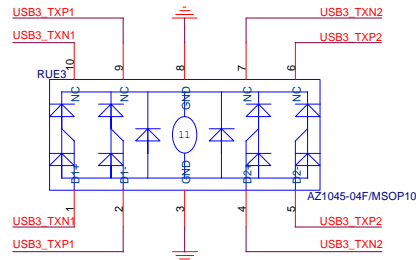
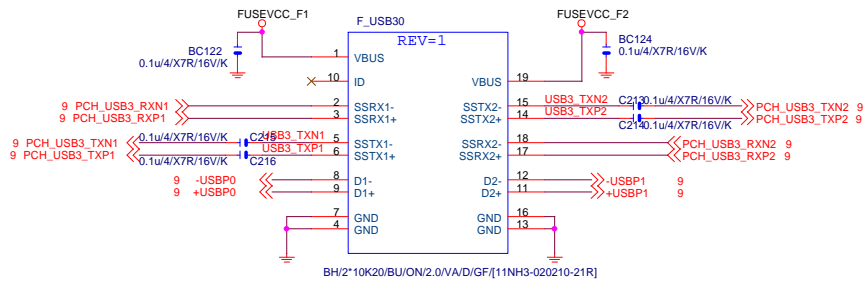
VCCSA PWR SEQ



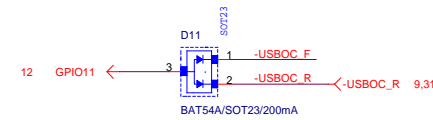
Gigabyte Technology

Title		
VCCSA POWER		
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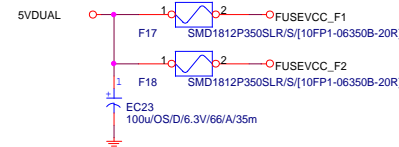
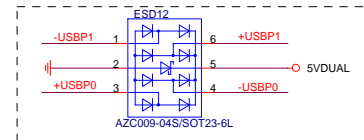
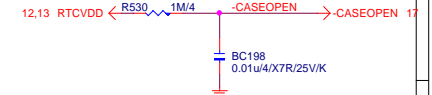
FRONT USB1



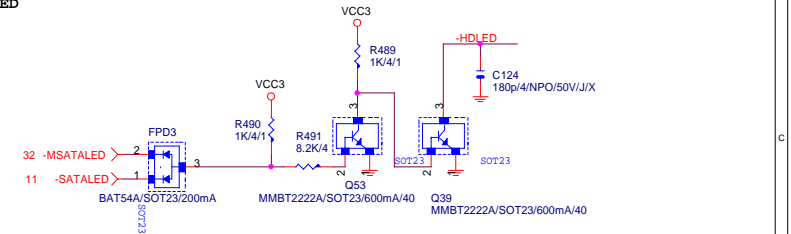
F_USB POWER PROTECT



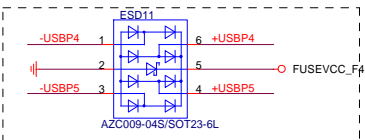
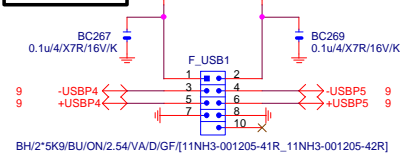
CASE OPEN



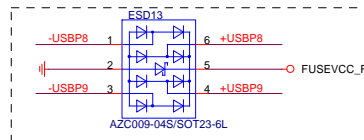
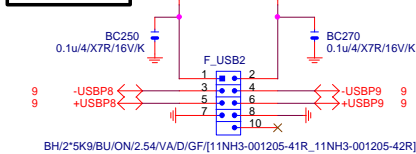
SATA LED



FRONT USB1

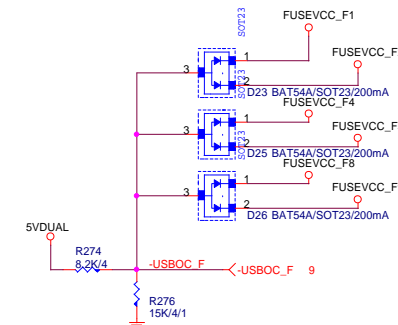
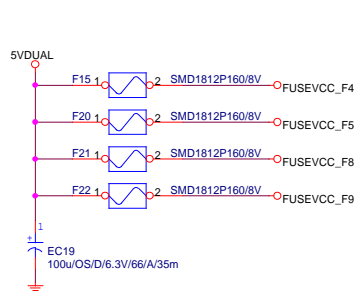


FRONT USB2

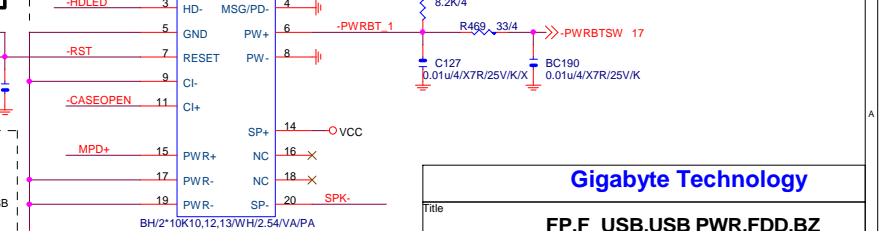
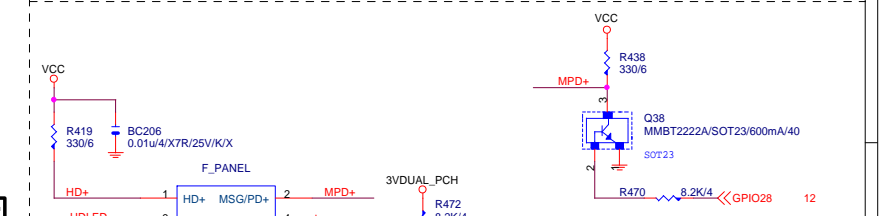
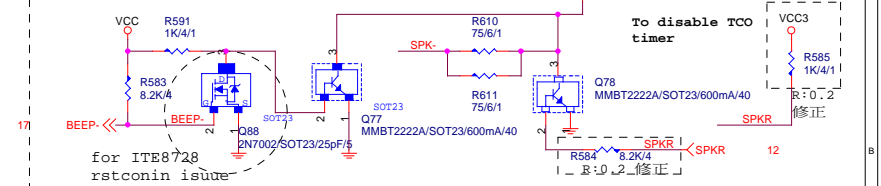
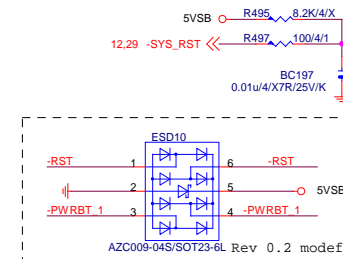


ESD Close to connector

ESD Close to connector

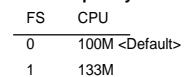


INTEL FRONT PANEL



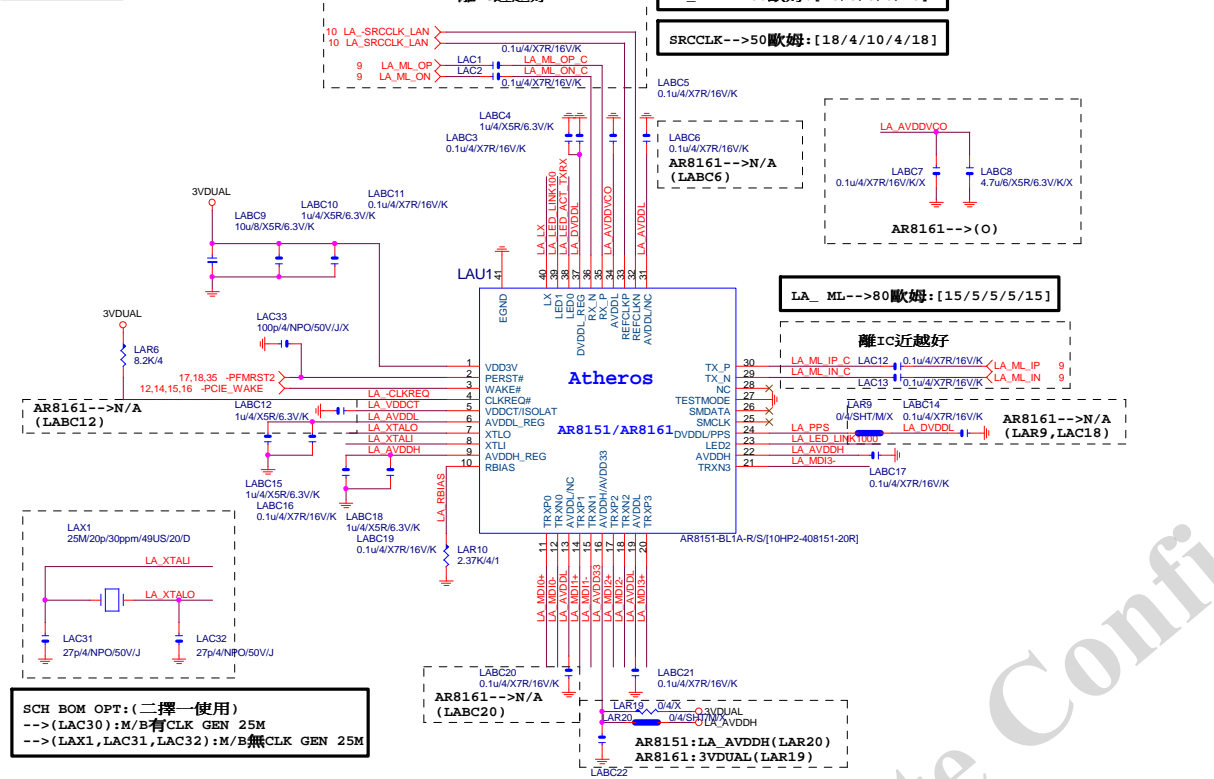
Gigabyte Technology

Title			FF,P_USB,USB PWR,FDD,BZ		
Size			GA-Z77P-D3		
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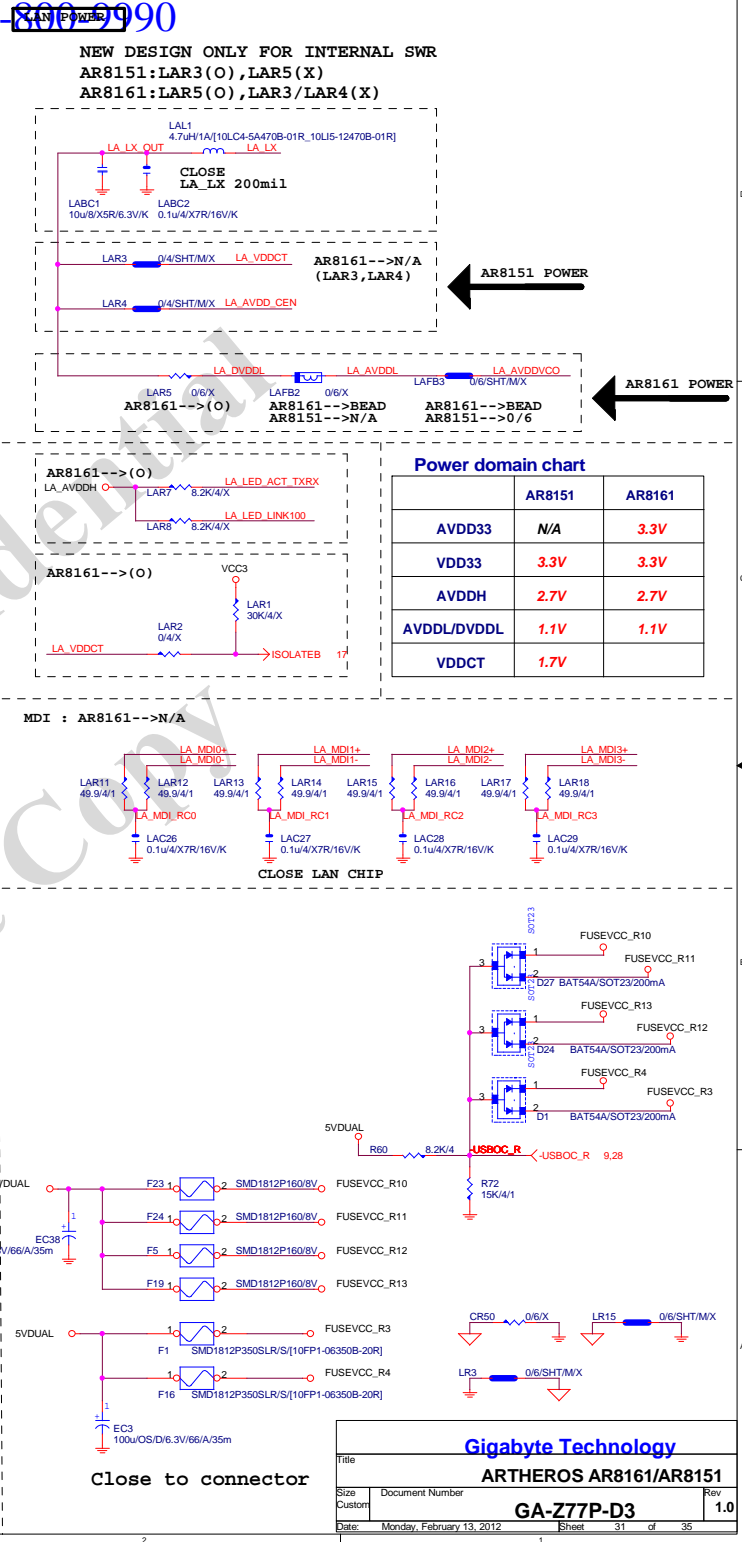
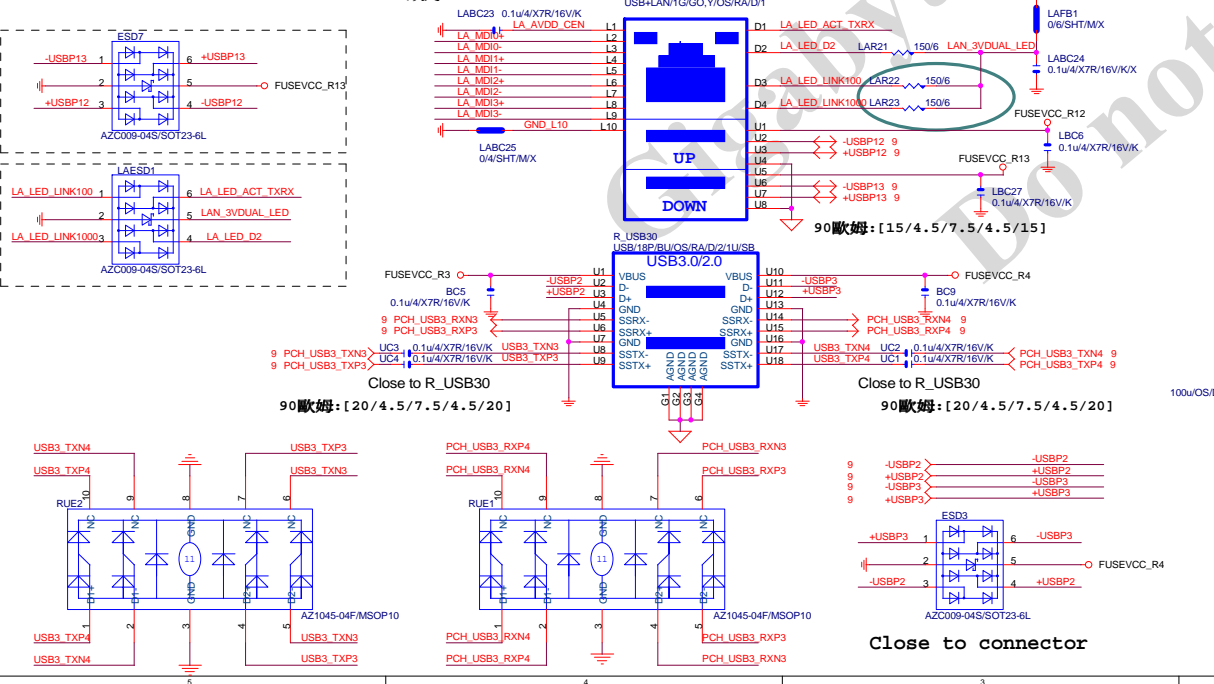


Title			
ATX POWER CONNECTOR			
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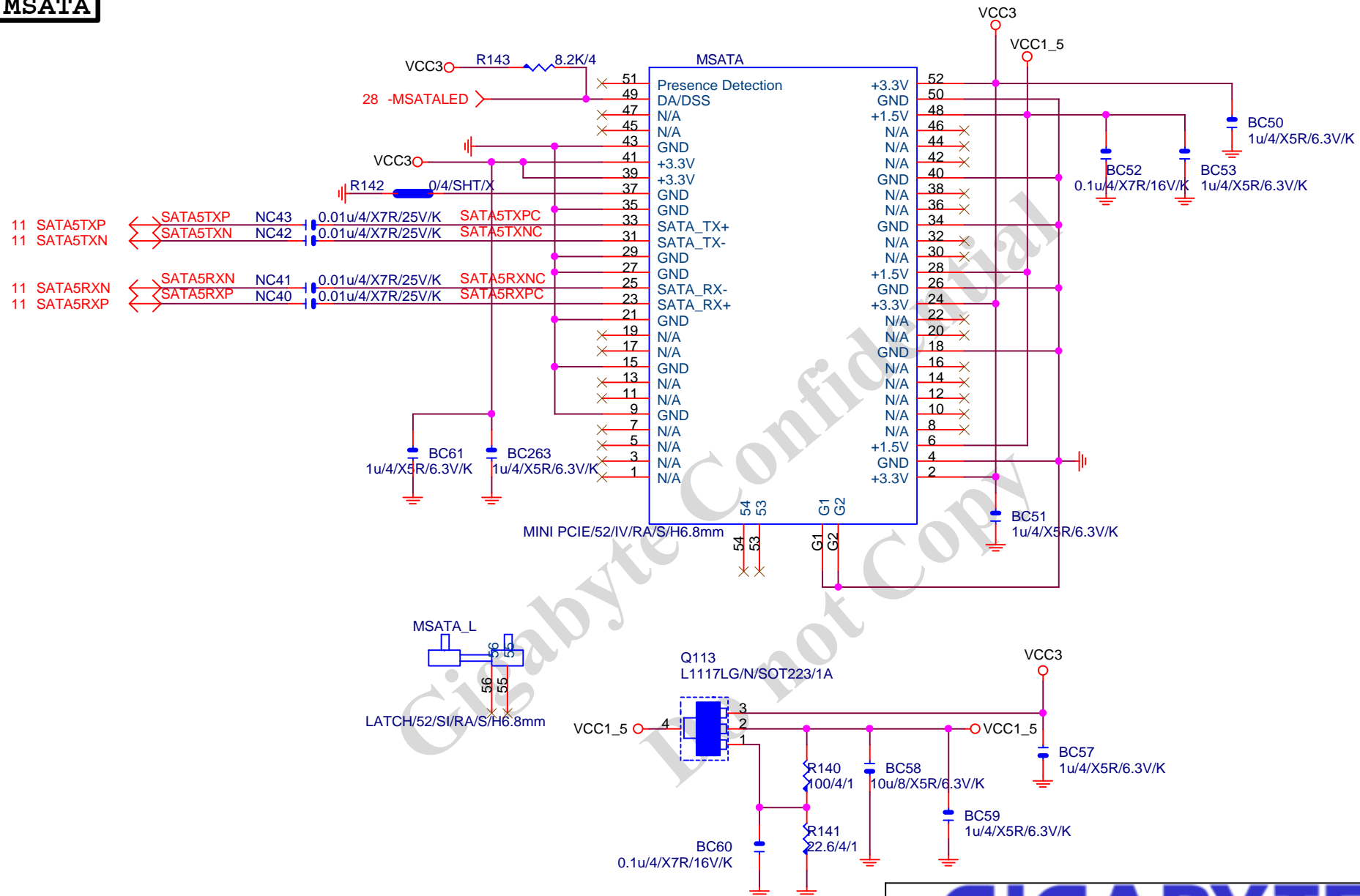
PCIE-1G LAN



USB30 LAN CONNECTOR



MSATA



GIGABYTE™

Title

MSATA

Size	A
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Document Number

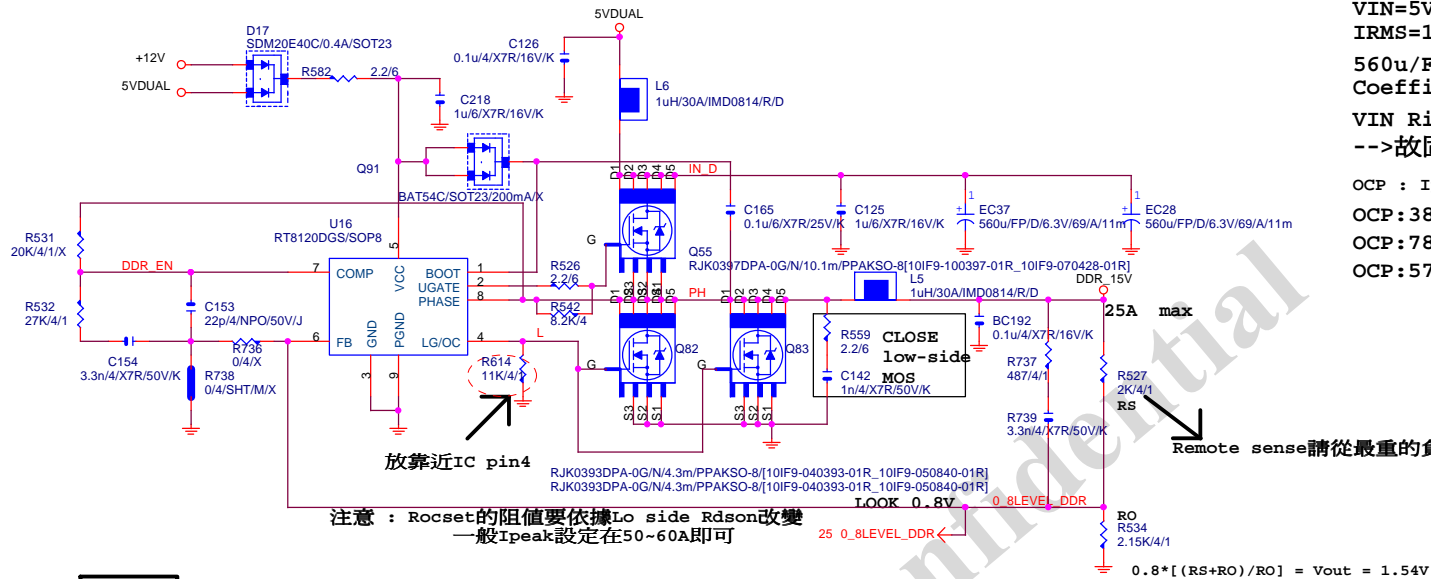
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DDR18V



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=(2xIocsetxRoset)/Rds(on)
OCP:38.31A for Rds=6.7m for vishay@4.5V
OCP:78.78A for Rds=3.3m for renesas@10V
OCP:57A=Roset*Iocset / Rds(on)
      =11K*10uA / [5//5]
```

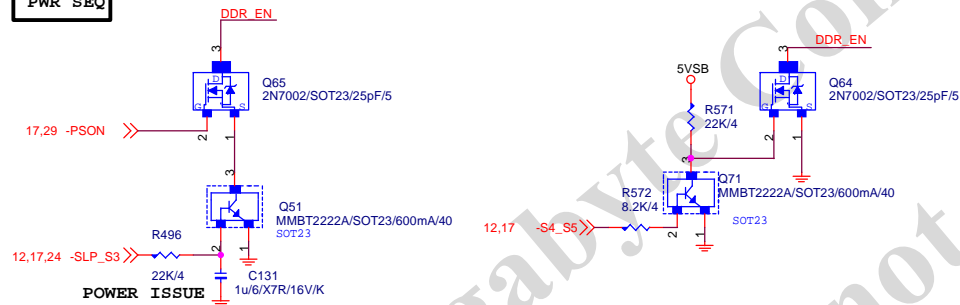
Remote sense請從最重的負載端點拉回

注意：Rocset的阻值要依據Lo side Rdson改變
一般Ipeak設定在50~60A即可

25 0_8LEVEL_DDR ←

$$0.8 * [(R_S + R_O) / R_O] = V_{out} = 1.54V$$

PWR	SEQ
-----	-----



POWER ISSUE 1u/6/X7R/16V/K

12,17,24 -SLP_S3 >>>

17,29 -PSON >>————

5VSB

R571 22K/4

Q71 MMBT2222A/SOT23/600mA/40

R572 8.2K/4

SOT23

Q64 2N7002/SOT23/25pF/5

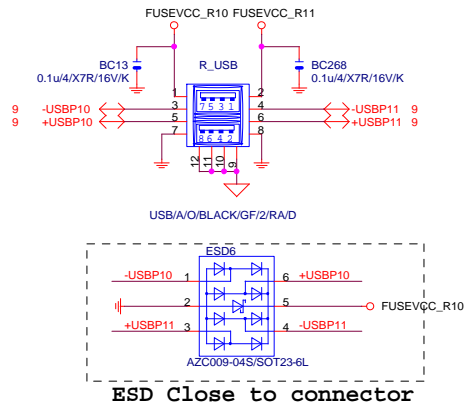
DDR_EN

12,17 -S4_S5

GIGABYTE™

Title			
RT8120			
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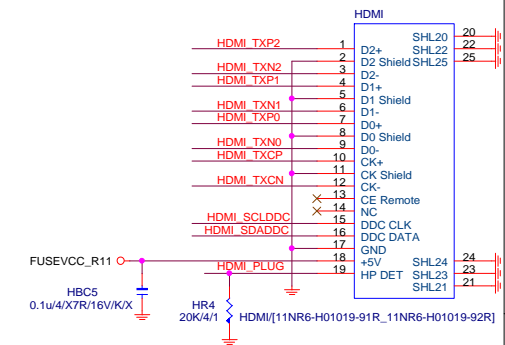
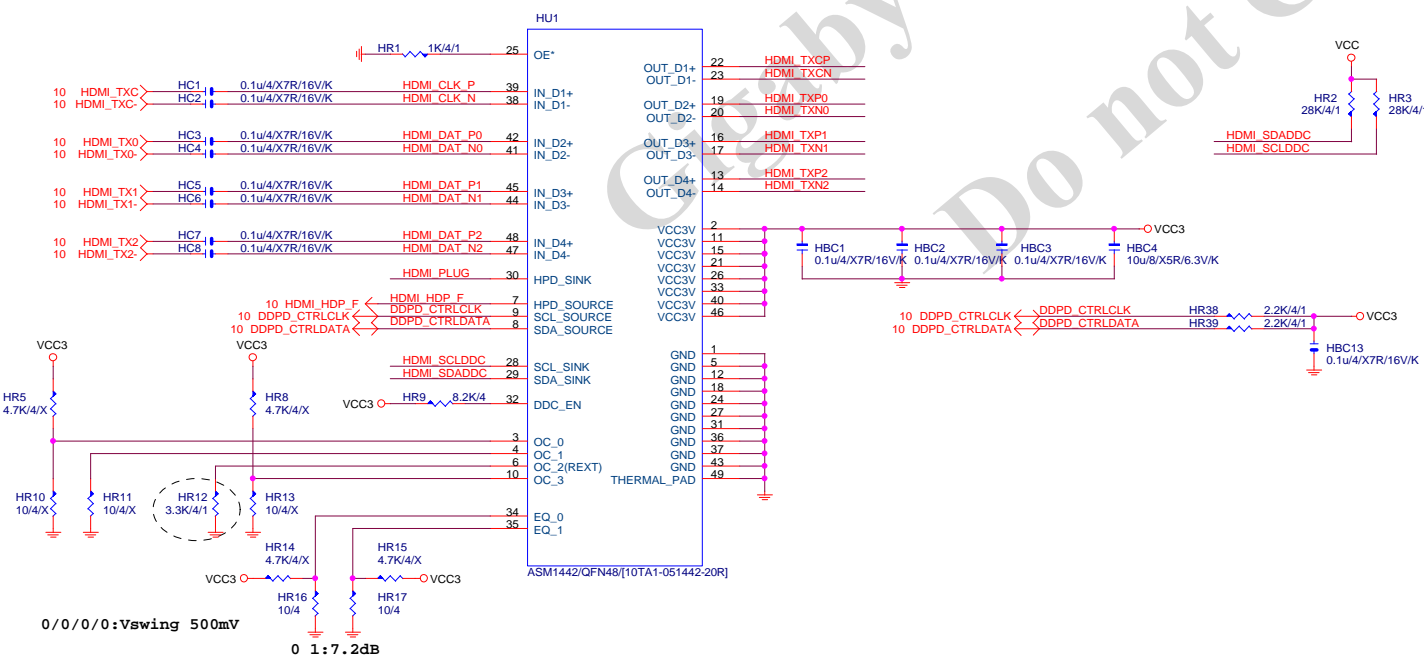
R_USB



HDMI LEVEL SHIFT

HDMI: 20/4/6/4/20

Impedance=85 +- 17.5%



Gigabyte Technology

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DVI			
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