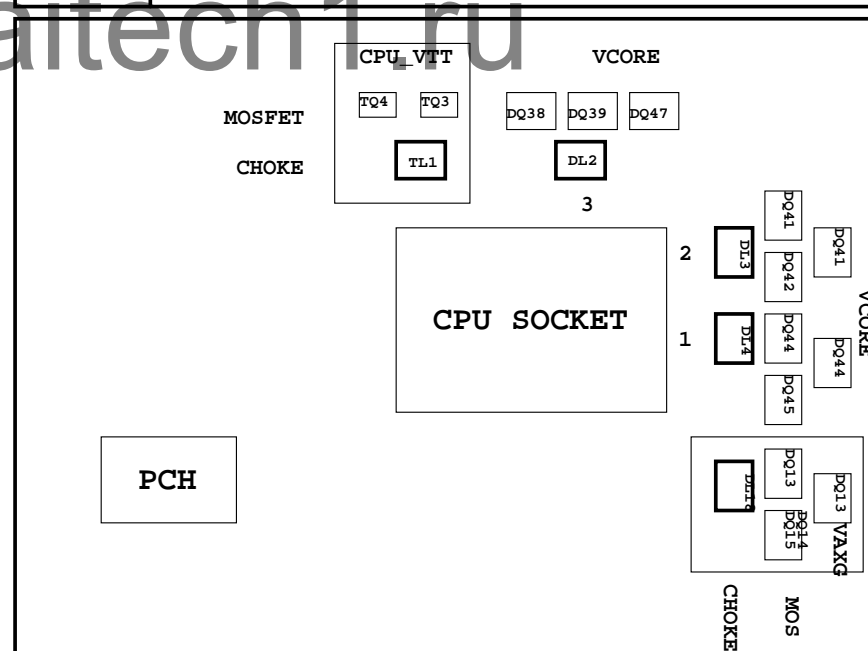


SHEET TITLE

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, LPT, TPM
19	Dual BIOS
20	VIA2021
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	DVI
35	
36	
37	
38	
39	
40	



GA-H77-DS3H-TW

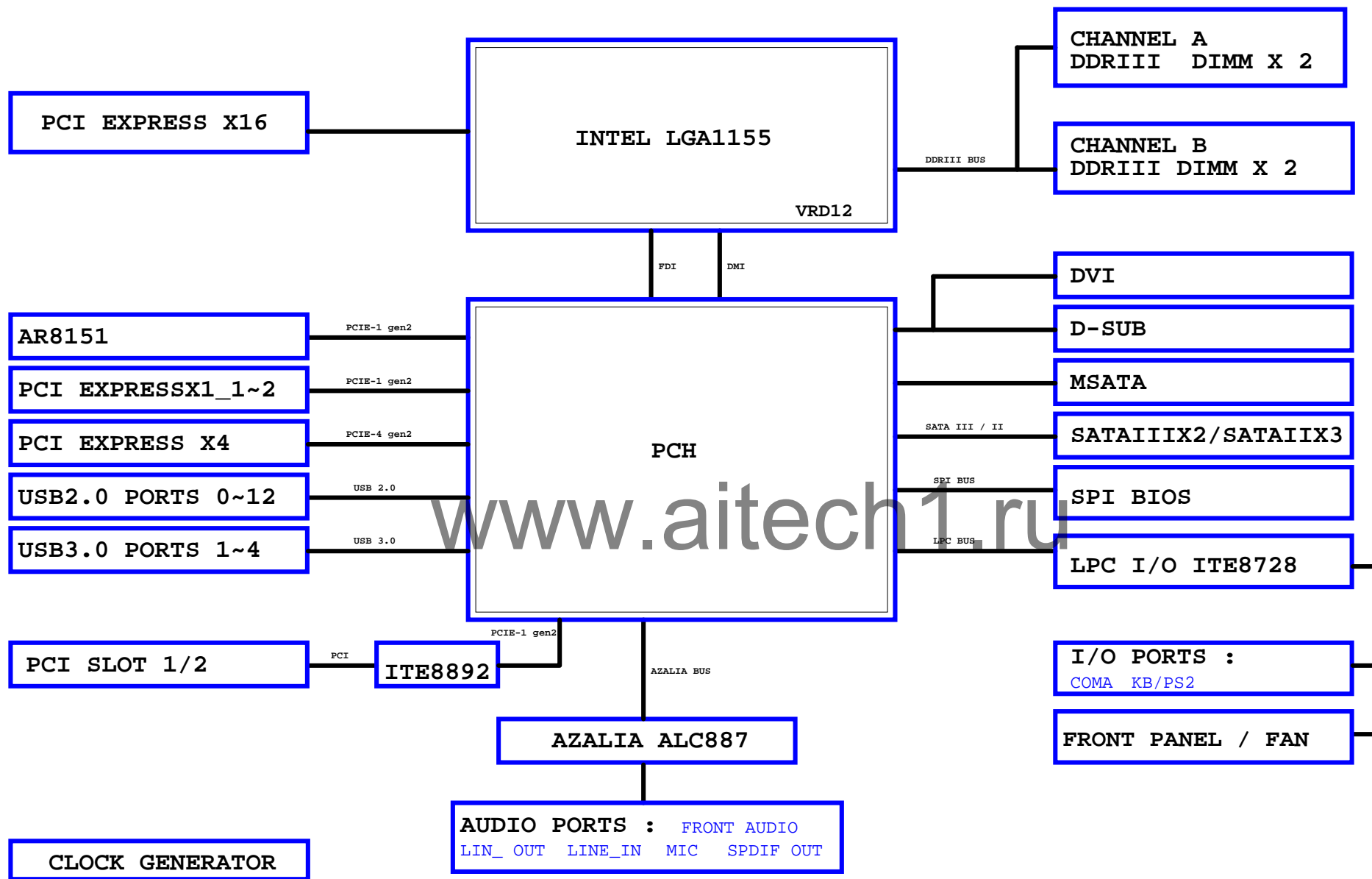
Component value change history

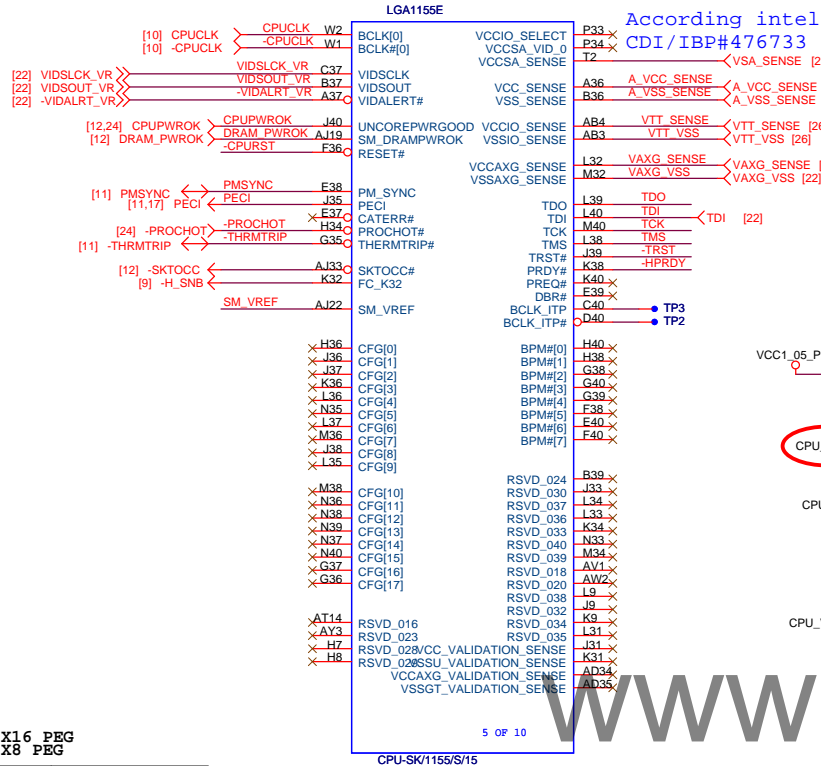
[illegible]

Circuit or PCB layout change

[illegible]

BLOCK DIAGRAM



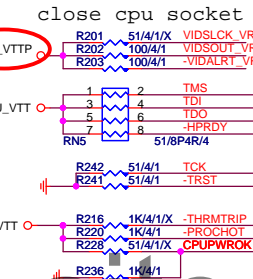
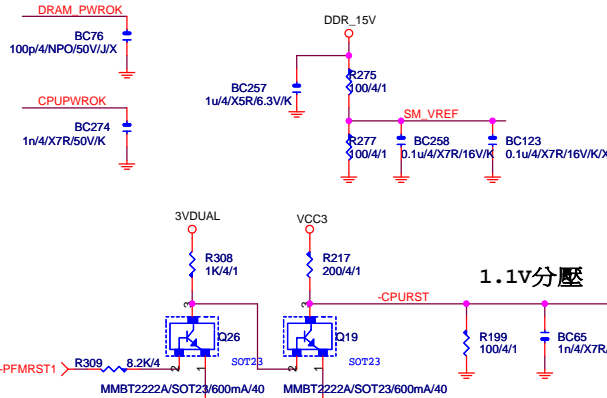


CFG5:1: 1X16 PEG
CFG5:0: 2X8 PEG

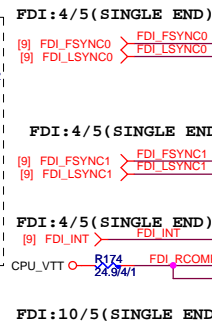
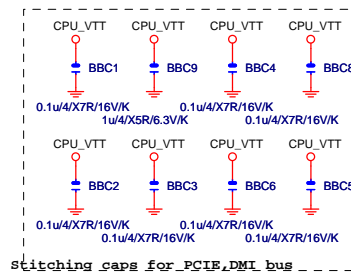
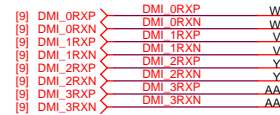
CFG	H	L	NOTE
0	RSVD	RSVD	RSVD
1	RSVD	RSVD	RSVD
2	NORM	Reverse	LANE REVERSAL[0],x16
3	RSVD	RSVD	RSVD
4	RSVD	RSVD	RSVD
7	RSVD	RSVD	RSVD
8	RSVD	RSVD	RSVD
9	RSVD	RSVD	RSVD
10	RSVD	RSVD	RSVD
11	RSVD	RSVD	RSVD
12	RSVD	RSVD	RSVD
13	RSVD	RSVD	RSVD
14	RSVD	RSVD	RSVD
15	RSVD	RSVD	RSVD
16	RSVD	RSVD	RSVD
17	RSVD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

CFG6	CFG5	PCIE CONFIG
1	1	1X16, Default
1	0	2X8
0	1	RSVD
0	0	X8,X4,X4

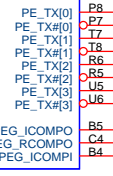
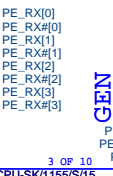
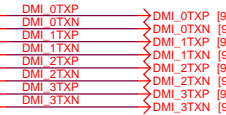
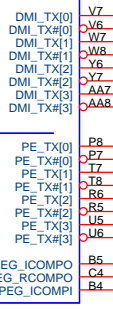
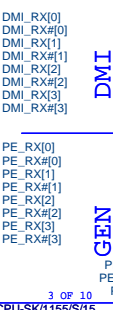
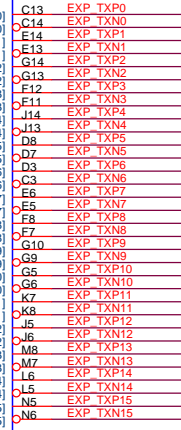
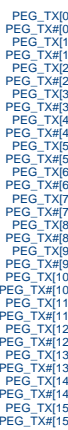
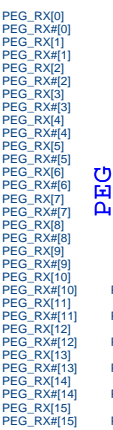
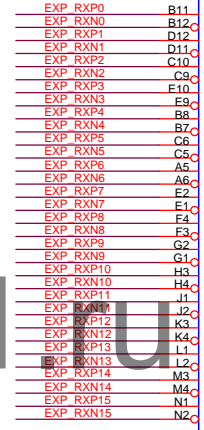
CFG 0-17 all internal PULL-UP



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



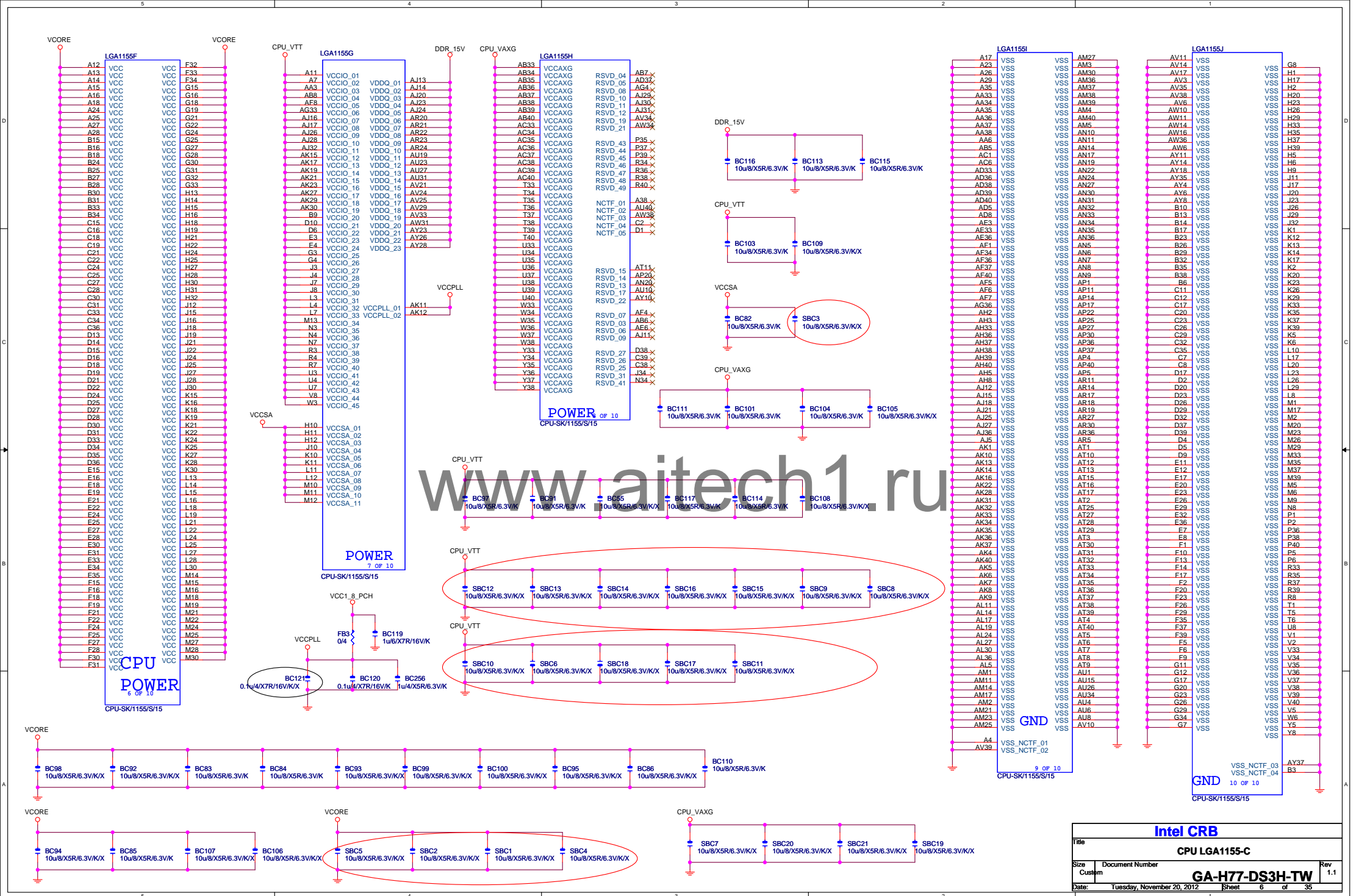
PCIEX16:16/5/5/5/16(breakout min 10/4/4/4/10)
Impedance=80 +/- 17.5%;L<5inch

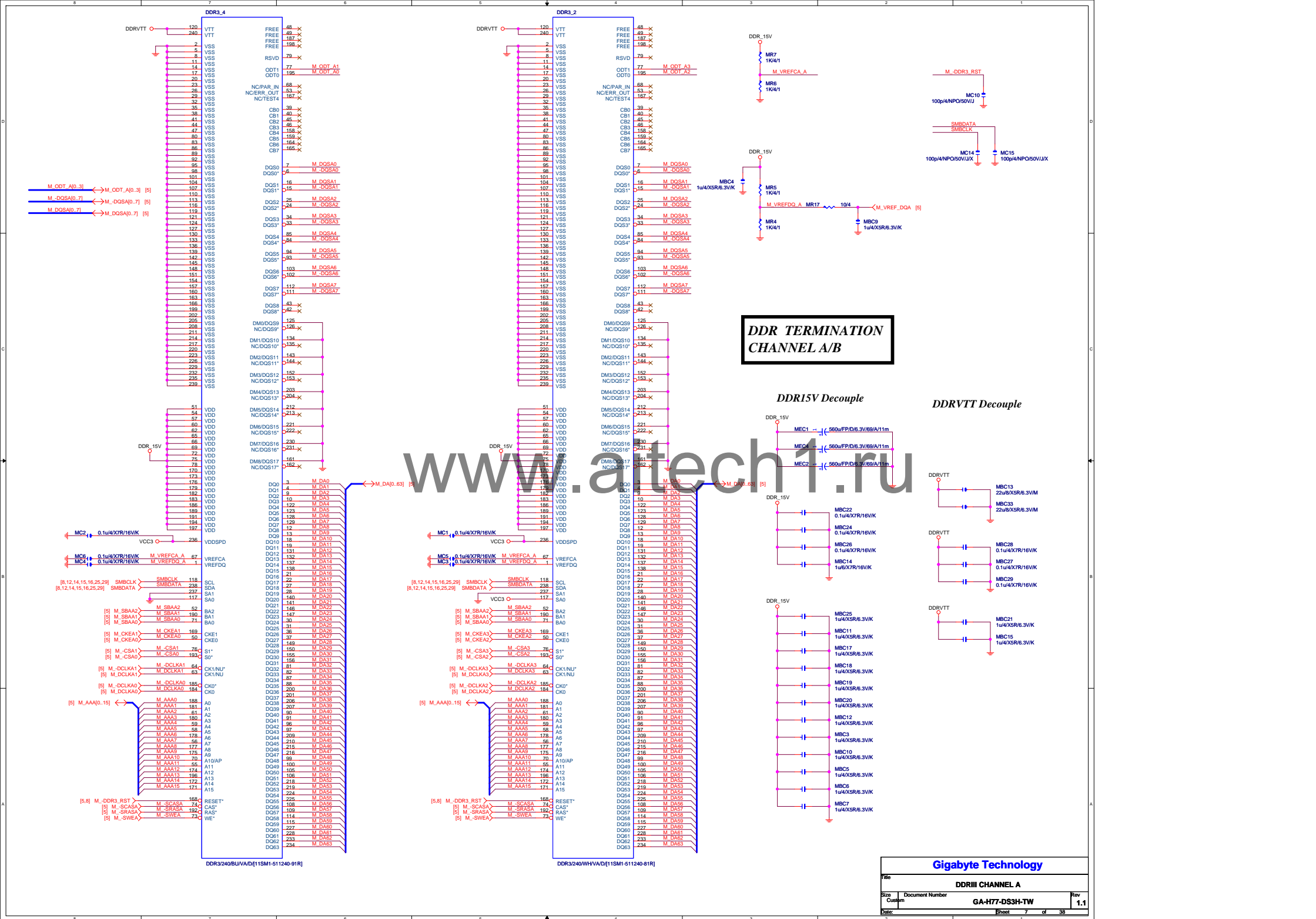


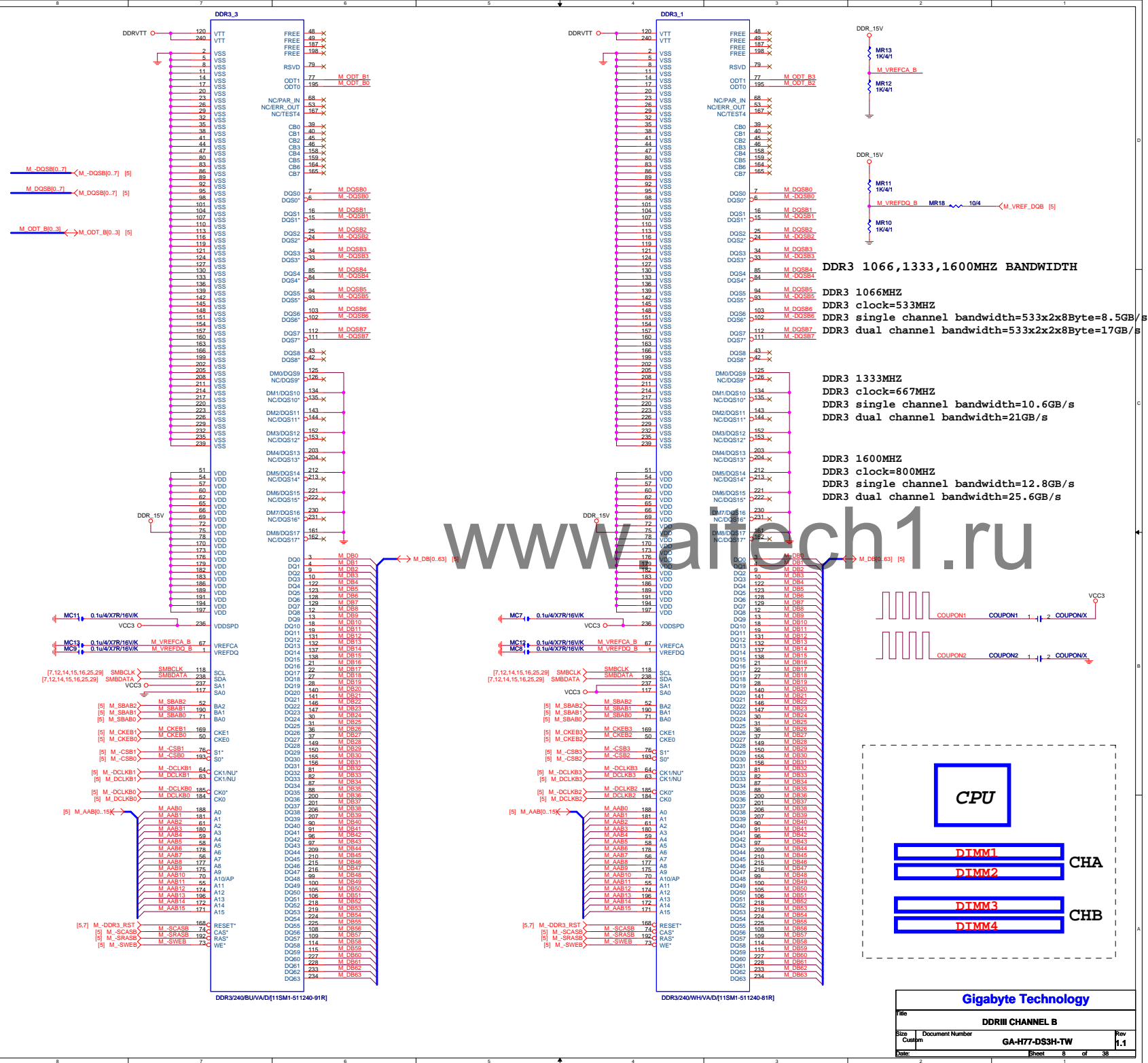
3 OF 10

CPU-SK/1155/S15

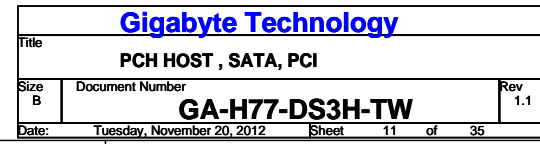
Gigabyte Technology		
CPU LGA1155-A		
Size	Document Number	Rev
Custom	GA-H77-DS3H-TW	1.1
Date:	Tuesday, November 20, 2012	Sheet 4 of 35

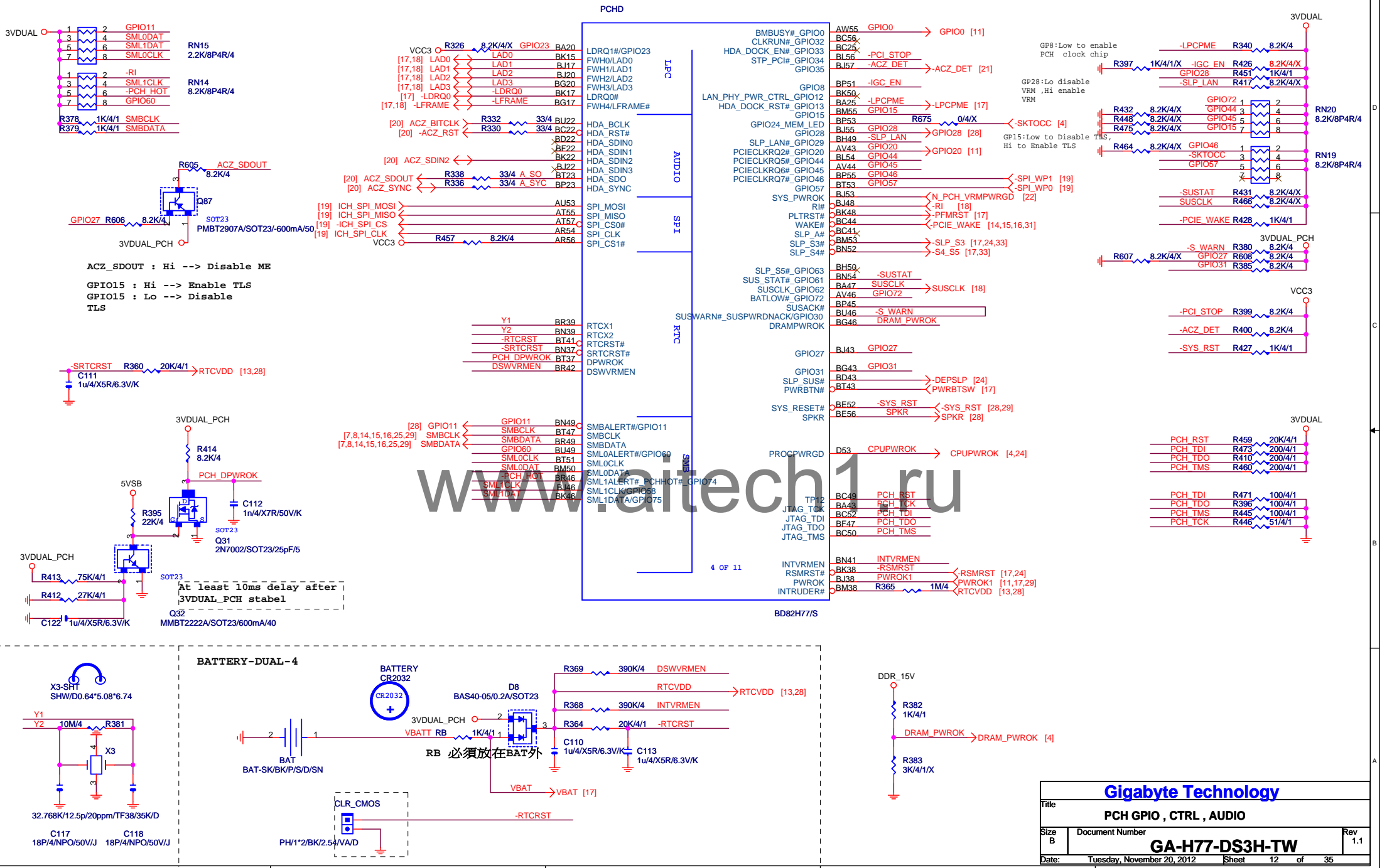






SATA2 : 15/7.5/4.5/7.5/15 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5% BCHC





+12 protect
short-wire
test

PCIEX16:16/5/5/5/16

EXP_RXP[0..15] >>> EXP_RXP[0..15] [4]
EXP_RXN[0..15] >>> EXP_RXN[0..15] [4]
EXP_TXP[0..15] >>> EXP_TXP[0..15] [4]
EXP_TXN[0..15] >>> EXP_TXN[0..15] [4]

EXP_TXP0	C43	0.22u/4X5R6.3V/K	EXP_TXP0C
EXP_TXN0	C36	0.22u/4X5R6.3V/K	EXP_TXN0C
EXP_TXP1	C47	0.22u/4X5R6.3V/K	EXP_TXP1C
EXP_TXN1	C49	0.22u/4X5R6.3V/K	EXP_TXN1C
EXP_TXP2	C52	0.22u/4X5R6.3V/K	EXP_TXP2C
EXP_TXN2	C54	0.22u/4X5R6.3V/K	EXP_TXN2C
EXP_TXP3	C57	0.22u/4X5R6.3V/K	EXP_TXP3C
EXP_TXN3	C59	0.22u/4X5R6.3V/K	EXP_TXN3C
EXP_TXP4	C62	0.22u/4X5R6.3V/K	EXP_TXP4C
EXP_TXN4	C64	0.22u/4X5R6.3V/K	EXP_TXN4C
EXP_TXP5	C65	0.22u/4X5R6.3V/K	EXP_TXP5C
EXP_TXN5	C67	0.22u/4X5R6.3V/K	EXP_TXN5C
EXP_TXP6	C69	0.22u/4X5R6.3V/K	EXP_TXP6C
EXP_TXN6	C71	0.22u/4X5R6.3V/K	EXP_TXN6C
EXP_TXP7	C76	0.22u/4X5R6.3V/K	EXP_TXP7C
EXP_TXN7	C75	0.22u/4X5R6.3V/K	EXP_TXN7C
EXP_TXP8	C79	0.22u/4X5R6.3V/K	EXP_TXP8C
EXP_TXN8	C80	0.22u/4X5R6.3V/K	EXP_TXN8C
EXP_TXP9	C81	0.22u/4X5R6.3V/K	EXP_TXP9C
EXP_TXN9	C82	0.22u/4X5R6.3V/K	EXP_TXN9C
EXP_TXP10	C86	0.22u/4X5R6.3V/K	EXP_TXP10C
EXP_TXN10	C87	0.22u/4X5R6.3V/K	EXP_TXN10C
EXP_TXP11	C90	0.22u/4X5R6.3V/K	EXP_TXP11C
EXP_TXN11	C91	0.22u/4X5R6.3V/K	EXP_TXN11C
EXP_TXP12	C92	0.22u/4X5R6.3V/K	EXP_TXP12C
EXP_TXN12	C93	0.22u/4X5R6.3V/K	EXP_TXN12C
EXP_TXP13	C95	0.22u/4X5R6.3V/K	EXP_TXP13C
EXP_TXN13	C96	0.22u/4X5R6.3V/K	EXP_TXN13C
EXP_TXP14	C97	0.22u/4X5R6.3V/K	EXP_TXP14C
EXP_TXN14	C98	0.22u/4X5R6.3V/K	EXP_TXN14C
EXP_TXP15	C99	0.22u/4X5R6.3V/K	EXP_TXP15C
EXP_TXN15	C100	0.22u/4X5R6.3V/K	EXP_TXN15C

PCI-E REV:1.1--> 2.5GHZ

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

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

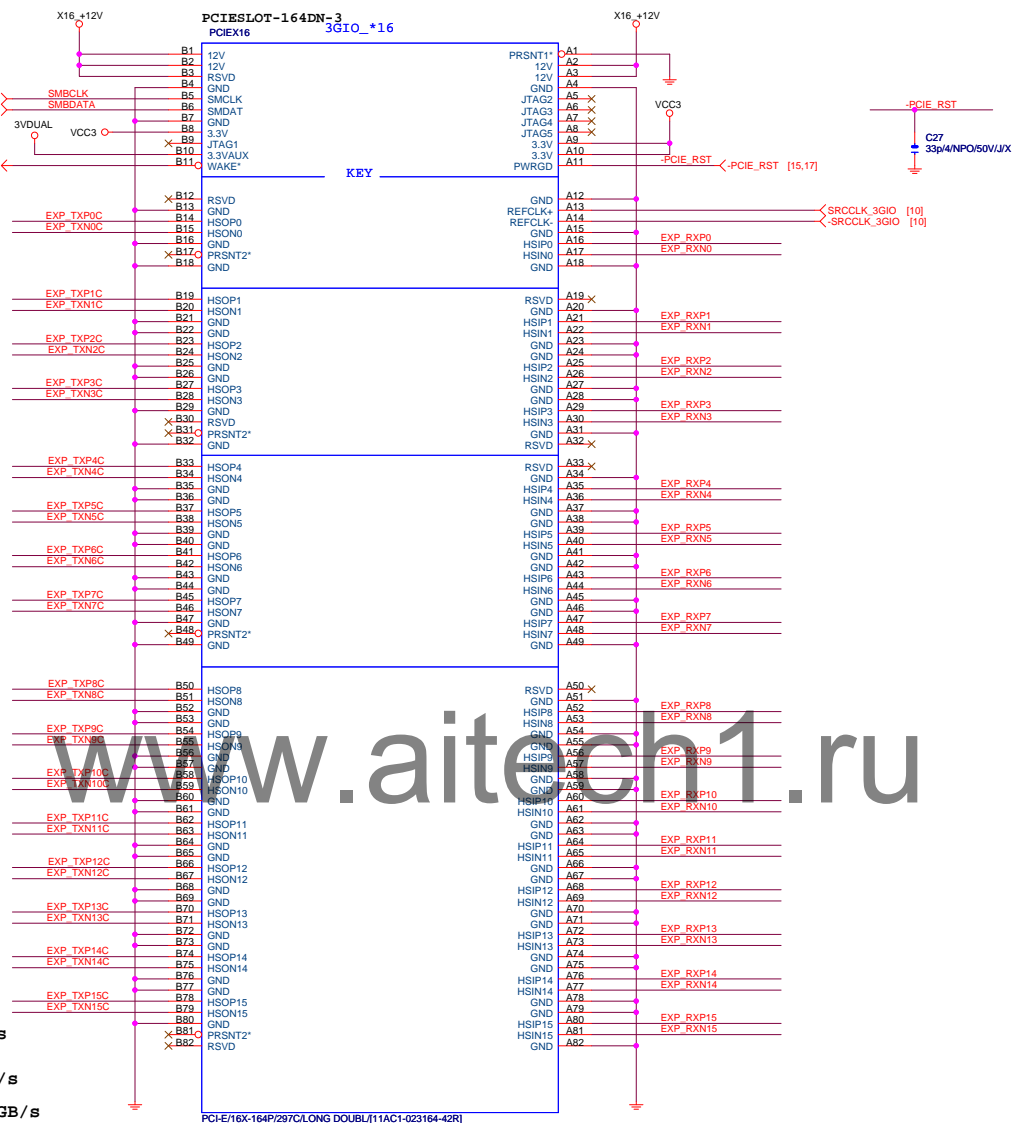
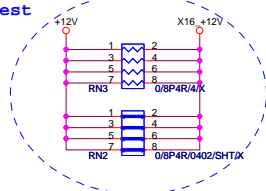
PCE-E X16(單向) BANDWIDTH=2.5GHz*(8b/10b)X16=32Gb/s=4GB/s

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

PCI-E REV:2.0--> 5GHZ

[7,8,12,15,16,25,29] SMBCLK
[7,8,12,15,16,25,29] SMBDATA

[12,15,16,31] -PCIE_WAKE



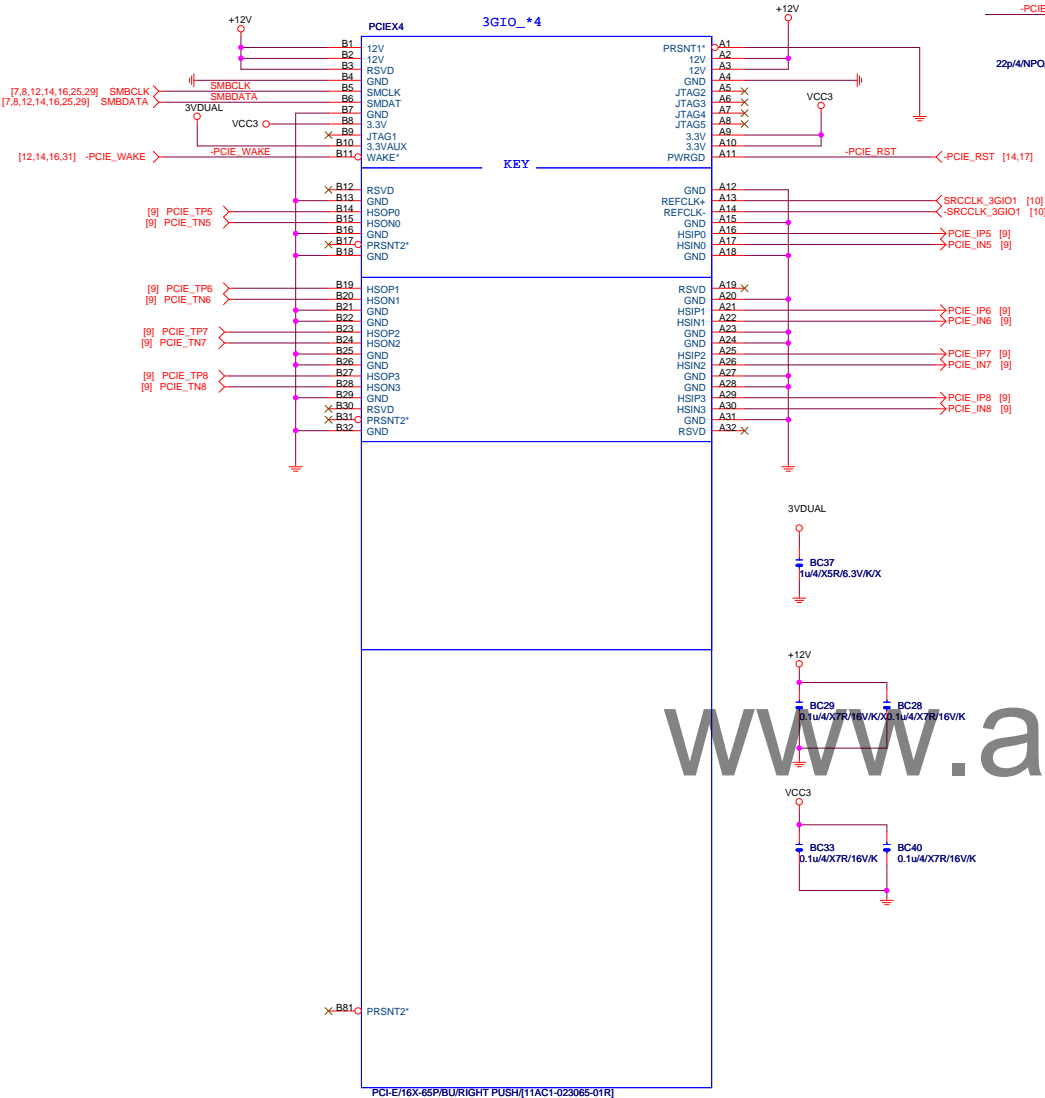
Gigabyte Technology

PCI EXPRESS * 16

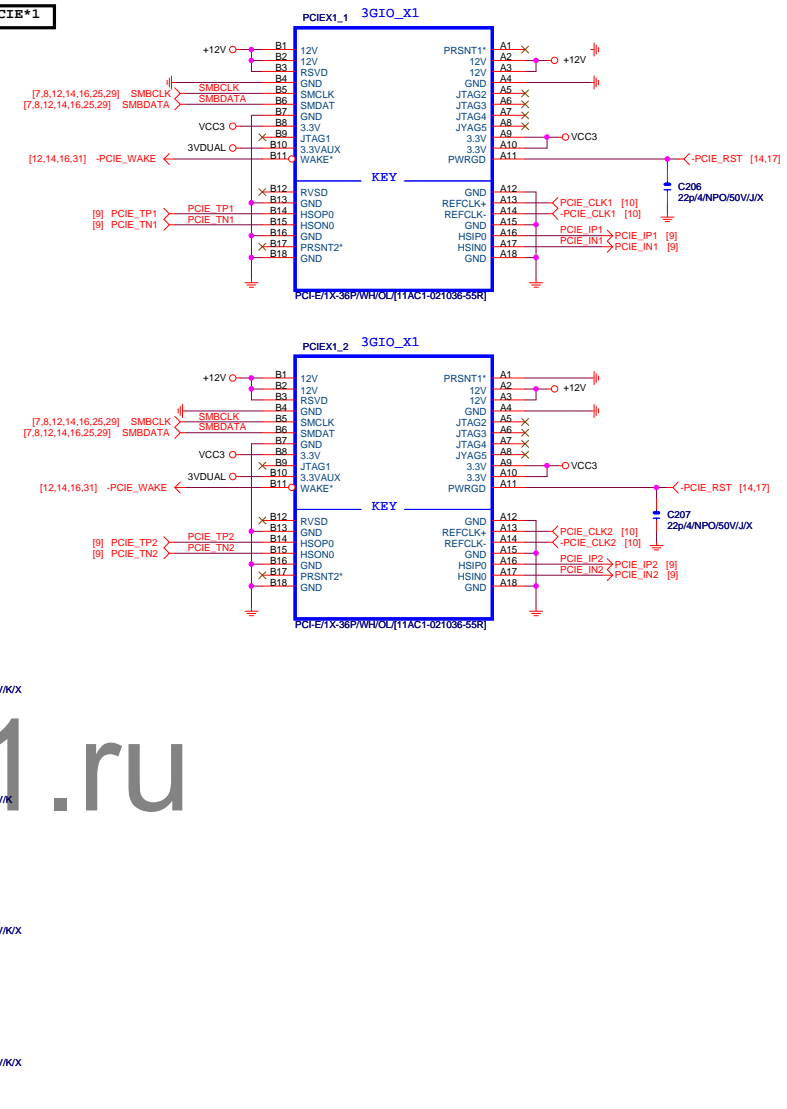
Size Custom Document Number GA-H77-DS3H-TW Rev 1.1

Date: Tuesday, November 20, 2012 Sheet 14 of 35

PCIE*4

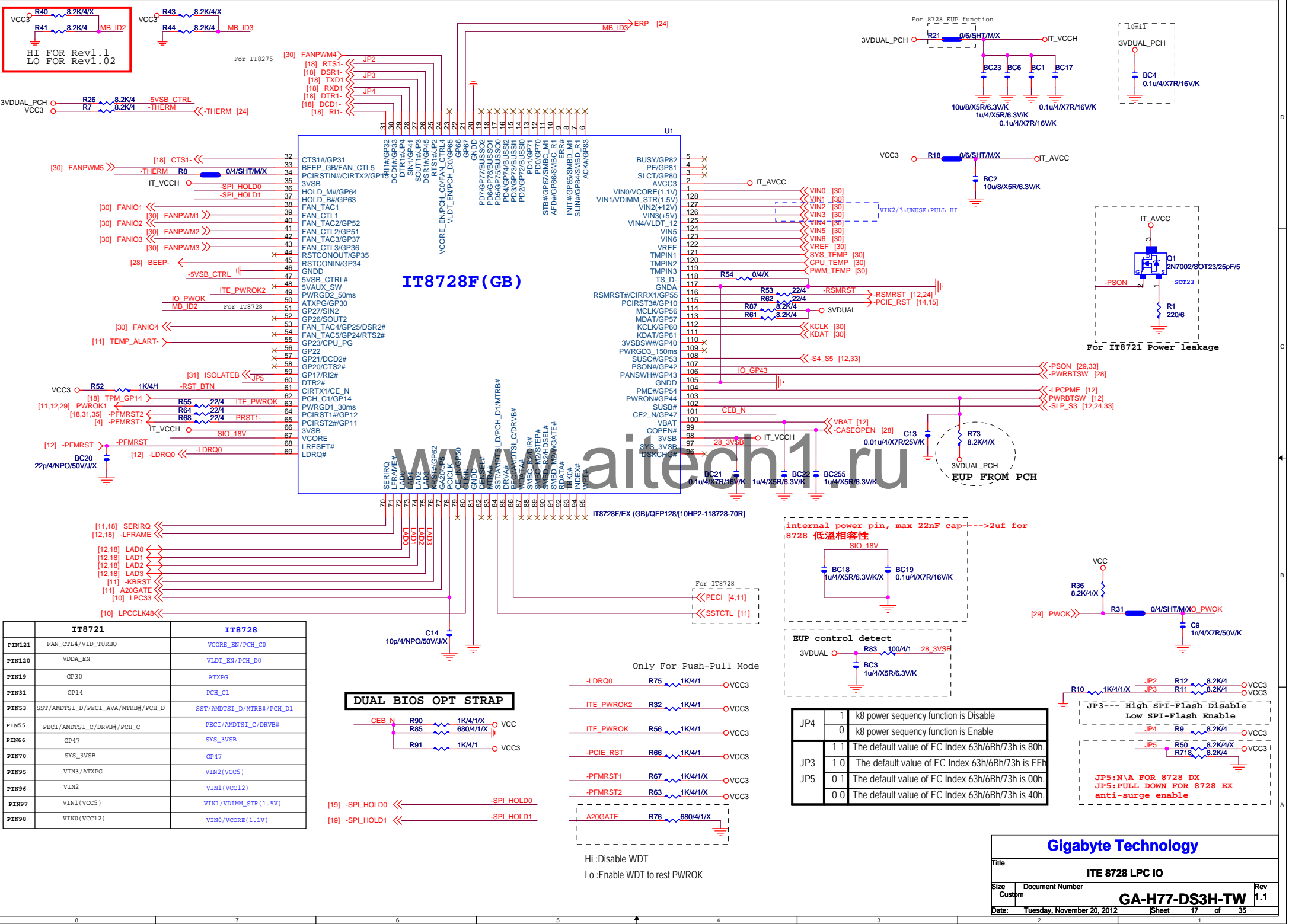


PCIE*1



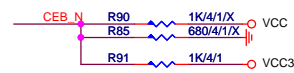
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Gigabyte Technology			
Title			
PCI EXPRESS X 4 PORT			
Size	Document Number	Rev	
Custom	GA-H77-DS3H-TW	1.1	
Date:	Tuesday, November 20, 2012	Sheet	15 of 35

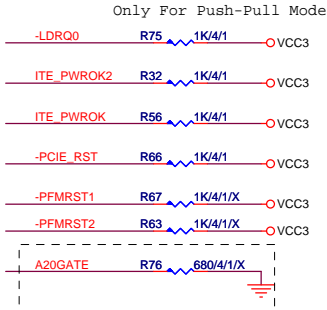


	IT8721	IT8728
PIN121	FAN_CTL4/VID_TURBO	VCORE_EN/PCH_C0
PIN120	VDDA_EN	VLDI_EN/PCH_D0
PIN19	GP30	ATXPG
PIN31	GP14	PCH_C1
PIN53	SST/AMDTSI_D/PBCL_AVA/MTRB#/PCH_D	SST/AMDTSI_D/MTRB#/PCH_D1
PIN55	PECI/AMDTSI_C/DRV#/PCH_C	PECI/AMDTSI_C/DRV#
PIN66	GP47	SYS_3VSB
PIN70	SYS_3VSB	GP47
PIN95	VIN3/ATXPG	VIN2(VCC5)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

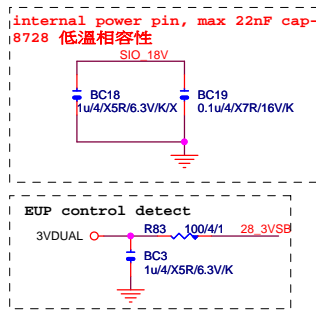
DUAL BIOS OPT STRAP



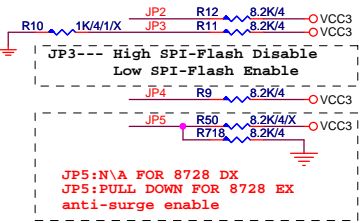
[19] -SPL_HOLD0 << -SPL_HOLD0
[19] -SPL_HOLD1 << -SPL_HOLD1



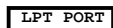
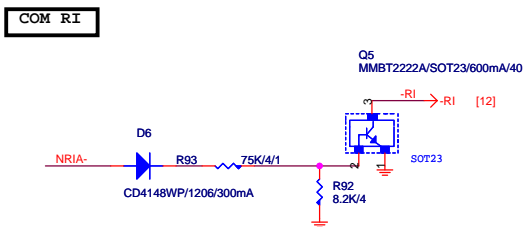
Hi :Disable WDT
Lo :Enable WDT to rest PWROK

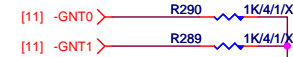
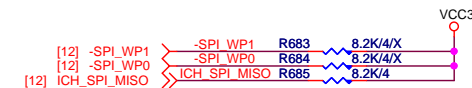
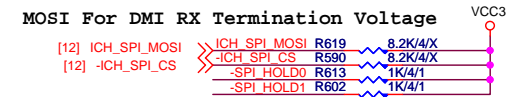
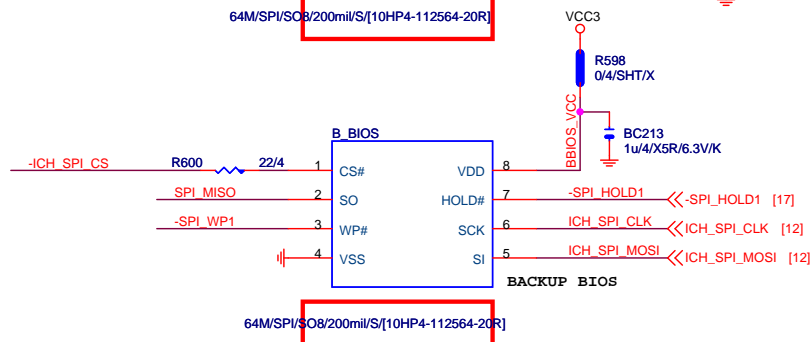
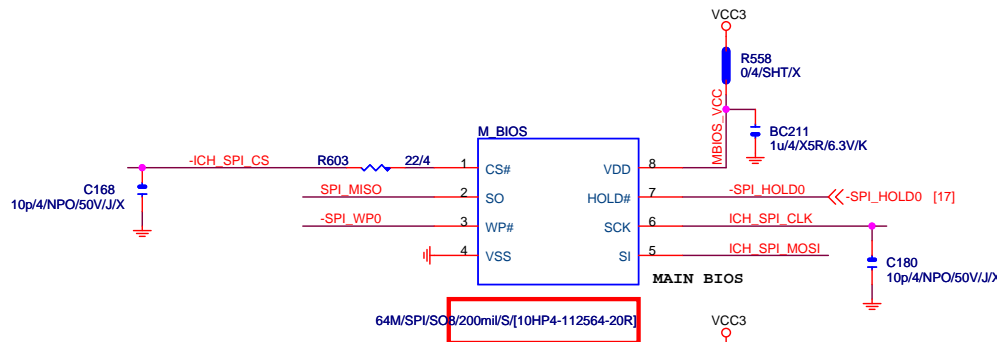
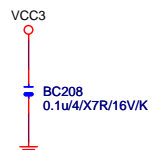


JP4	1	k8 power sequency function is Disable
	0	k8 power sequency function is Enable
JP3	1 1	The default value of EC Index 63h/6Bh/73h is 80h.
	1 0	The default value of EC Index 63h/6Bh/73h is FFh
JP5	0 1	The default value of EC Index 63h/6Bh/73h is 00h.
	0 0	The default value of EC Index 63h/6Bh/73h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

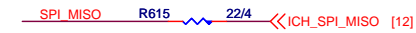


JP5:N/A FOR 8728 DX
JP5:PULL DOWN FOR 8728 EX
anti-surge enable





Default int pull up

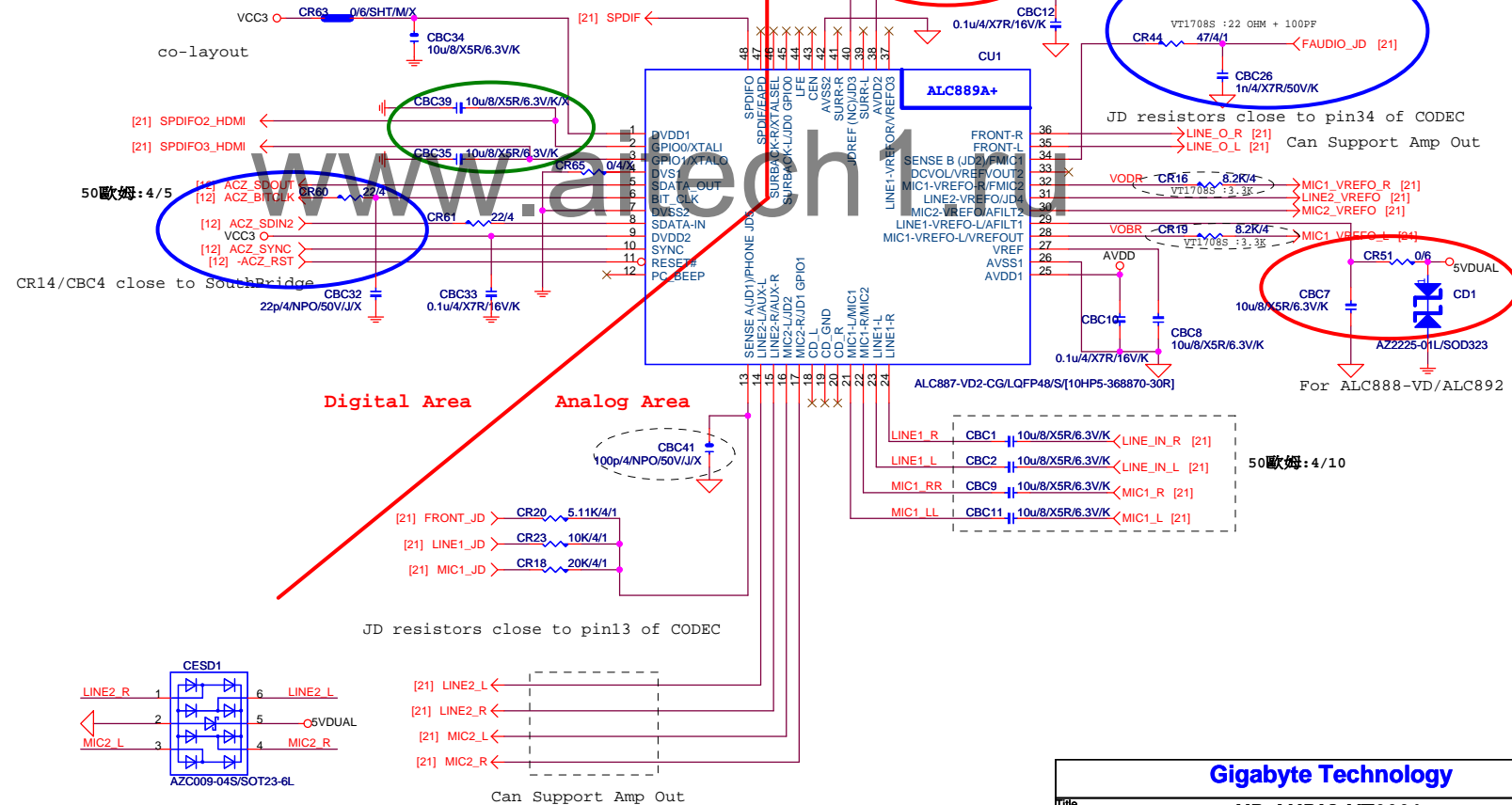


BOOT DEVICE	GNT0	GNT1
LPC	0	0
PCI	0	1
NAND	1	0
SPI	1	1

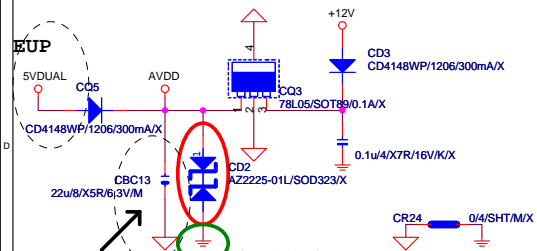
1 means floating
0 means PD 1K

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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



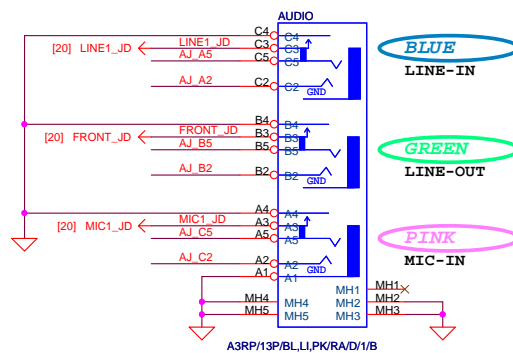
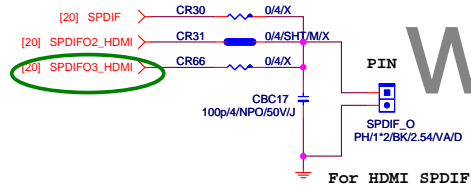
CODEC POWER/EMI PAD



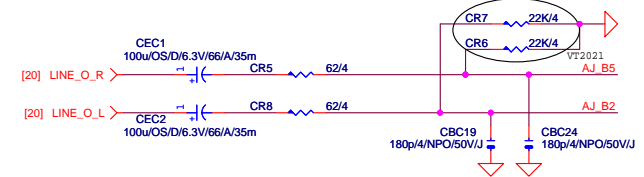
上ALC892時,此顆電容要保留

ADD CD2 For ESD PROTECT DIODE

SPDIF_OUT

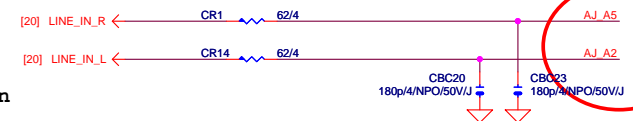


LINE-OUT

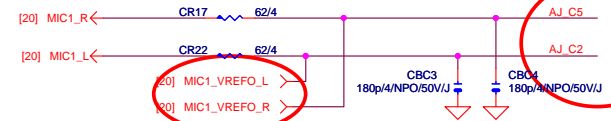


Only reserved for ALC888

LINE-IN

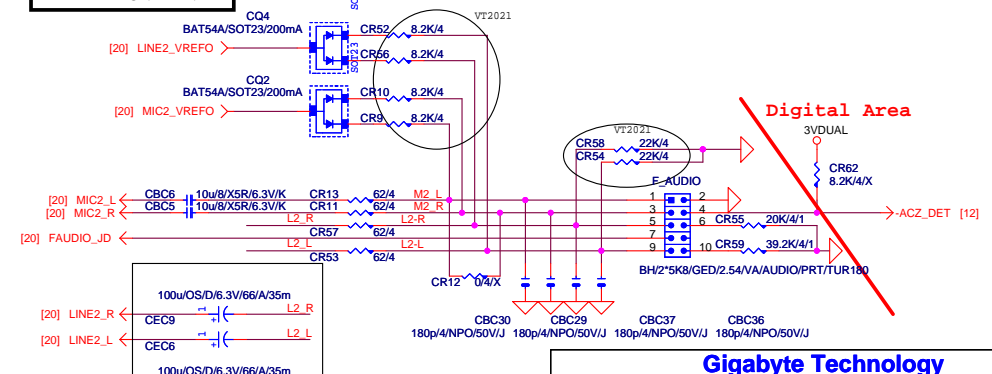
Verify MIC function
in LINE-in

MIC-IN



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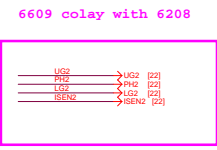
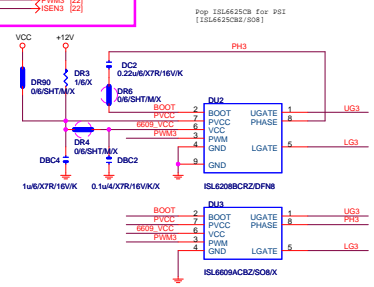
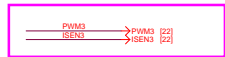
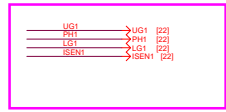
AZALIA FRONT PANEL



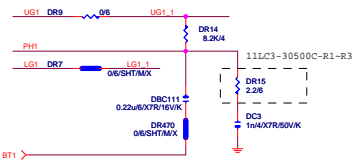
Digital Area

Gigabyte Technology

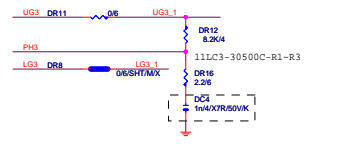
Title			AUDIO JACK	
Size			GA-H77-DS3H-TW	
Date:			Tuesday, November 20, 2012	Sheet 21 of 35



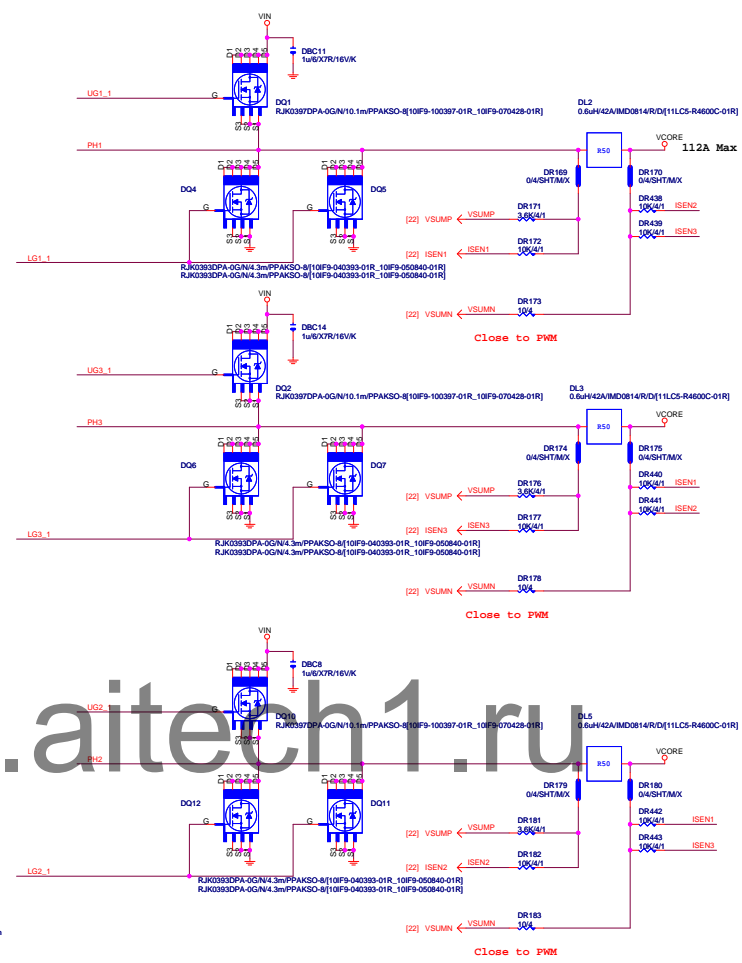
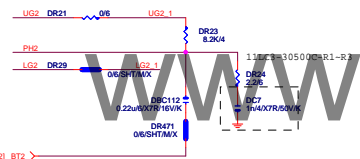
[1] [22] BT1



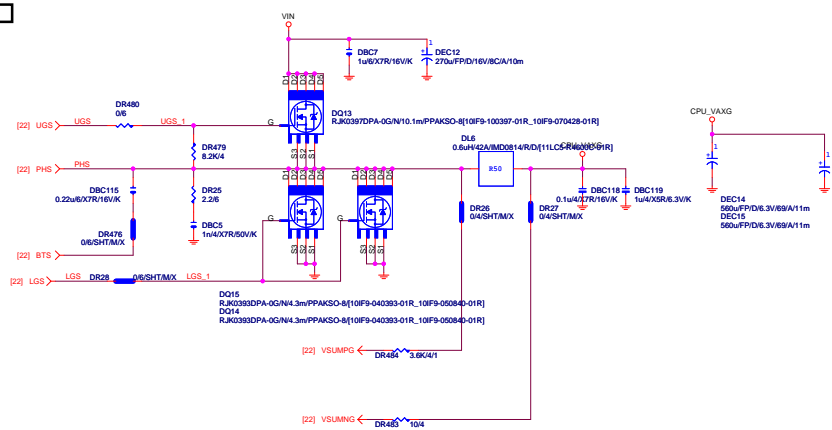
[3]



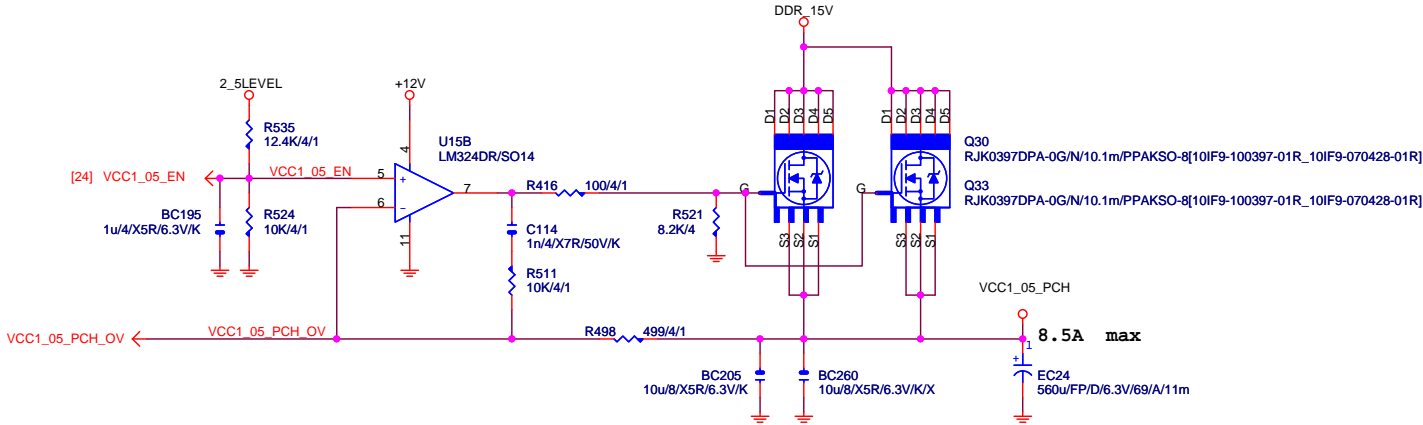
[2] [22] BT2



VXAG

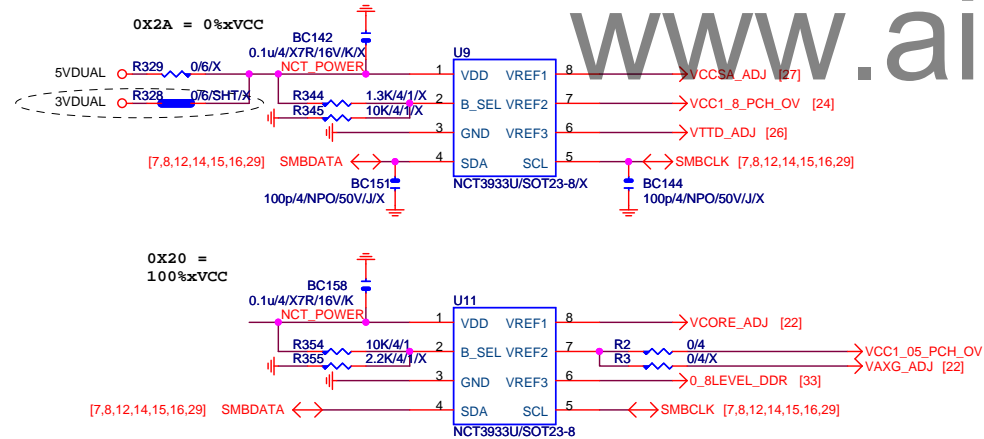


VCC1_05_PCH



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

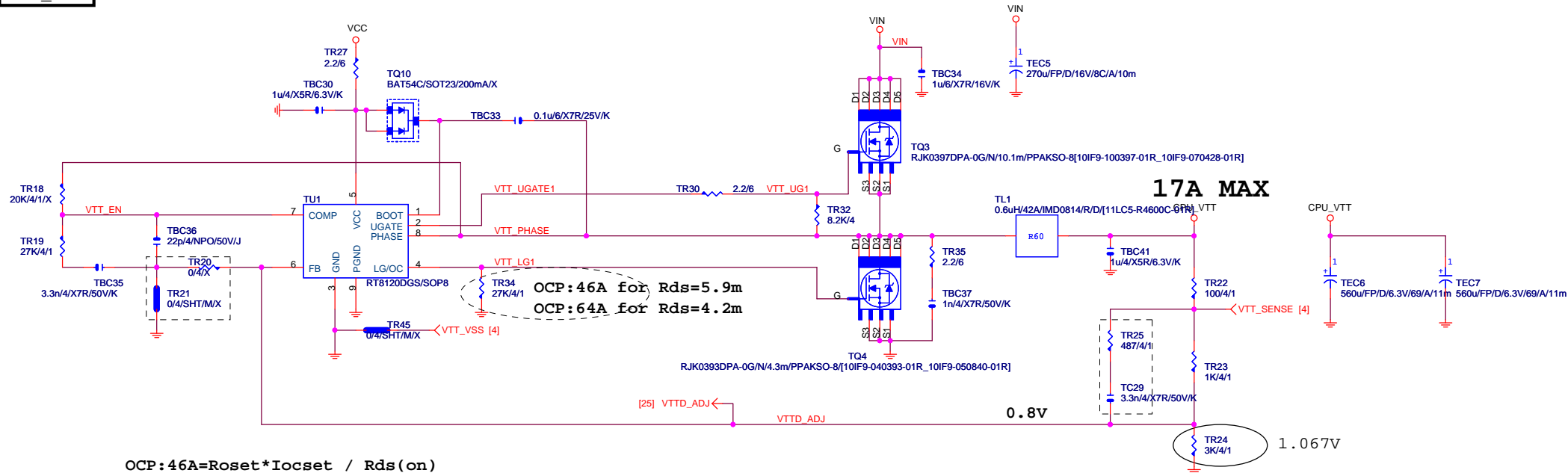


up6262	0X2A	0X20
VREF1	VCC1_05_PCH	VCORE
VREF2	VCC1_8_PCH	VCCSA
VREF3	CPU_VTT	DDR

	ITE8728	ITE8728
H77-DS3H	MB_ID2 (GP27)	MB_ID3 (GP67)
1.0 3931	1	0
1.01 3931	1	1
1.02 3931	0	1
1.1 3931	1	1
1.1 3933	0	0

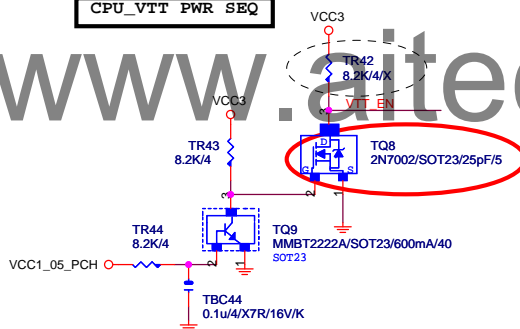
Gigabyte Technology		
Title	PCH CORE / VOLTAGE CONSOLE	
Size B	Document Number	Rev
	GA-H77-DS3H-TW	1.1
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CPU_VTT



$$OCP: 46A = \frac{R_{oset} * I_{ocset}}{R_{ds(on)}} = \frac{27K * 10\mu A}{5.9m}$$

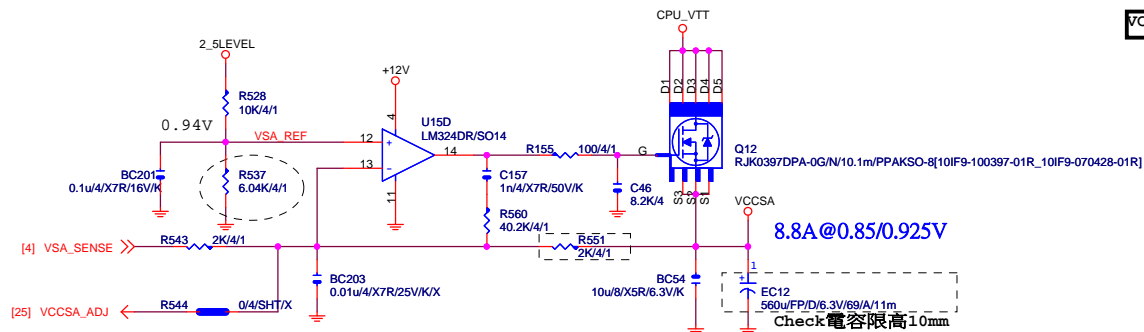
CPU_VTT PWR SEQ



GIGABYTE

Title		
RT8120_CPU_VTT		
Size	Document Number	Rev
Custom	GA-H77-DS3H-TW	1.1
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VCC_SA

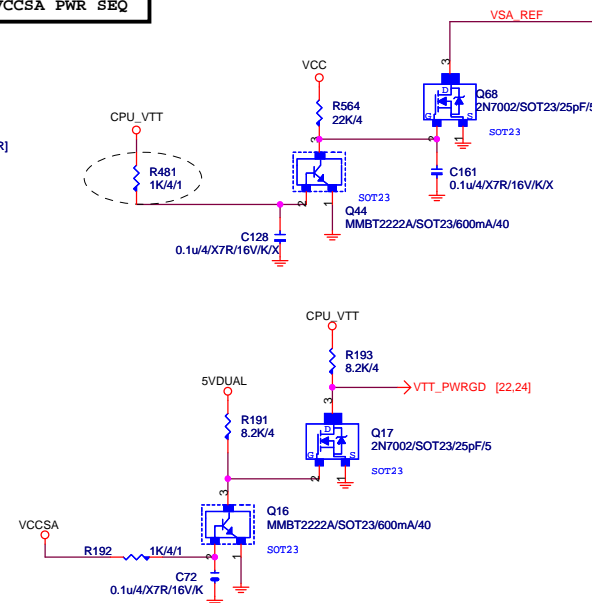


PDG 1.01

	VSA_SEL
HI	0.85V
LO	0.925V

According intel
CDI/IBP#476733, 固定0.925V

VCCSA_PWR_SEQ

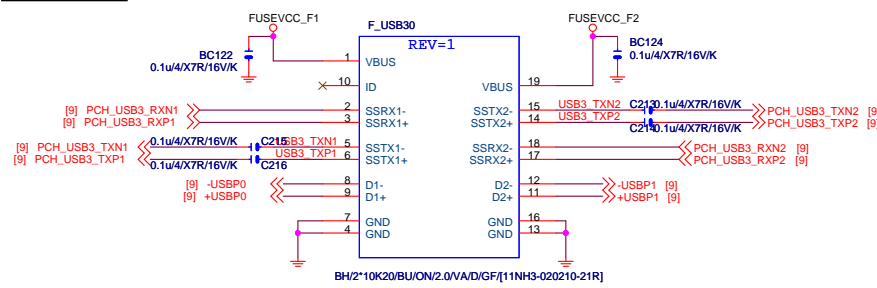


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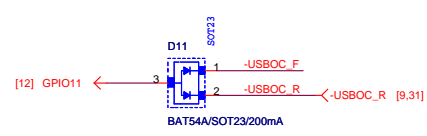
Gigabyte Technology

Title			
VCCSA POWER			
Size	Document Number	Rev	
Custom		GA-H77-DS3H-TW	
Date:	Tuesday, November 20, 2012	Sheet	27 of 35

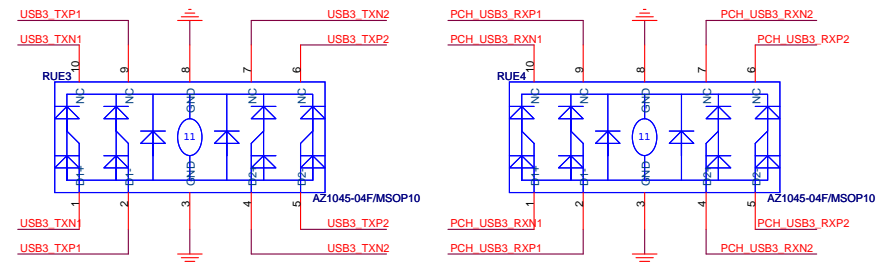
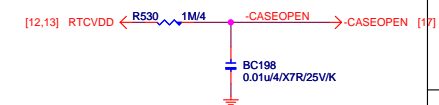
FRONT USB1



F_USB POWER PROTECT

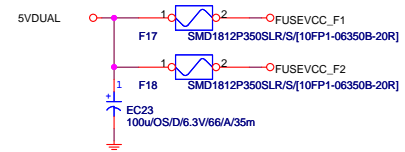
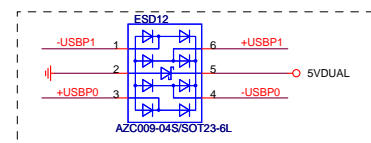


CASE OPEN

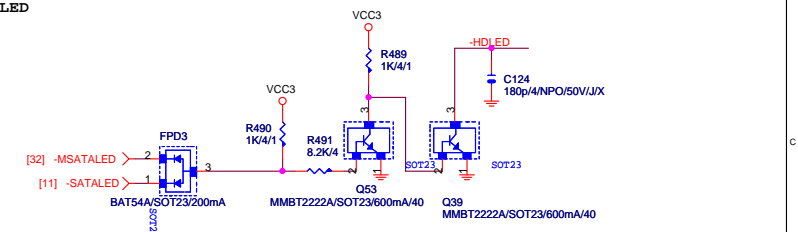


ESD Close to connector

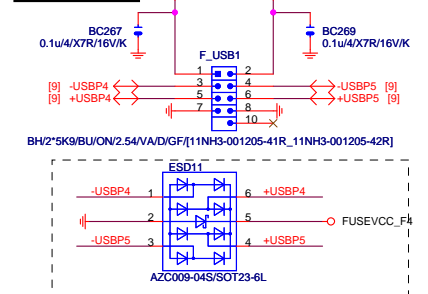
ESD Close to connector



SATA LED

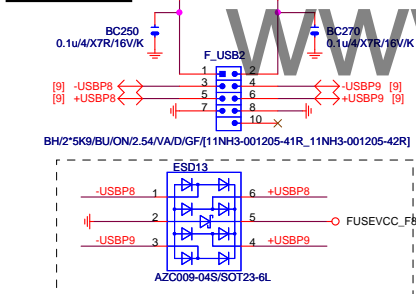


FRONT USB1

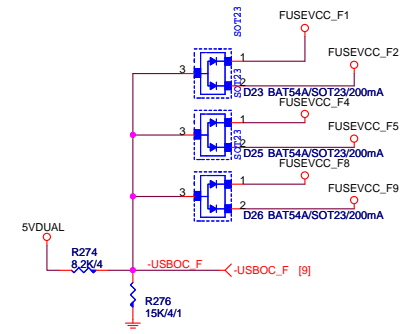
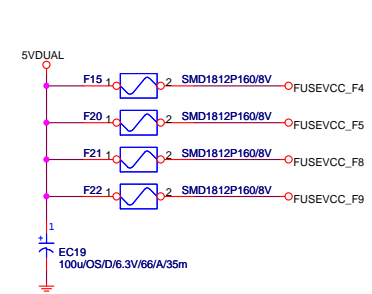


ESD Close to connector

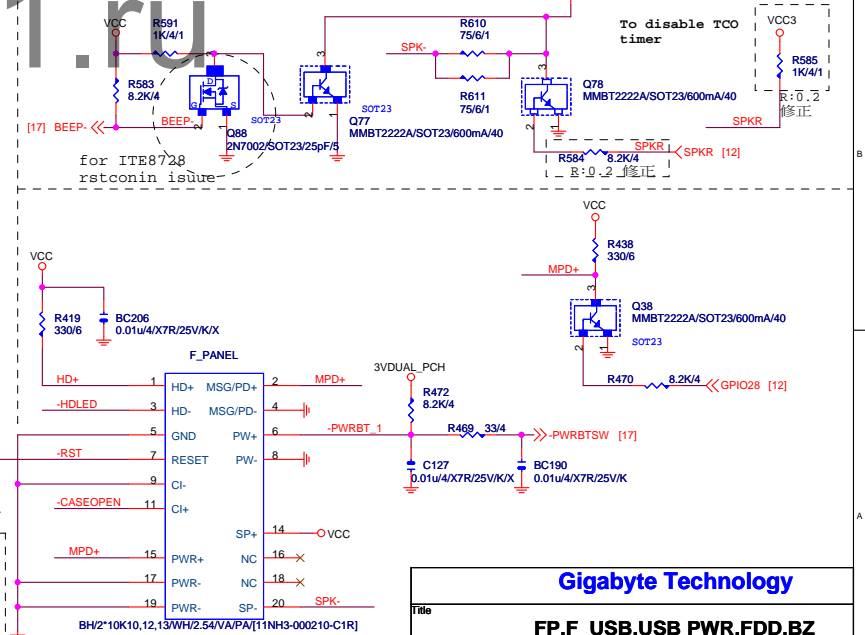
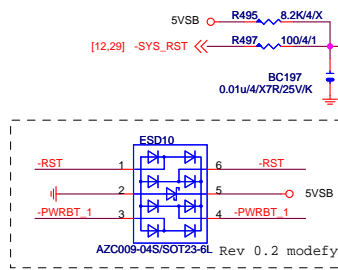
FRONT USB2



ESD Close to connector

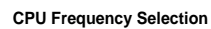


INTEL FRONT PANEL



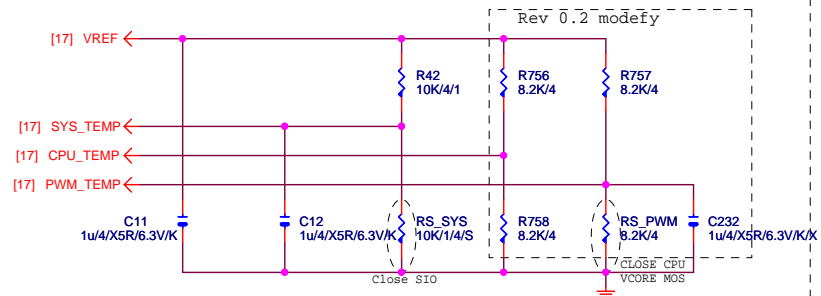
Gigabyte Technology			
Title	FP,F_USB,USB PWR,FDD,BZ		
Size	Document Number	GA-H77-DS3H-TW	
Custom		Rev 1.1	
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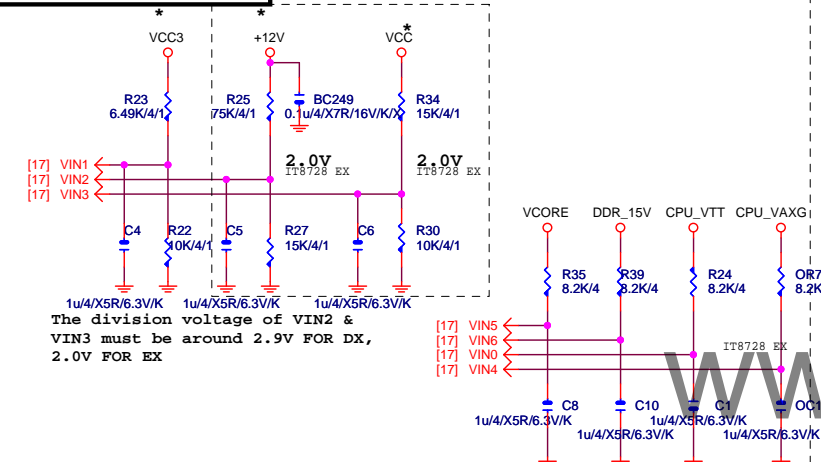


FS	CPU
0	100M <Default>
1	133M

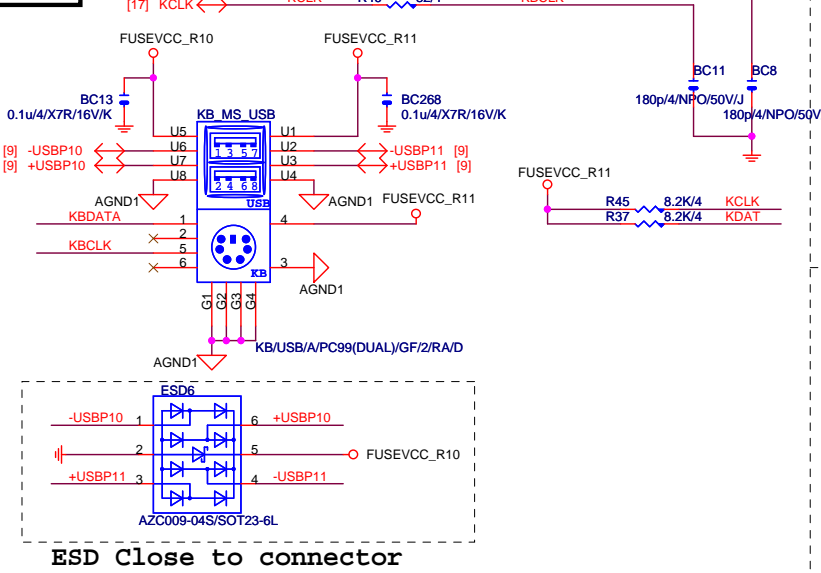
TEMP H/W MONITOR



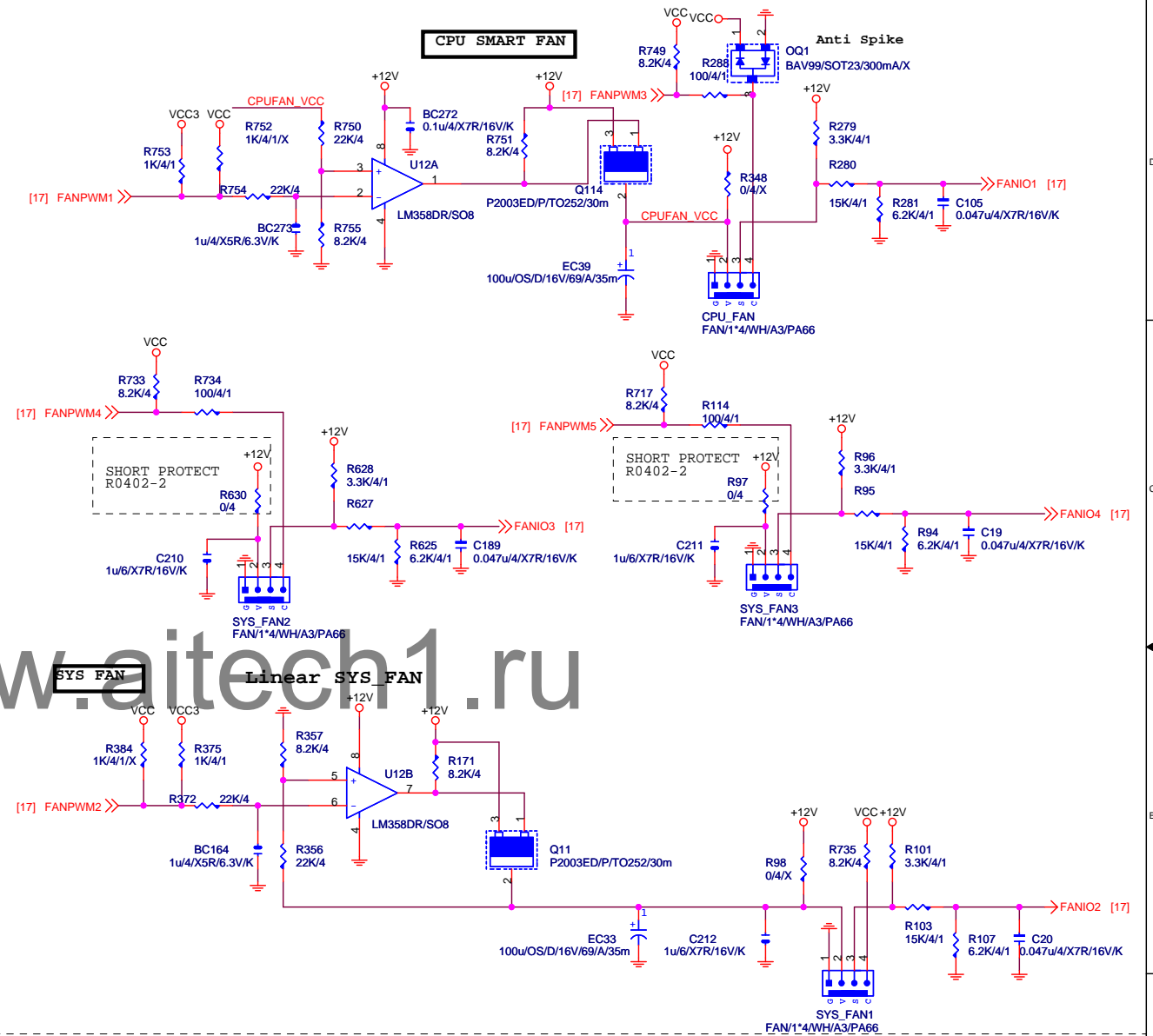
VOLTAGE-- H/W MONITOR



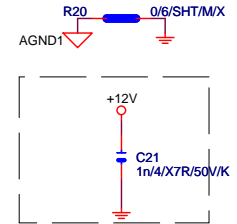
KB/USB



CPU SMART FAN



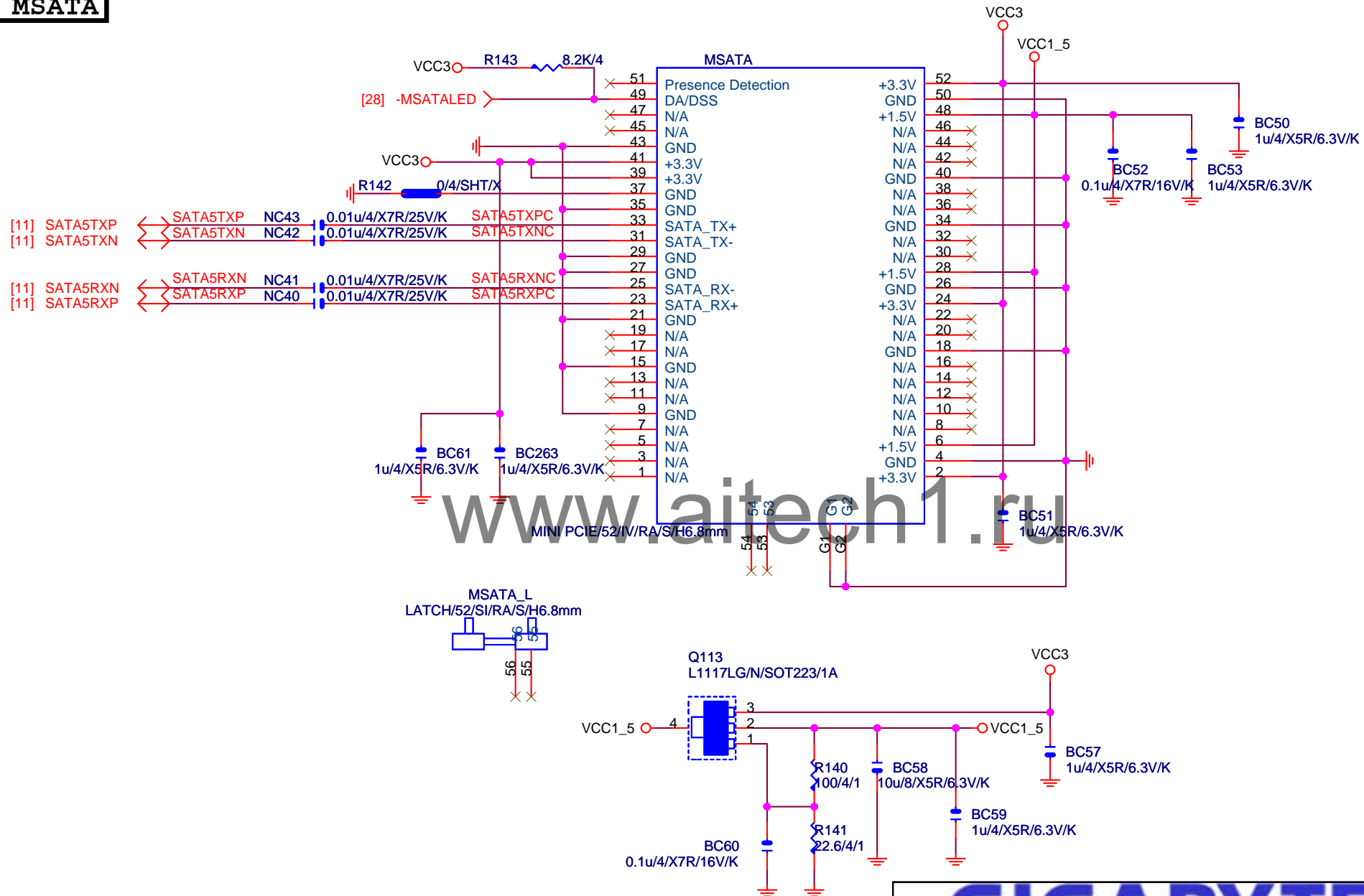
FOR EMI ONLY



Gigabyte Technology

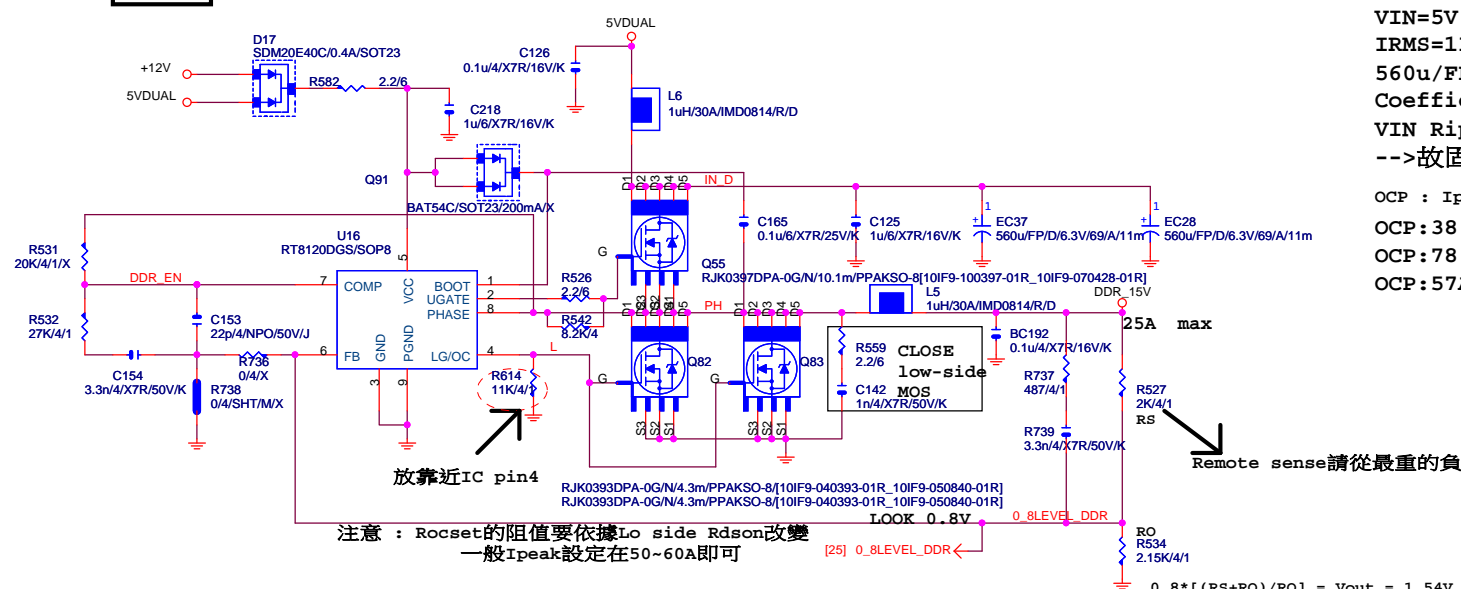
Title				HWM,KB/MS, FAN CTRL			
Size		Document Number				Rev	
Custom		GA-H77-DS3H-TW				1.1	
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MSATA



GIGABYTE™

Title		
MSATA		
Size A	Document Number	Rev
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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 : $I_{peak} = (2 \times I_{ocset} \times R_{ocset}) / R_{dson}$
 OCP: 38.31A for $R_{ds} = 6.7m$ for vishay@4.5V
 OCP: 78.78A for $R_{ds} = 3.3m$ for renesas@10V
 OCP: 57A = $R_{ocset} \times I_{ocset} / R_{ds(on)}$
 = $11K \times 10uA / [5//5]$

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

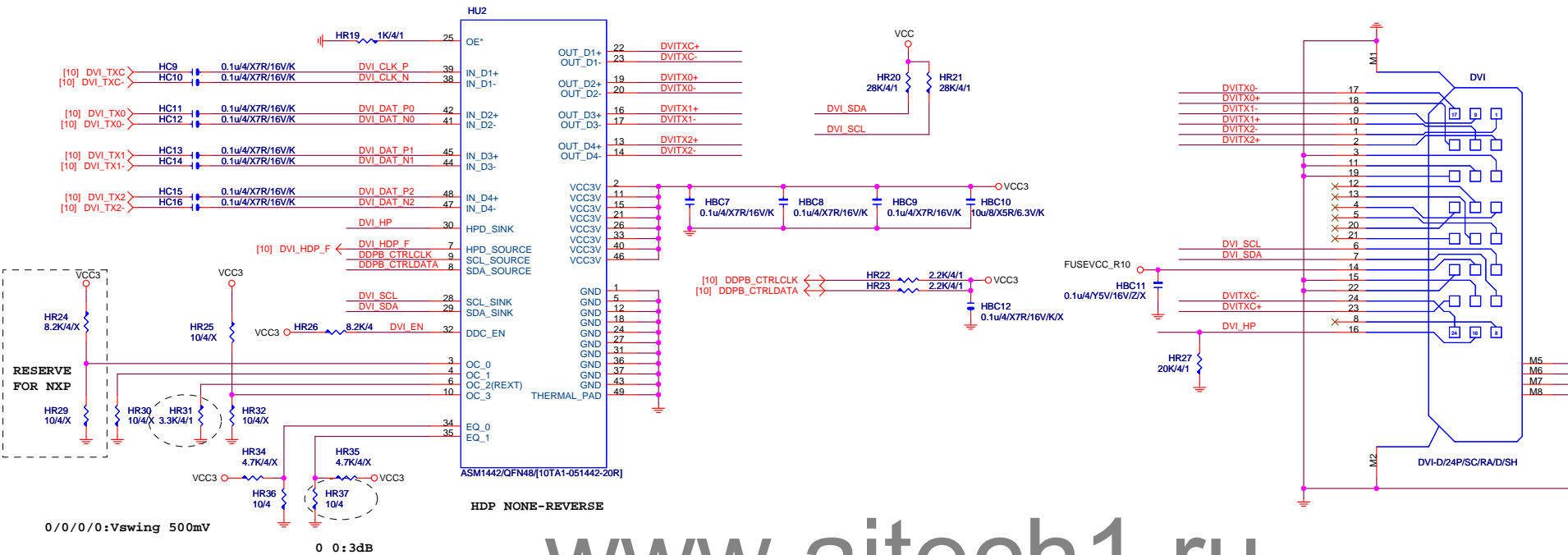
Remote sense請從最重的負載端點拉回



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GIGABYTE™			
Title			
RT8120			
Size	Document Number	Rev	
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DVI LEVEL SHIFT

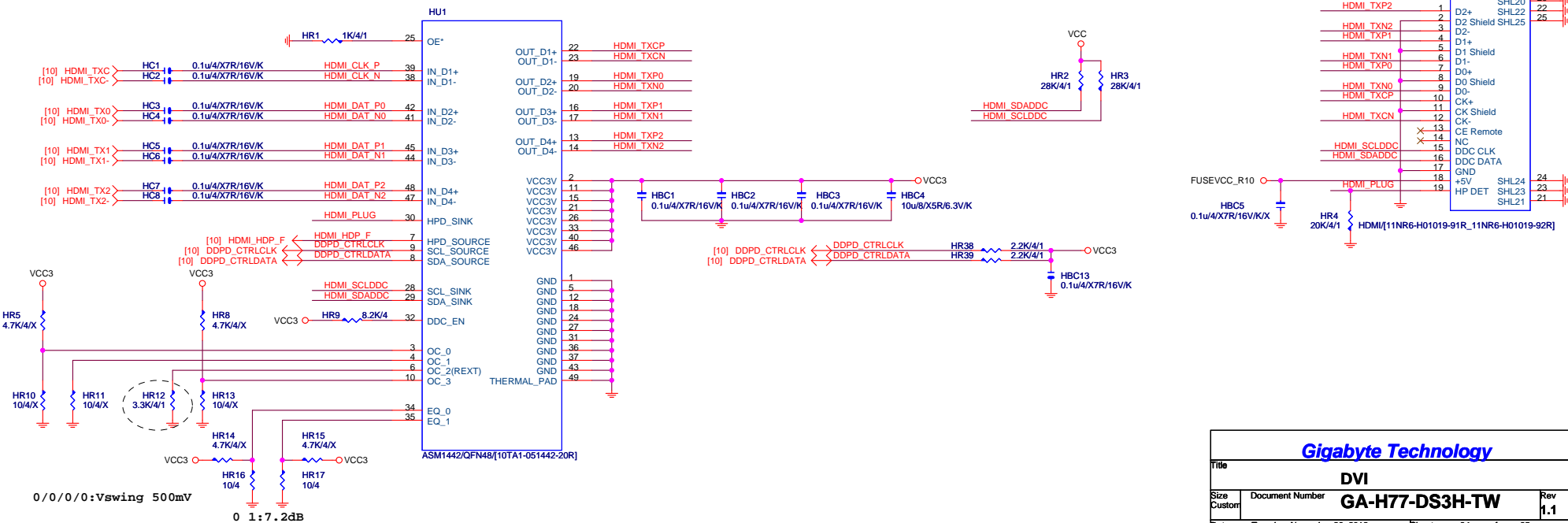


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HDMI LEVEL SHIFT

HDMI:20/4/6/4/20

Impedance=85 +- 17.5%



Gigabyte Technology

DVI

GA-H77-DS3H-TW

Rev 1.1

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