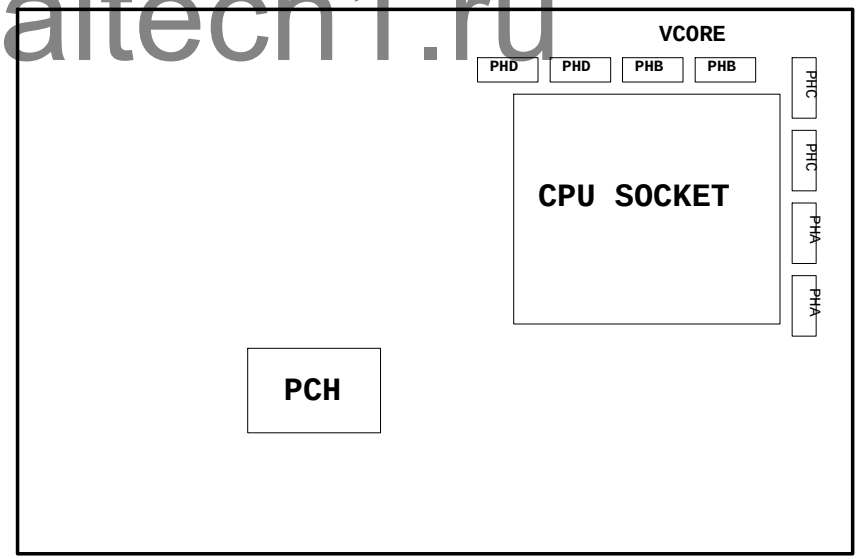
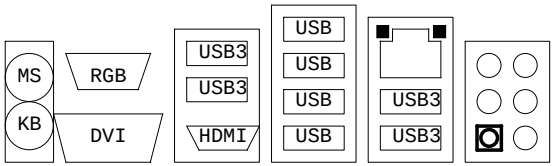
Model Name: GA-Z97X-UD3H

SHEET	TITLE
01	COVER SHEET
02	BOM & PCB MODIFY HISTORY
03	BLOCK DIAGRAM
04	CPU_LGA1150-A
05	CPU_LGA1150-B
06	CPU_LGA1150-C
07	DDR III CHANNEL A
08	DDR III CHANNEL B
09	PCH_FDI,DMI,USB,PCIE
10	PCH_RGB,CLK BUFFER
11	PCH_HOST,SATA,PCI
12	PCH_GPIO,CTRL,AUDIO
13	PCH_PWR,GND
14	PCI EXPRESS*16 SLOT
15	PCI EXPRESS*8 SLOT
16	PCI EXPRESS*16 SWITCH
17	PCI EXPRESS*4 SLOT
18	PCI EXPRESS*1 1,2,3 SLOT
19	ITE8892E
20	PCI SLOT
21	ALC1150 CODEC
22	REAR AUDIO JACK
23	ITE8620
24	COM/KB_MS/R_USB/PROHOT/USB PROTECT
25	ISL95820
26	ISL95820 VCORE Phase 8
27	DDR POWER

SHEET	TITLE
28	DISCRETE POWER
29	DUAL BIOS
30	FP,F_USB,USB PWR,BZ
31	ATX POWER CONNECTOR
32	H/W MONITOR,FAN CTRL
33	DVI
34	HDMI_USB30
35	INTEL LAN I2I7
36	M.2_SATA_EXPRESS
37	TABLE LIST
39	
40	





Gigabyte Technology

Title: Cover Sheet

Size: Custom | Document Number: Z97X-UD3H | Rev: 1.0

Date: Tuesday, April 08, 2014 | Sheet 1 of 37

GA-Z97X-UD3H

Component value change history

Data	Change Item	Reason
2014/2/26 10A	PCB ：興英 精誠 ,(全成信沒承認) 1.LBC2 100P/4 / GBC28 22P/4 REMOVE FOR Glitch 2. VCORE / Non-Vcore 指定用 VISHAY 3. VGA指定用 : VGA/BK/SC/RA/D/2/HR/[11NR6-103015-12R]	
2014/3/14 10B	1. AUDIO change to "11NR6-403025-A1R" 2. R_USB change to "11NR6-304016-09R/11NR6-304016-12R"	
2014/3/21 Z97X-UD3H-BK 10A	1. PCH_HS : 12SP2-S05574-11R 2. MOS_HS1 : 12SP2-S07924-41R ; MOS_HS2 : 12SP2-S07924-51R	

Circuit or PCB layout change

DATE	Change Item	Reason

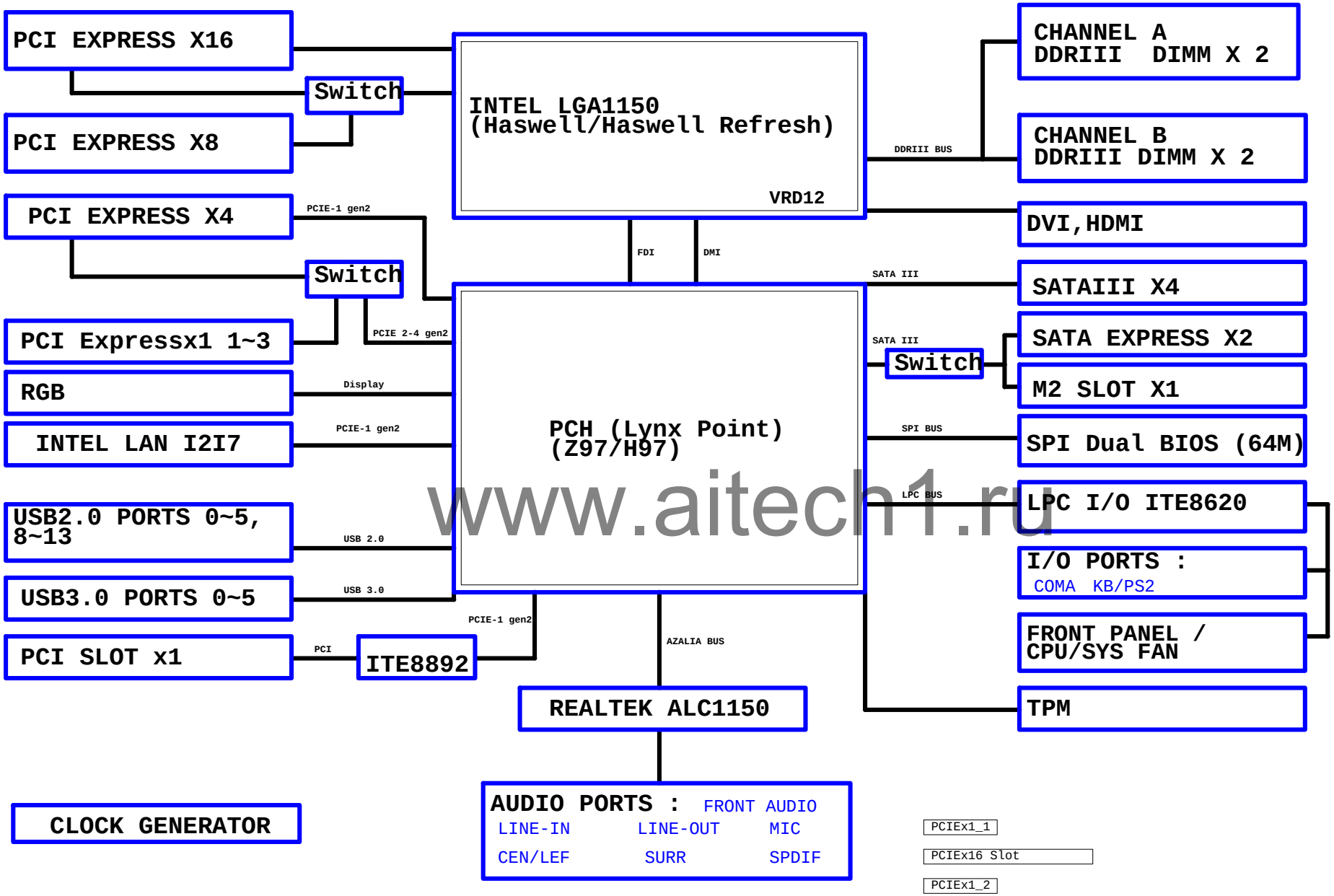
Gigabyte Technology

Title: BOM & PCB MODIFY HISTORY

Size: Custom | Document Number: Z97X-UD3H | Rev: 1.0

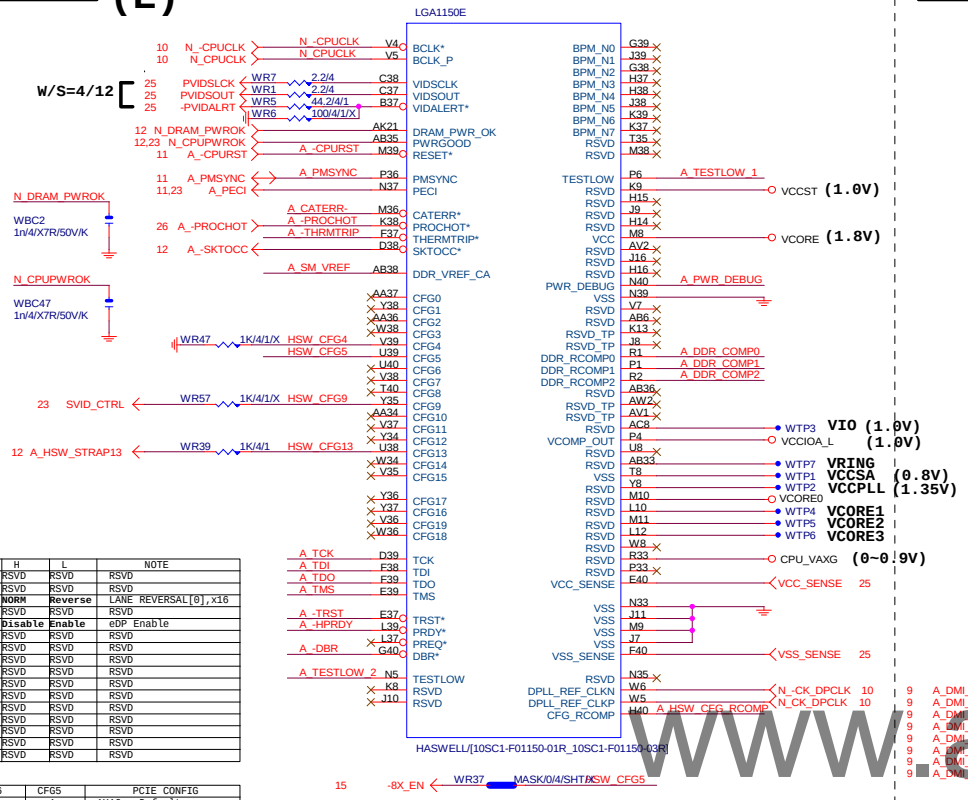
Date: Tuesday, April 08, 2014 | Sheet 2 of 37

BLOCK DIAGRAM



Gigabyte Technology		
Title: BLOCK DIAGRAM		
Size: C	Document Number: Z97X-UD3H	Rev: 1.0
Date: Tuesday, April 08, 2014	Sheet 3 of 37	

LGA1150 (E)



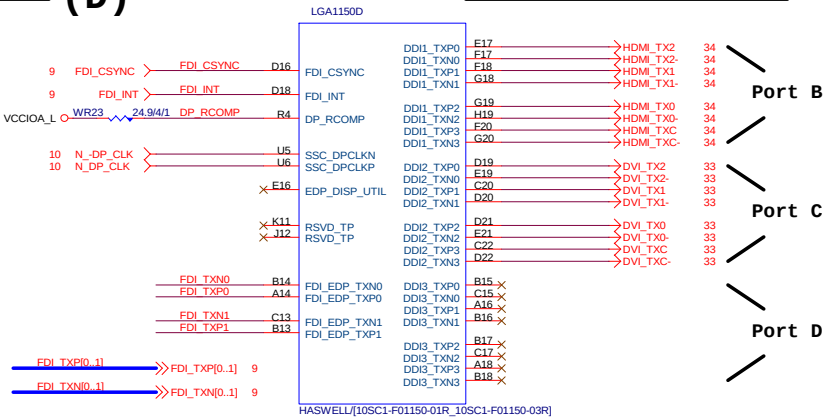
CFG	H	L	NOTE
0	RSVD	RSVD	RSVD
1	RSVD	RSVD	RSVD
2	**NORM**	**Reverse**	LANE REVERSAL[0],x16
3	RSVD	RSVD	RSVD
4	**Disable**	**Enable**	eDP Enable
7	RSVD	RSVD	RSVD
8	RSVD	RSVD	RSVD
9	RSVD	RSVD	RSVD
10	RSVD	RSVD	RSVD
11	RSVD	RSVD	RSVD
12	RSVD	RSVD	RSVD
13	RSVD	RSVD	RSVD
14	RSVD	RSVD	RSVD
15	RSVD	RSVD	RSVD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

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

CFG 0-17 all internal PULL-UP

LGA1150 (D)

HDMI需接Port B for WHQL



FDI:4/4/4//15(breakout min 4/4/4//8)
Impedance=85 +- 15%

DP/HDMI 4/4/4//20 FDI 4/4/4/12
Impedance=85 +- 15%

LGA1155 (C)

W=12 mil out of CPU
S=15 mil out of CPU

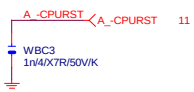
CPU PEG 5/5/5//20 Impedance=80 +- 15%

DMI 4/4/4//15 Impedance=85 +- 15%

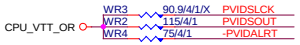
PA_EXP_TXP[0..15] → PA_EXP_TXP[0..15] 14,16
PA_EXP_TXN[0..15] → PA_EXP_TXN[0..15] 14,16
PA_EXP_RXP[0..15] → PA_EXP_RXP[0..15] 14,16
PA_EXP_RXN[0..15] → PA_EXP_RXN[0..15] 14,16

-CPURST

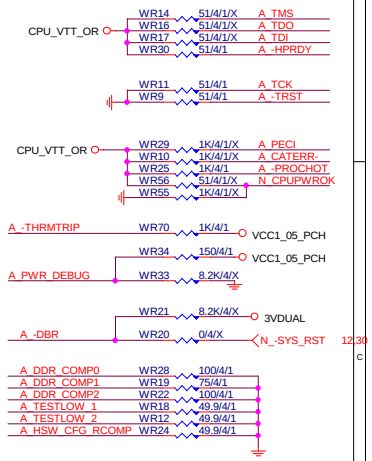
1.1V分壓

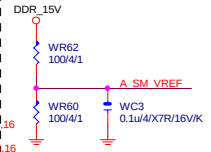


CPU SVID

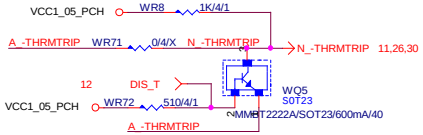


CPU PU/PD





THRMTRIP DISABLE FOR Z87 OVERCLOCK



Title	CPU LGA1150-A
Size	Custom
Document Number	Z97X-UD3H
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Date:	Tuesday, April 08, 2014
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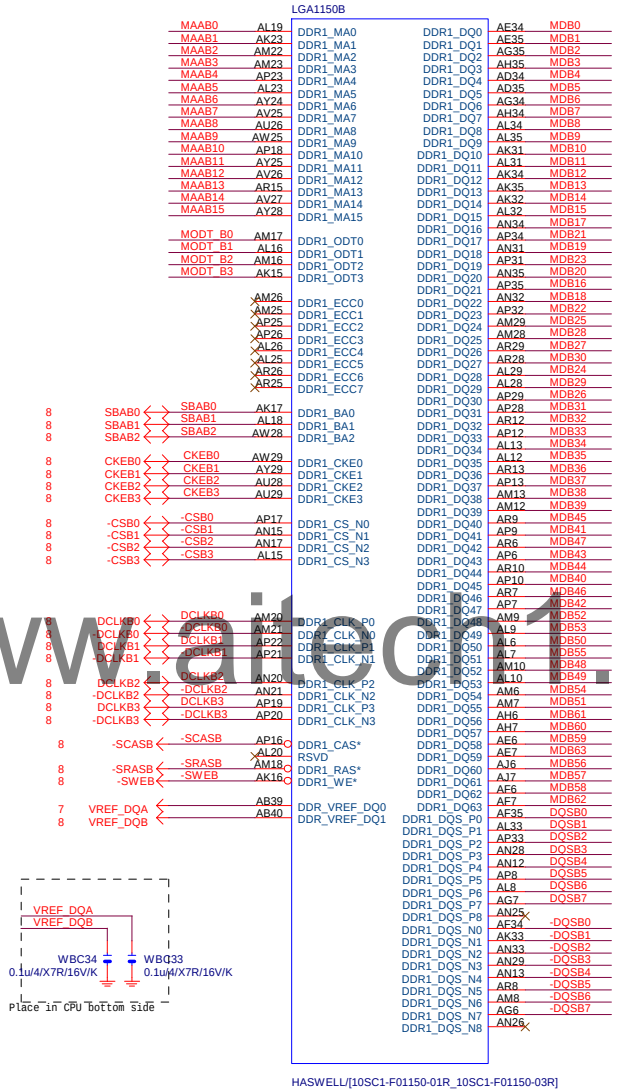
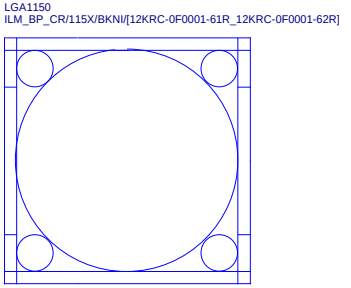
Gigabyte Technology

LGA1150 (A)

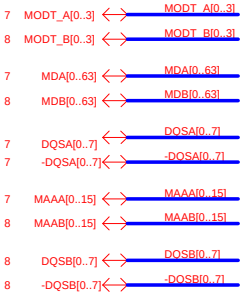
LGA1150 (B)



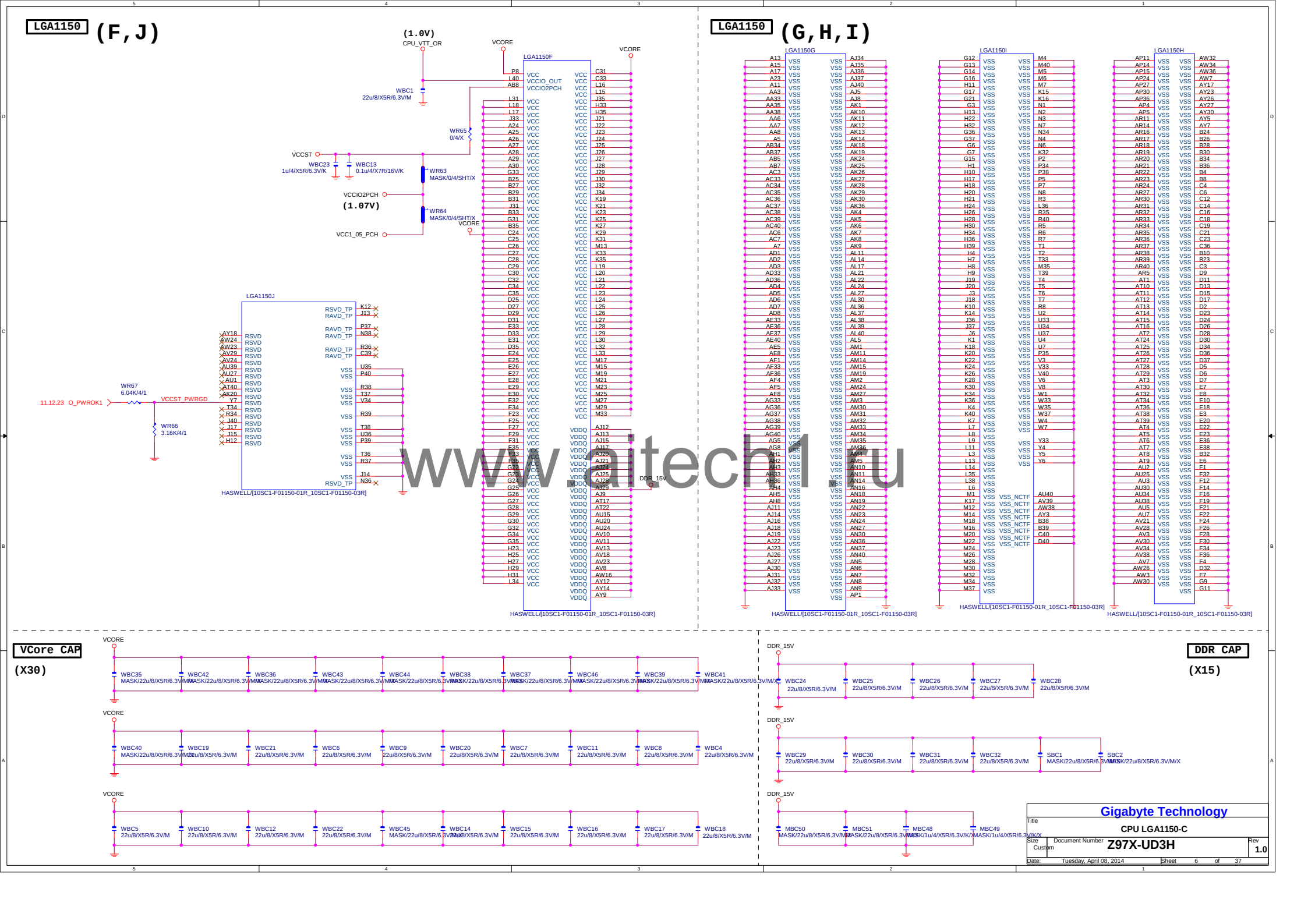
LGA1150 (CR)

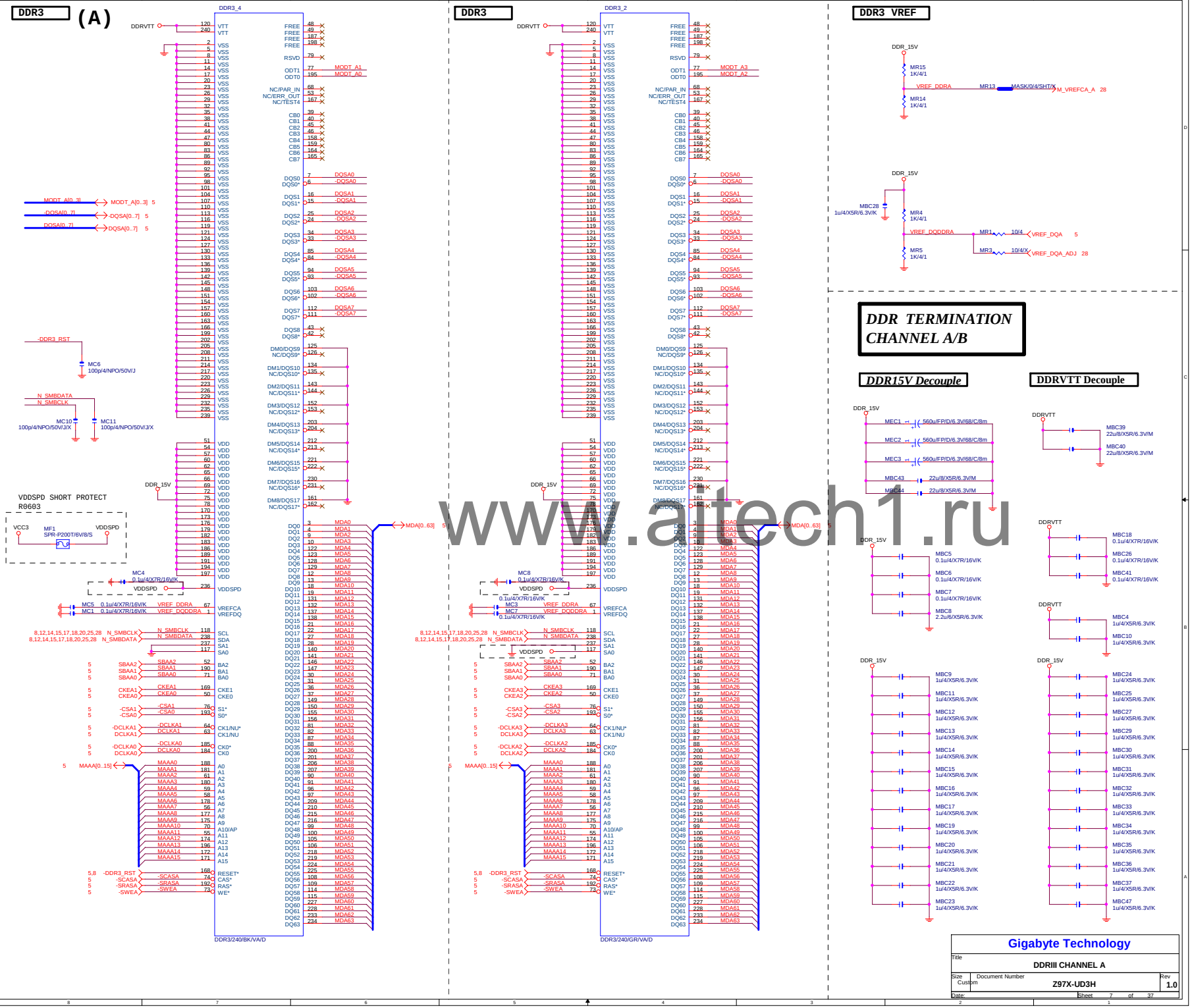


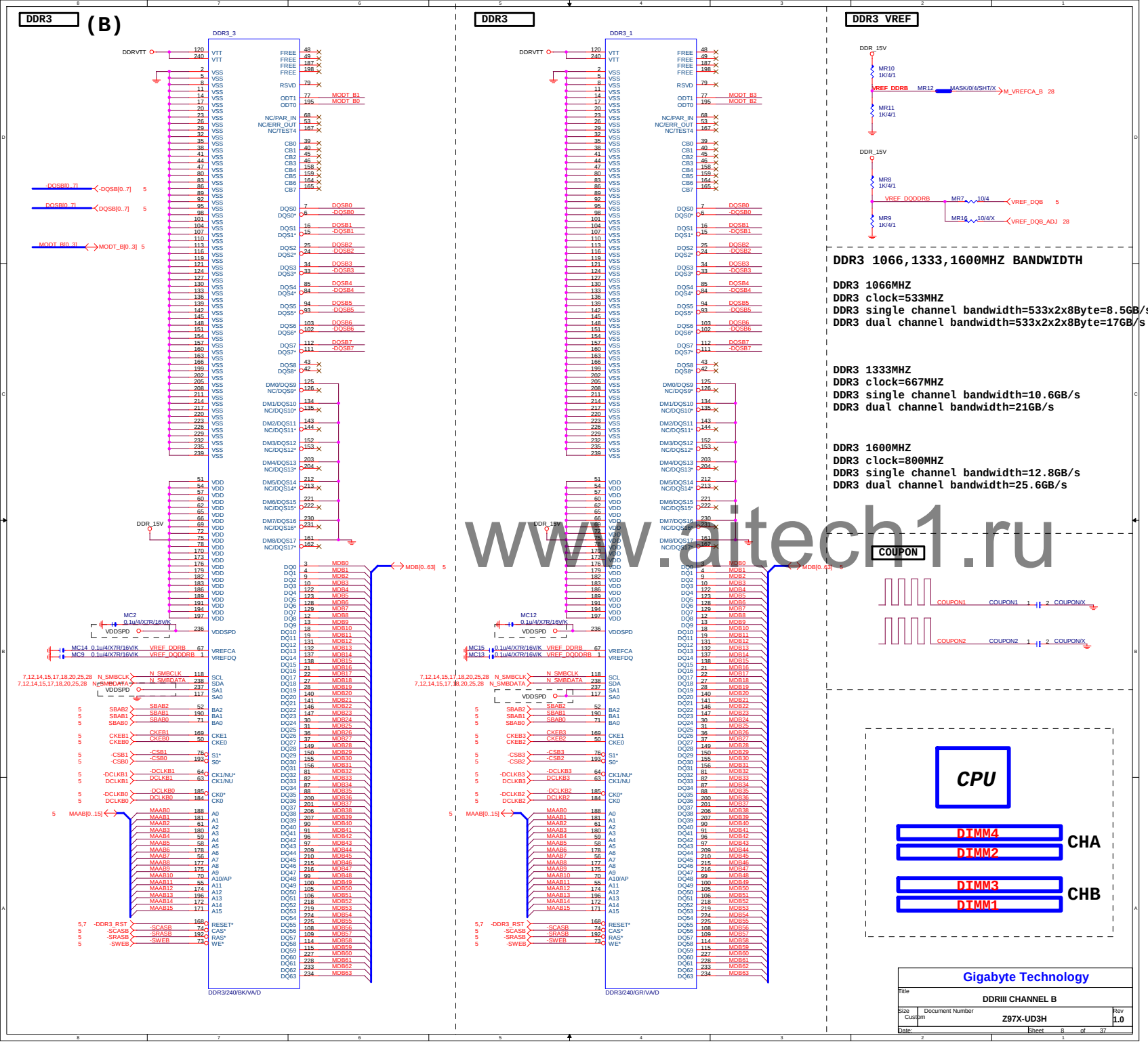
DDR BUS



Gigabyte Technology			
Title: CPU LGA1150-B			
Size: Custom	Document Number: Z97X-UD3H		Rev: 1.0
Date: Tuesday, April 08, 2014	Sheet 5 of 37		







PCH (B)

USB Port 1/9一定要接出來,For Debug port test (Logo)

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

USB2.0 : 12/5/7/5/12 (breakout min 8/4/4/4/8)
Impedance=85 +- 15%

Port要對應

REAR USB3.0
B85/H81:USB N\A

LAN E2201

ITE8892 PCI Bridge

PCIEX4 port1

PCIEX4 port2

PCIEX4 port3
PCIEX1_1

H81:PCIE 7/8X
PCIEX4 port4
PCIEX1_2

放靠近 Device & PCI-E Slot

B85/H81: 6/7 N\A

H81:USB3.0 N\A

H81:12/13 N\A

Port1 & 9為Debug Port，
一定要拉到Connector。

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

Mount for integrated clock Generation Mode

NR92 short to GND in non graphic SKU

PCH PCIE ,DMI 4/4/4//15 Impedance=85 +- 15%

usb2.0 5/7/5//12
usb3.0 5/7/5//20 Impedance=85 +- 15%

PCH (F)

FDI:12/4/5/4/12
Impedance=85 +- 17.5%

PCH (J)

PCH H/S

USB TABLE

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

USB Usage & OC# Configure			
OC0#	USB0,1	F_USB30	FUSEVCC_F1_F2
OC1#	USB2,3	USB30_LAN	FUSEVCC_R7_R8
OC2#	USB4,5	HDMI & R_USB3	FUSEVCC_R1_R2
OC3#	USB6,7	4 Ports R_USB (Up)	FUSEVCC_R5_R6
OC4#	USB8,9	4 Ports R_USB (Down)	FUSEVCC_R3_R4
OC5#	USB10,11	F_USB2	FUSEVCC_F5_F6
OC6#	USB12,13	F_USB1	FUSEVCC_F3_F4
OC7#	Not Use		

Gigabyte Technology

Title: PCH FDI,DMI,USB ,PCIE

Size: Custom | Document Number: Z97X-UD3H | Rev: 1.0

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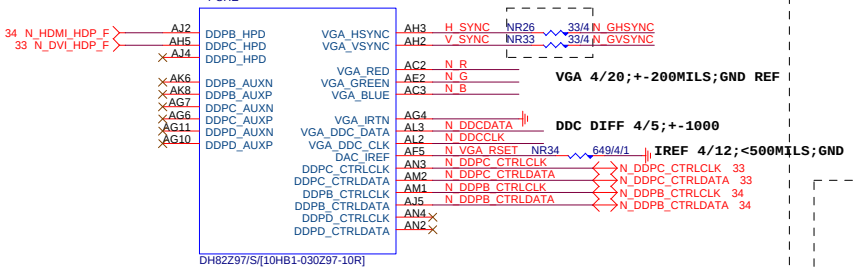
PCH (E)



CLOSE PCH<0.75";4/10;+-1000;GND

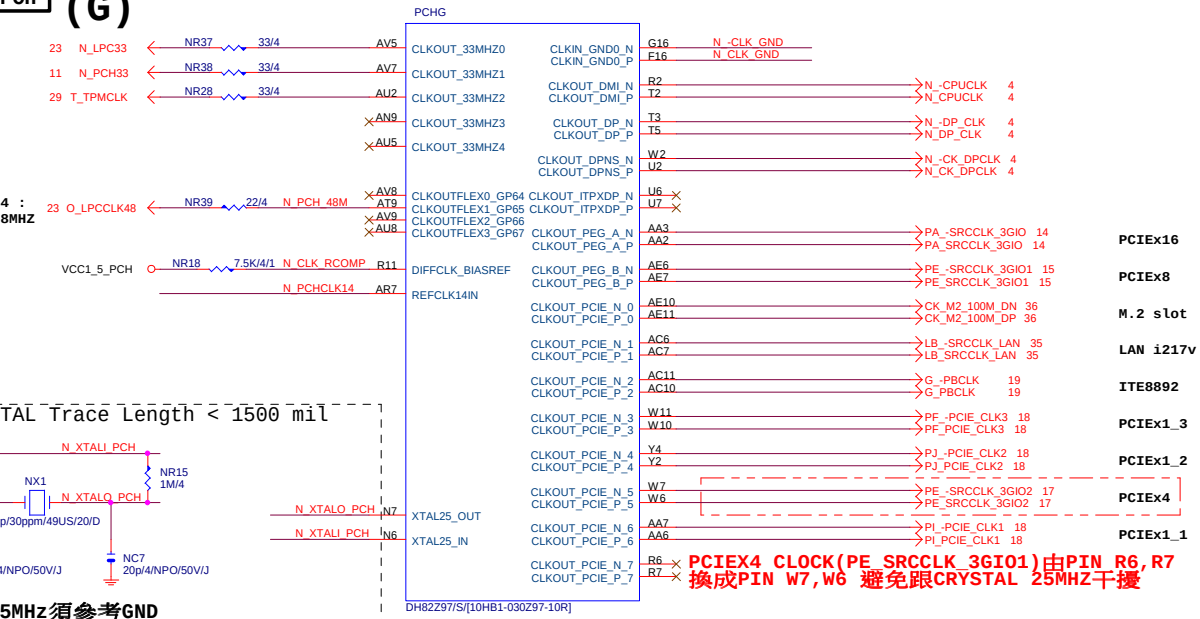
VGA 4/20;+-200MILS;GND REF

DDC DIFF 4/5;+-1000

IREF 4/12;<500MILS;GND

VGA DISABLE
R,G,B NC OR GND
IRTN / IREF GND
VGA_HSYNC, VGA_VSYNC,DDC_CLK, DDC_DATA NC
POWER VCCADAC(AF2), VCCADACBG(AE1) GND

PCH (G)



Flex1,2,3,4 : 14/24/33/48MHZ

PCIEx16

PCIEx8

M.2 slot

LAN i217v

ITE8892

PCIEx1_3

PCIEx1_2

PCIEx4

PCIEx1_1

PCIEX4 CLOCK(PE_SRCCLK_3GIO1)由PIN R6,R7 換成PIN W7,W6 避免跟CRYSTAL 25MHZ干擾

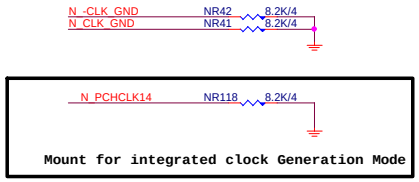
XTAL Trace Length < 1500 mil

X'TAL 25MHz須參考GND
CRYSTAL/TRACE 週邊不要有訊號,VIA靠近
走線遠離其他40mil以上

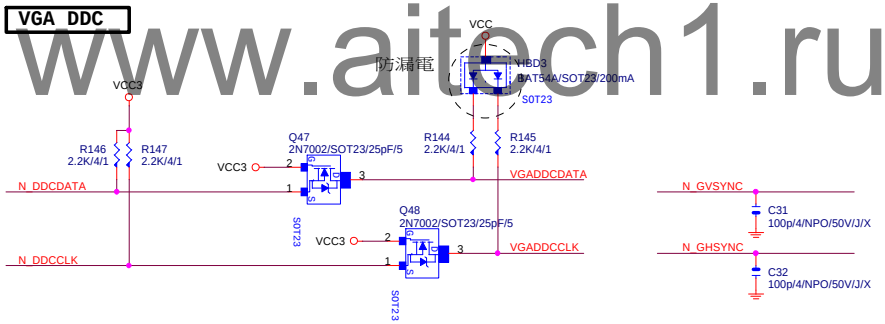
M2 Clock需接Clock#0

Differential Clock:18/4/6/4/18
Impedance=90 +- 15%

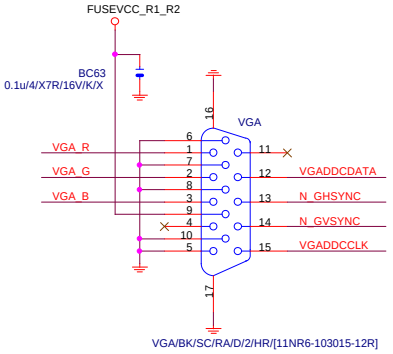
PCH CLK PD



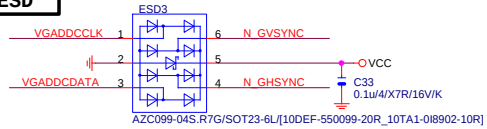
VGA DDC



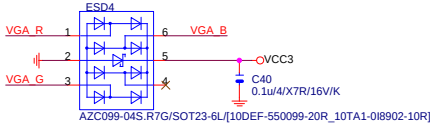
VGA CONNECTOR



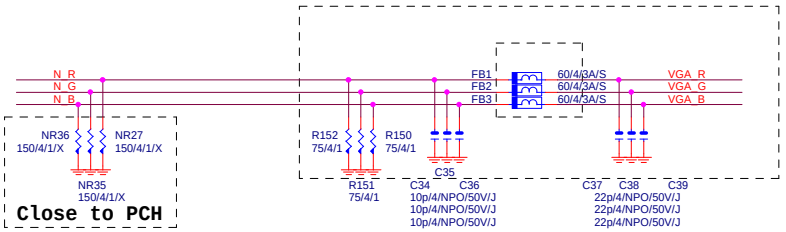
VGA ESD



SSOP6_ESD



VGA DDC



Close to VGA connector

Gigabyte Technology		
Title: PCH DISPLAY ,CLK BUFFER		
Size: Custom	Document Number: Z97X-UD3H	Rev: 1.0
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PCH (C)

SATA3 : 20/4/4/4/20 (breakout min 8/4/4/4/8)
Impedance=85 +- 17.5%
SATA2 4/4/4//15
SATA3 4/4/4//20

PCHC

CL_CLK
CL_DATA
CL_RSTB
APWROK
PWM0
PWM1
PWM2
PWM3
TACH0_GP17
TACH1_GP1
TACH2_GP6
TACH3_GP7
TACH4_GP68
TACH5_GP69
SSTCTL
SCLOCK_GP22
SLOAD_GP38
SDATAOUT0_GP39
SDATAOUT1_GP48

SATA_RXN_0 SATA_RXP_0 SATA_TXN_0 SATA_TXP_0 SATA_RXN_1 SATA_RXP_1 SATA_TXN_1 SATA_TXP_1
SATA_RXN_2 SATA_RXP_2 SATA_TXN_2 SATA_TXP_2 SATA_RXN_3 SATA_RXP_3 SATA_TXN_3 SATA_TXP_3
SATA_RXN_4_PCIE_PERN_1 SATA_RXP_4_PCIE_PERP_1 SATA_TXN_4_PCIE_PETN_1 SATA_TXP_4_PCIE_PETP_1
SATA_RXN_5_PCIE_PERN_2 SATA_RXP_5_PCIE_PERP_2 SATA_TXN_5_PCIE_PETN_2 SATA_TXP_5_PCIE_PETP_2
CLKIN_SATA_N CLKIN_SATA_P
SATALEDB SATA_RCOMP
SATA0GP_GP21 SATA1GP_GP19 SATA2GP_GP36 SATA3GP_GP37 SATA4GP_GP16 SATA5GP_GP49
EDP_BKLTCTL EDP_BKLTEN EDP_VDDEN
RSVD RCINB SERIRQ THRMTRIPB PECI PM_SYNCH PLTRST_PROCB

H81 6G
B85 6G
H81 X
B85/H81 3G

DH82Z97/S/{10HB1-030Z97-10R}

PCH (A)

PCHA

3VDUAL_PCH
PMEB
CLKIN_33MHZLOOPBACK
TP16 TP17 TP18 TP19 TD_IREF
PIRQAB PIRQBB PIRQCB PIRQDB
GPIO2 GPIO3 GPIO4 GPIO5
PLTRSTB
GP35/NMIB GP50 GP51 GP52 GP53 GP54 GP55

DH82Z97/S/{10HB1-030Z97-10R}

BOOT DEVICE	GP51	GP19
LPC	0	0
SPI	float	float

Default int pull up on GP51,
Default SPI boot devices

PCH CLK PD

CK_SRCCLK_SATA NR174 8.2K/4
CK_-SRCCLK_SATA NR173 8.2K/4

Mount for integrated clock Generation Mode

PCH PU/PD

NRN2 8.2K/8P4R/4
NRN3 8.2K/8P4R/4
NRN7 8.2K/8P4R/4
NRN11 8.2K/8P4R/4
NRN12 8.2K/8P4R/4
NRN13 8.2K/8P4R/4
NRN4 8.2K/8P4R/4

N_GPIO55:A16 SWAP OVERRIDE
N_GPIO53:DMI AC COUPLING
N_GPIO22:PCH CONFIG
N_GPIO39:GFX MODE
N_GPIO49:PCIE/MSATA MUX SELECT
N_GPIO36:DMI RX TERMINATION
N_GPIO69:SVID DETECT

soft strap	GP16	GP49
0	pcie1	pcie2
1	sata4	sata5

ME PWROK

ND2 BAT54A/SOT23/200mA
NQ15 S0T23 MMBT2222A/SOT23/600mA/40
NQ16 S0T23 MMBT2222A/SOT23/600mA/40
NC49 0.01u/4/X7R/25V/K
NC50 1u/4/X5R/6.3V/K

TLS Setting enable for SBA

N_GPIO37 For H97/H87/B85

SATA CONNECTOR

SATA3_0_1
SATA/14/BK/H/OP/RA/D/2

GPIO38 Ctrl

MFG Mode

N_GPIO38 : Lo --> Enable
Hi --> Disable

NQ13 S0T23 MMBT2222A/SOT23/600mA/40

Gigabyte Technology

Title: PCH HOST , SATA, PCI

Size: Custom | Document Number: Z97X-UD3H | Rev: 1.0

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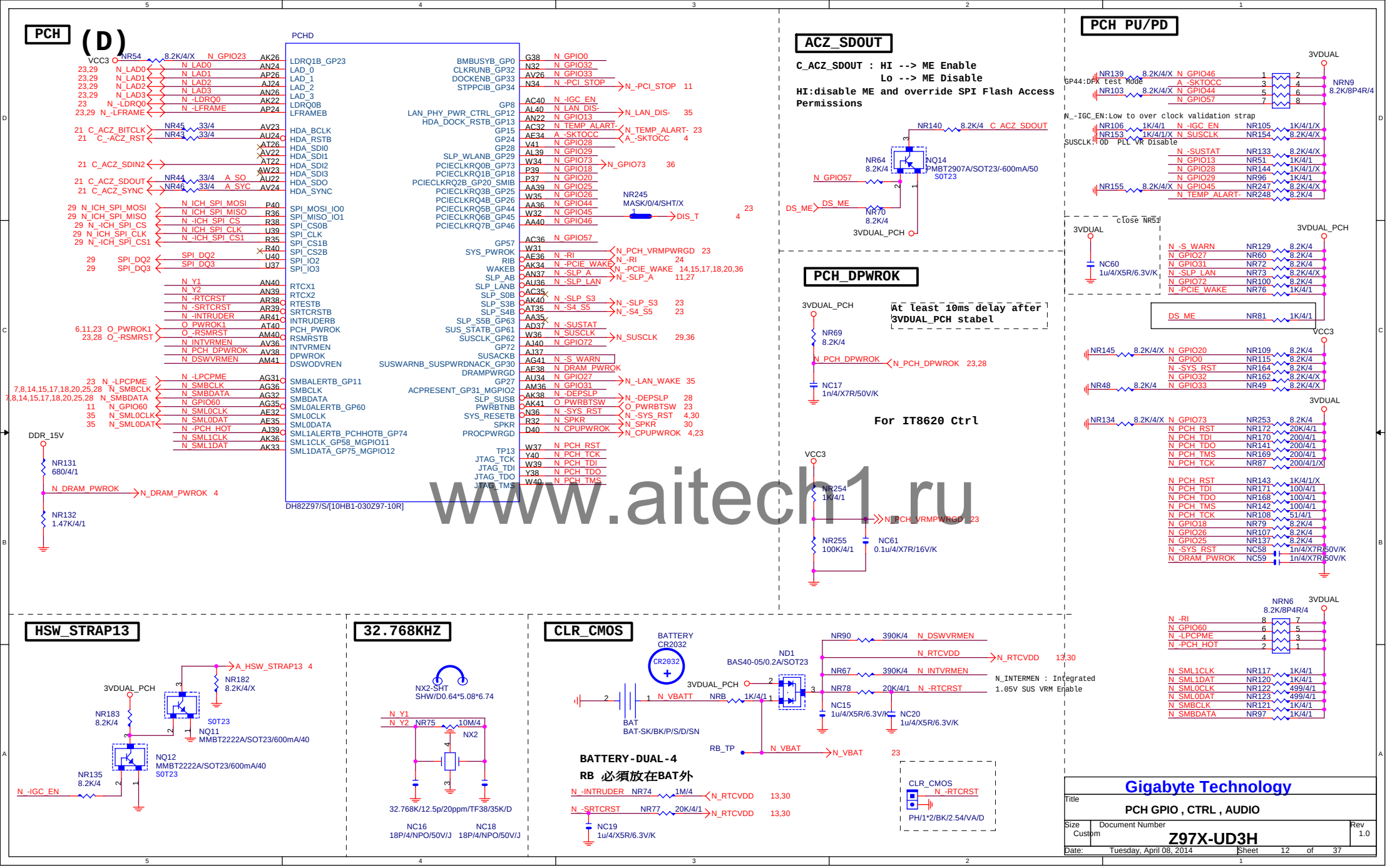
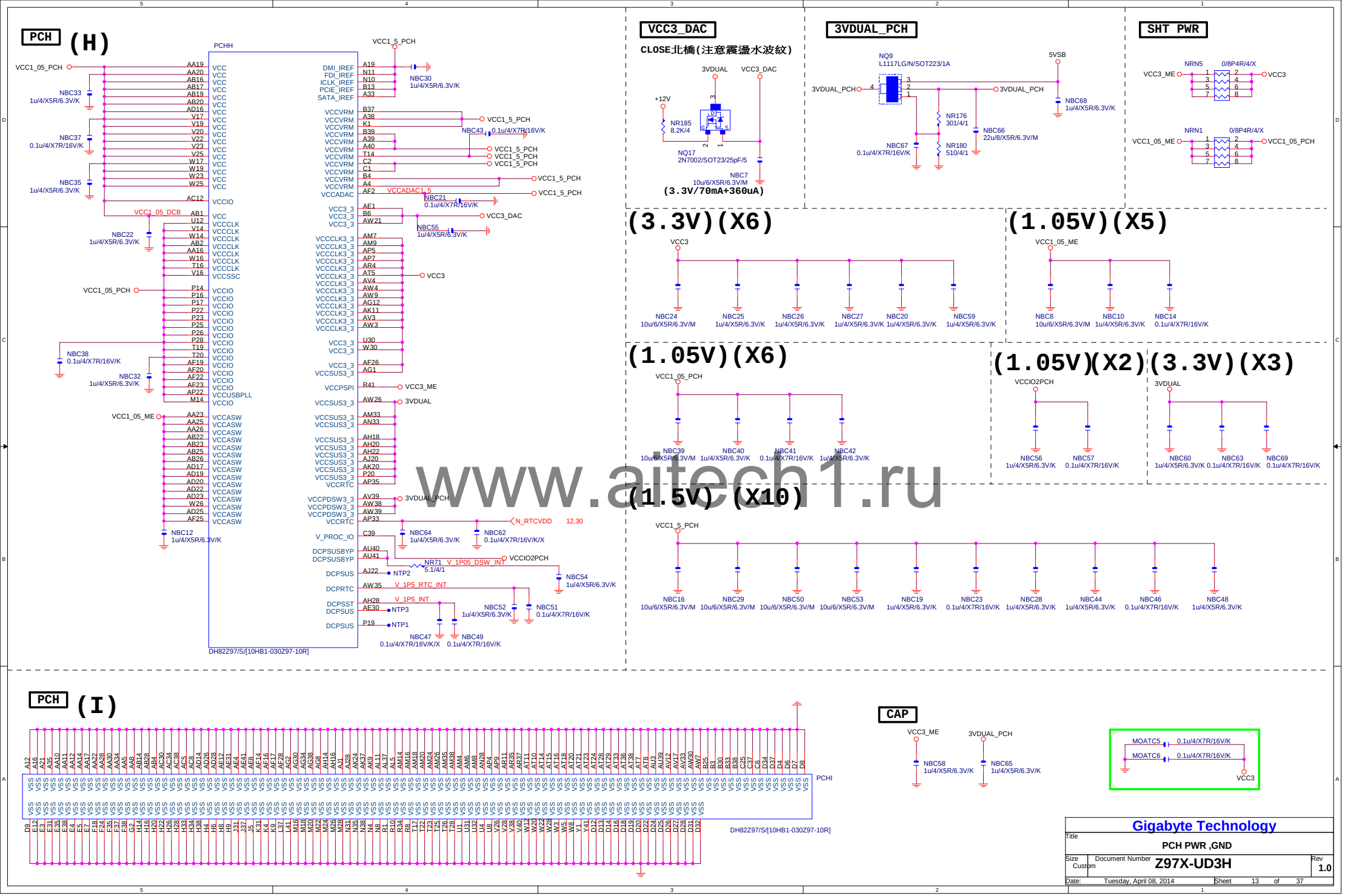
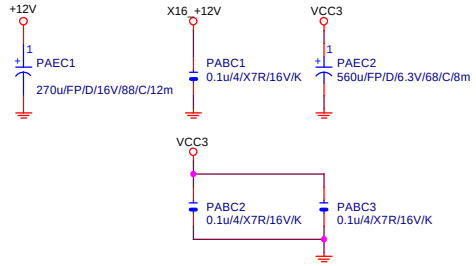

PCH
(D)
PCHD
DH82Z97/S/[10HB1-030Z97-10R]
ACZ_SDOUT
C_ACZ_SDOUT : HI --> ME Enable
Lo --> ME Disable
HI:disable ME and override SPI Flash Access Permissions
PCH_DPWROK
At least 10ms delay after 3VDUAL_PCH stabel
For IT8620 Ctrl
PCH PU/PD
HSW_STRAP13
32.768KHZ
CLR_CMOS
BATTERY-DUAL-4
RB 必須放在BAT外
www.aitech1.ru
Gigabyte Technology
PCH GPIO , CTRL , AUDIO
Z97X-UD3H
Tuesday, April 08, 2014

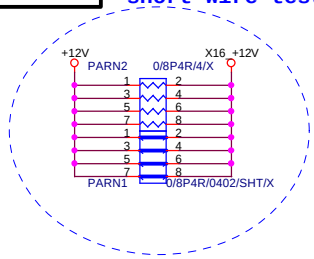


PCIEX16 CAP



PCIEX16 PROTECT SHT

+12 protect short-wire test



PCIEX16 AC CAP

PA_EXP_TXP0	PAC5	0.22u/4/X5R/6.3V/K	PA_EXP_TXP0_C
PA_EXP_TXN0	PAC4	0.22u/4/X5R/6.3V/K	PA_EXP_TXN0_C
PA_EXP_TXP1	PAC6	0.22u/4/X5R/6.3V/K	PA_EXP_TXP1_C
PA_EXP_TXN1	PAC7	0.22u/4/X5R/6.3V/K	PA_EXP_TXN1_C
PA_EXP_TXP2	PAC8	0.22u/4/X5R/6.3V/K	PA_EXP_TXP2_C
PA_EXP_TXN2	PAC9	0.22u/4/X5R/6.3V/K	PA_EXP_TXN2_C
PA_EXP_TXP3	PAC10	0.22u/4/X5R/6.3V/K	PA_EXP_TXP3_C
PA_EXP_TXN3	PAC11	0.22u/4/X5R/6.3V/K	PA_EXP_TXN3_C
PA_EXP_TXP4	PAC12	0.22u/4/X5R/6.3V/K	PA_EXP_TXP4_C
PA_EXP_TXN4	PAC13	0.22u/4/X5R/6.3V/K	PA_EXP_TXN4_C
PA_EXP_TXP5	PAC14	0.22u/4/X5R/6.3V/K	PA_EXP_TXP5_C
PA_EXP_TXN5	PAC15	0.22u/4/X5R/6.3V/K	PA_EXP_TXN5_C
PA_EXP_TXP6	PAC16	0.22u/4/X5R/6.3V/K	PA_EXP_TXP6_C
PA_EXP_TXN6	PAC17	0.22u/4/X5R/6.3V/K	PA_EXP_TXN6_C
PA_EXP_TXP7	PAC18	0.22u/4/X5R/6.3V/K	PA_EXP_TXP7_C
PA_EXP_TXN7	PAC19	0.22u/4/X5R/6.3V/K	PA_EXP_TXN7_C
PA_EXP_SW_TXP8	PAC21	0.22u/4/X5R/6.3V/K	PA_EXP_SW_TXP8_C
PA_EXP_SW_TXN8	PAC20	0.22u/4/X5R/6.3V/K	PA_EXP_SW_TXN8_C
PA_EXP_SW_TXP9	PAC22	0.22u/4/X5R/6.3V/K	PA_EXP_SW_TXP9_C
PA_EXP_SW_TXN9	PAC23	0.22u/4/X5R/6.3V/K	PA_EXP_SW_TXN9_C
PA_EXP_SW_TXP10	PAC24	0.22u/4/X5R/6.3V/K	PA_EXP_SW_TXP10_C
PA_EXP_SW_TXN10	PAC25	0.22u/4/X5R/6.3V/K	PA_EXP_SW_TXN10_C
PA_EXP_SW_TXP11	PAC26	0.22u/4/X5R/6.3V/K	PA_EXP_SW_TXP11_C
PA_EXP_SW_TXN11	PAC27	0.22u/4/X5R/6.3V/K	PA_EXP_SW_TXN11_C
PA_EXP_SW_TXP12	PAC28	0.22u/4/X5R/6.3V/K	PA_EXP_SW_TXP12_C
PA_EXP_SW_TXN12	PAC29	0.22u/4/X5R/6.3V/K	PA_EXP_SW_TXN12_C
PA_EXP_SW_TXP13	PAC30	0.22u/4/X5R/6.3V/K	PA_EXP_SW_TXP13_C
PA_EXP_SW_TXN13	PAC31	0.22u/4/X5R/6.3V/K	PA_EXP_SW_TXN13_C
PA_EXP_SW_TXP14	PAC32	0.22u/4/X5R/6.3V/K	PA_EXP_SW_TXP14_C
PA_EXP_SW_TXN14	PAC33	0.22u/4/X5R/6.3V/K	PA_EXP_SW_TXN14_C
PA_EXP_SW_TXP15	PAC34	0.22u/4/X5R/6.3V/K	PA_EXP_SW_TXP15_C
PA_EXP_SW_TXN15	PAC35	0.22u/4/X5R/6.3V/K	PA_EXP_SW_TXN15_C

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

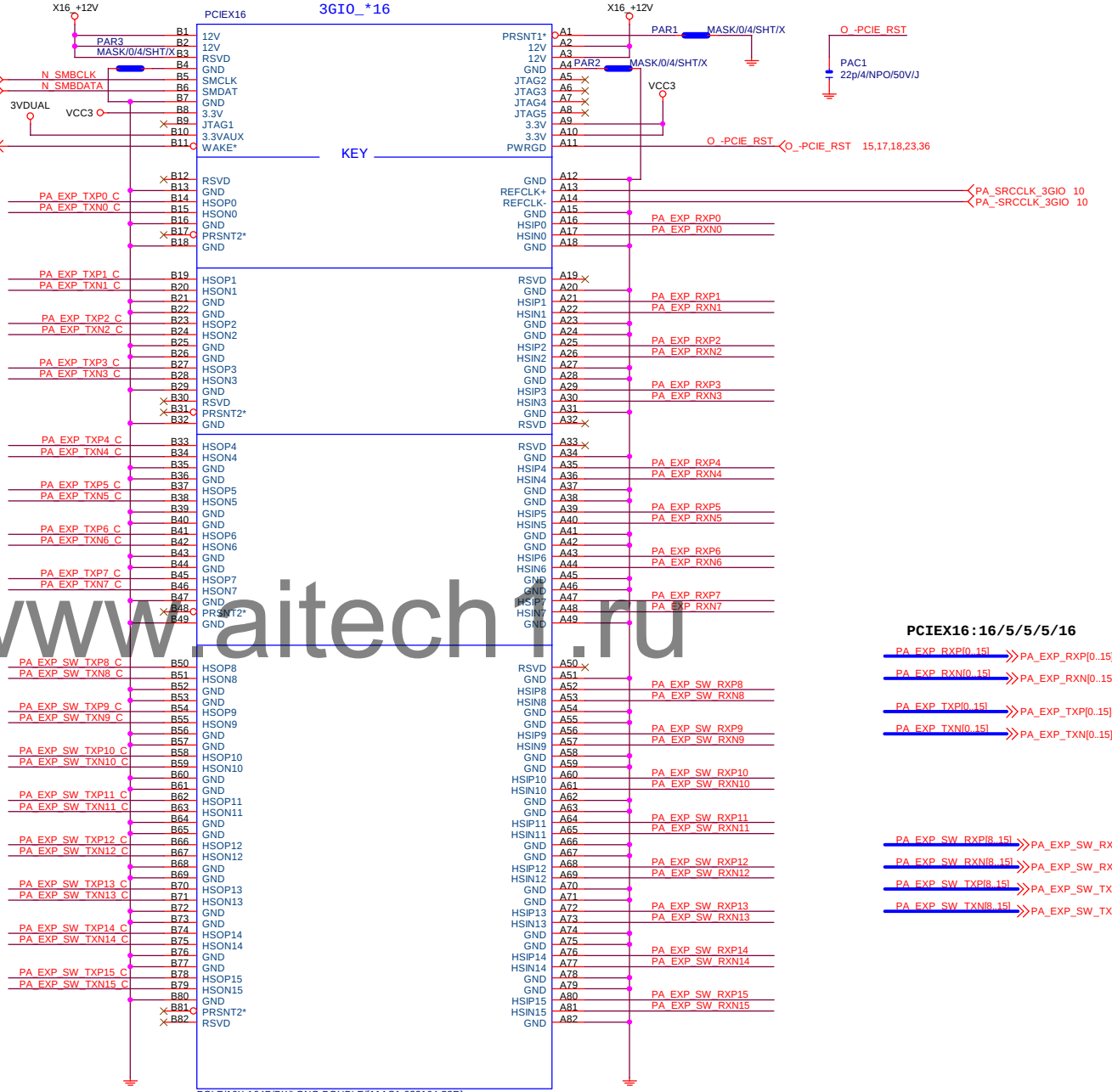
PCE-E X16(單向) BANDWITH=2.5GHz*(8b/10b)X16=32Gb/s=4GB/s

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

PCI-E REV:2.0--> 5GHZ

PCIEX16 SLOT

PCIESLOT-164DN-Q



PCIEX16:16/5/5/5/16

PA_EXP_RXP[0..15] → PA_EXP_RXP[0..15] 4,16

PA_EXP_RXN[0..15] → PA_EXP_RXN[0..15] 4,16

PA_EXP_TXP[0..15] → PA_EXP_TXP[0..15] 4,16

PA_EXP_TXN[0..15] → PA_EXP_TXN[0..15] 4,16

PA_EXP_SW_RXP[8..15] → PA_EXP_SW_RXP[8..15] 16

PA_EXP_SW_RXN[8..15] → PA_EXP_SW_RXN[8..15] 16

PA_EXP_SW_TXP[8..15] → PA_EXP_SW_TXP[8..15] 16

PA_EXP_SW_TXN[8..15] → PA_EXP_SW_TXN[8..15] 16

Gigabyte Technology			
Title: PCI EXPRESS * 16			
Size: Custom	Document Number: Z97X-UD3H		Rev: 1.0
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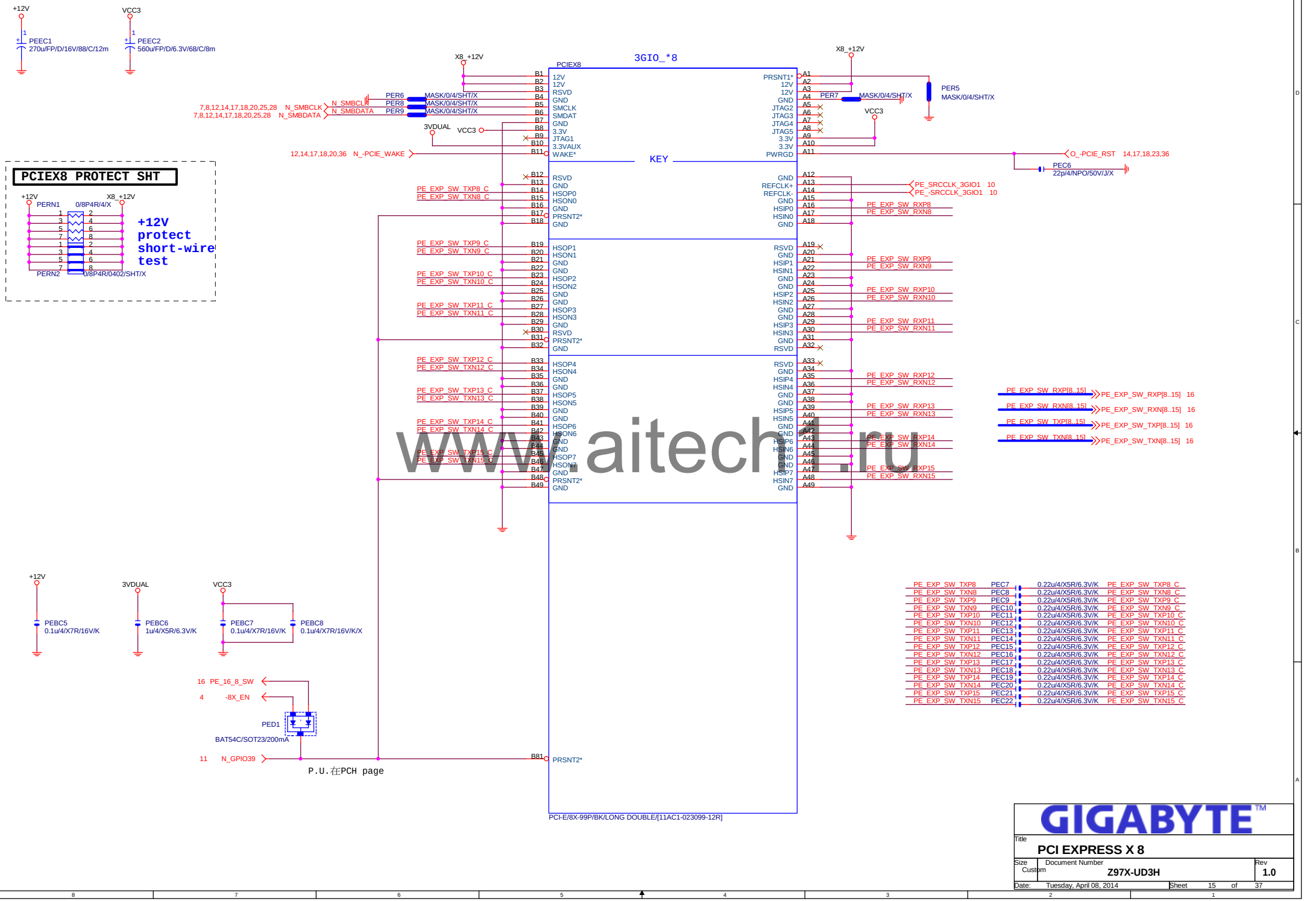

Title	PCI EXPRESS X 8
Size	Custom
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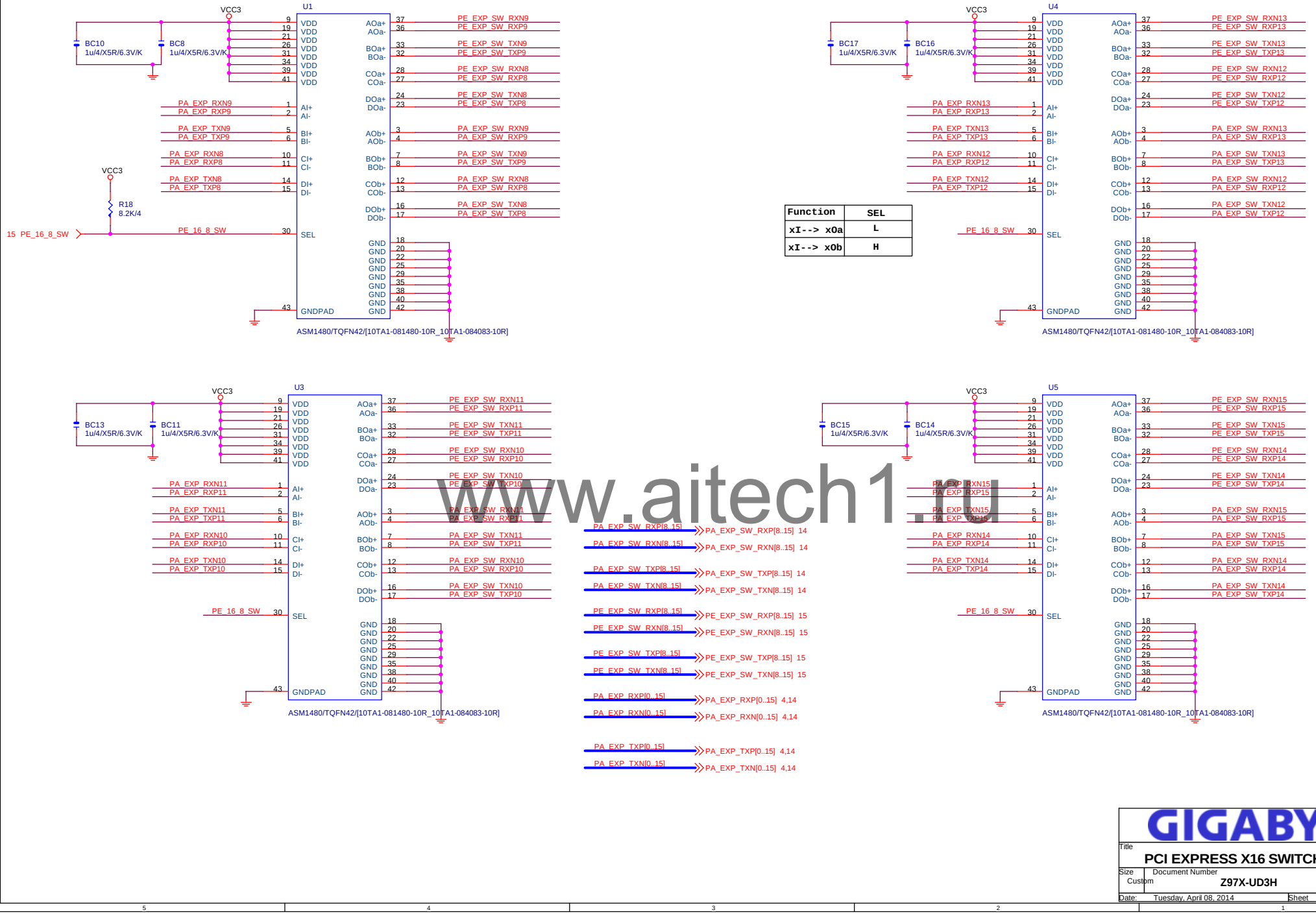
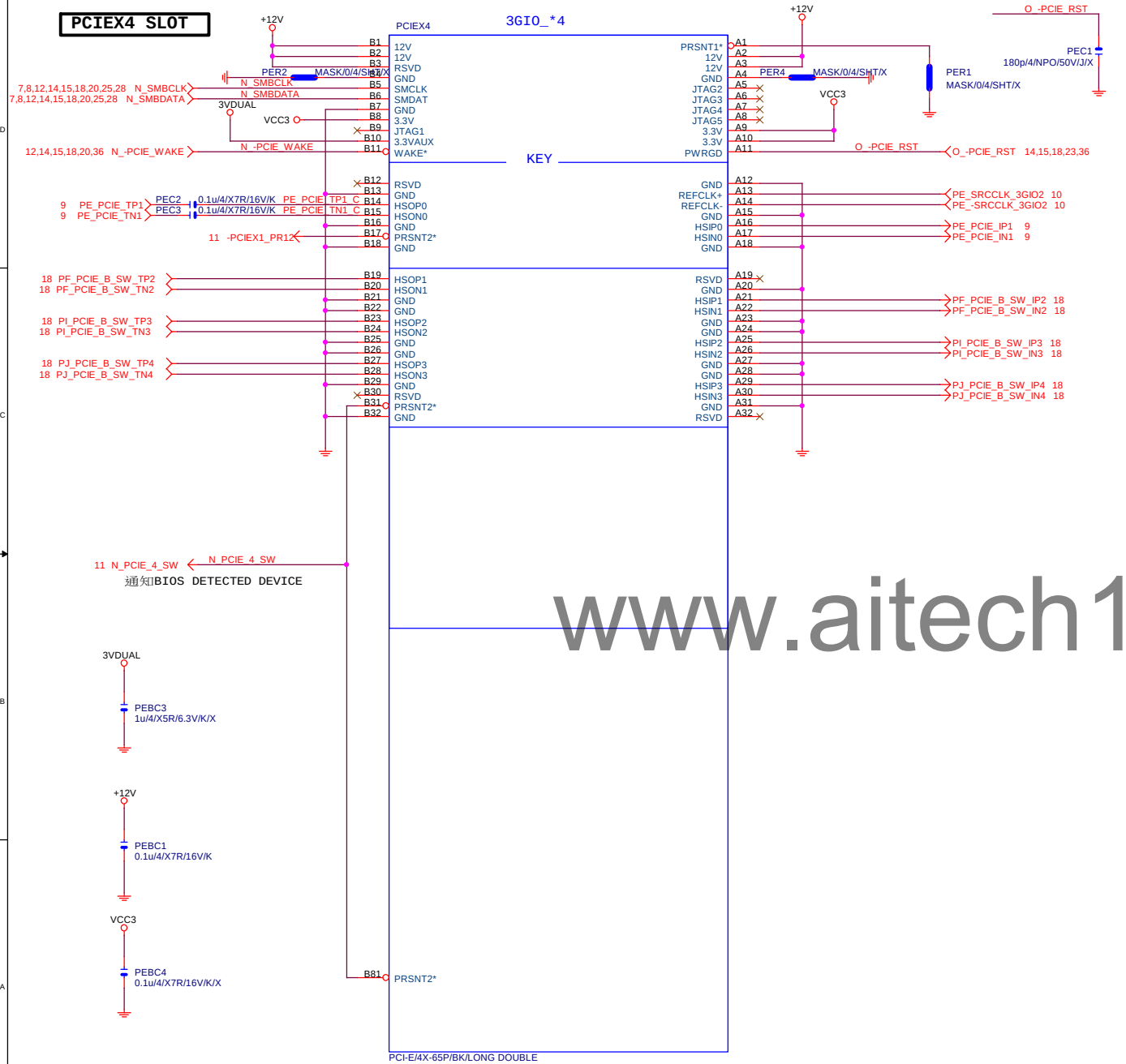
Rev	1.0
Date:	Tuesday, April 08, 2014
Sheet	15 of 37





	N_PCIE_4_SW (PCH_GPIO48)	PCIEX4_X1 (SIO_GPIO27)
P EX1,PCIEX4 --> X1 (Default)	H	H
PCIEX4 No devices PCIEX4 -> X1	H	H
PCIEX4 Have devices PCIEX4 -> X4 PCIEX1_1/2 --> N/A	L	L

Gigabyte Technology

Title: PCIE_X1 1,2

Size: Custom | Document Number: Z97X-UD3H | Rev: 1.0

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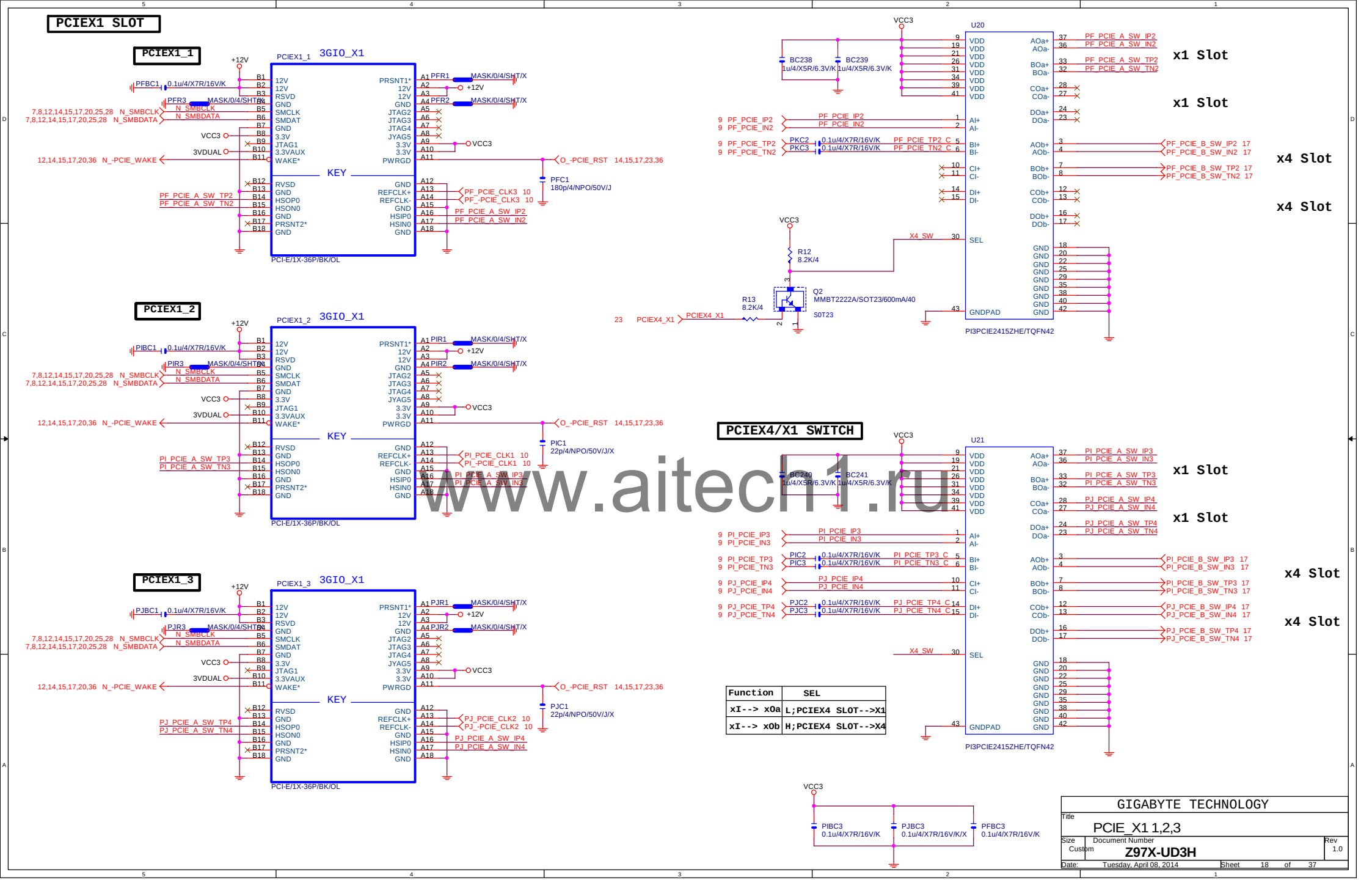

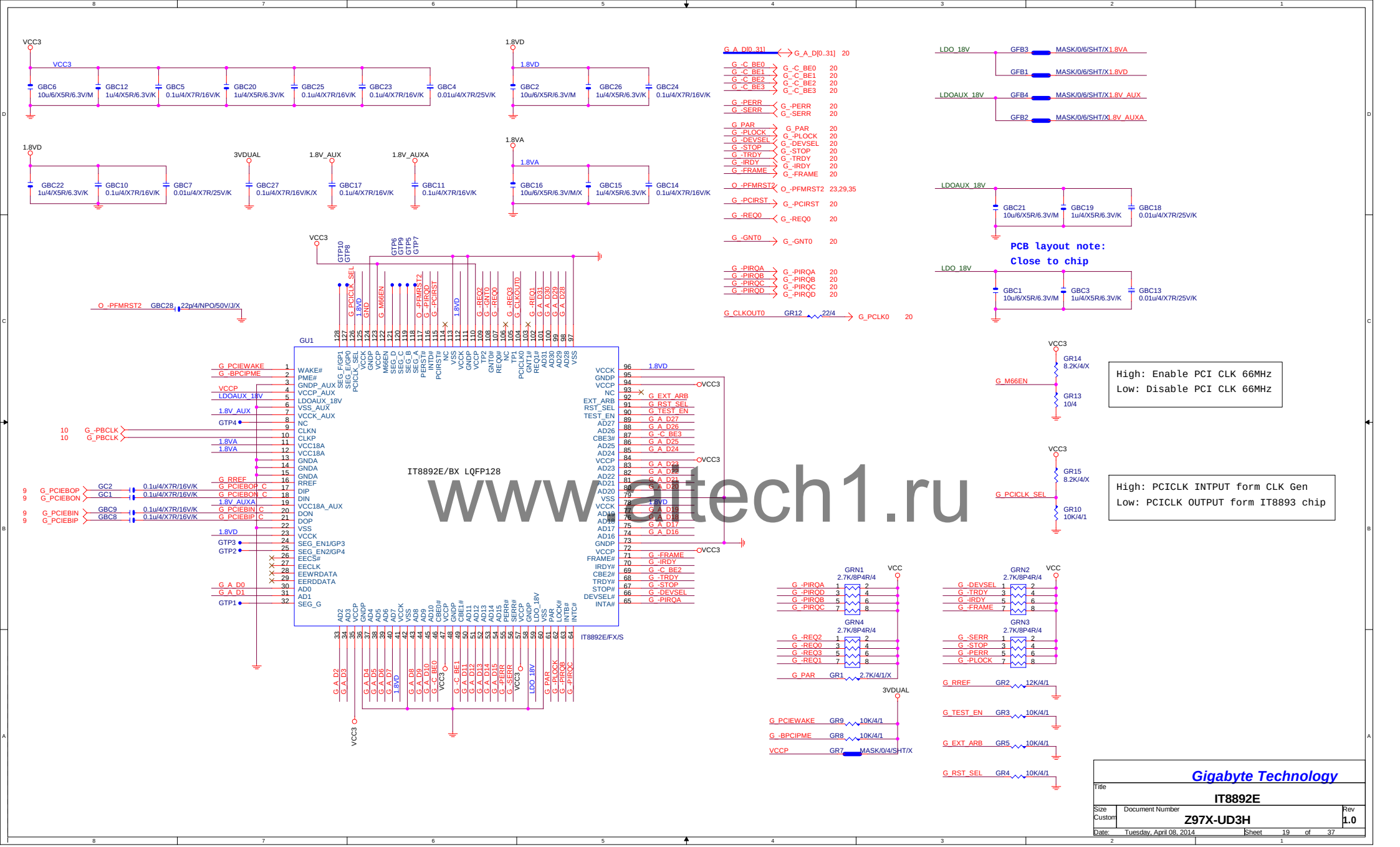

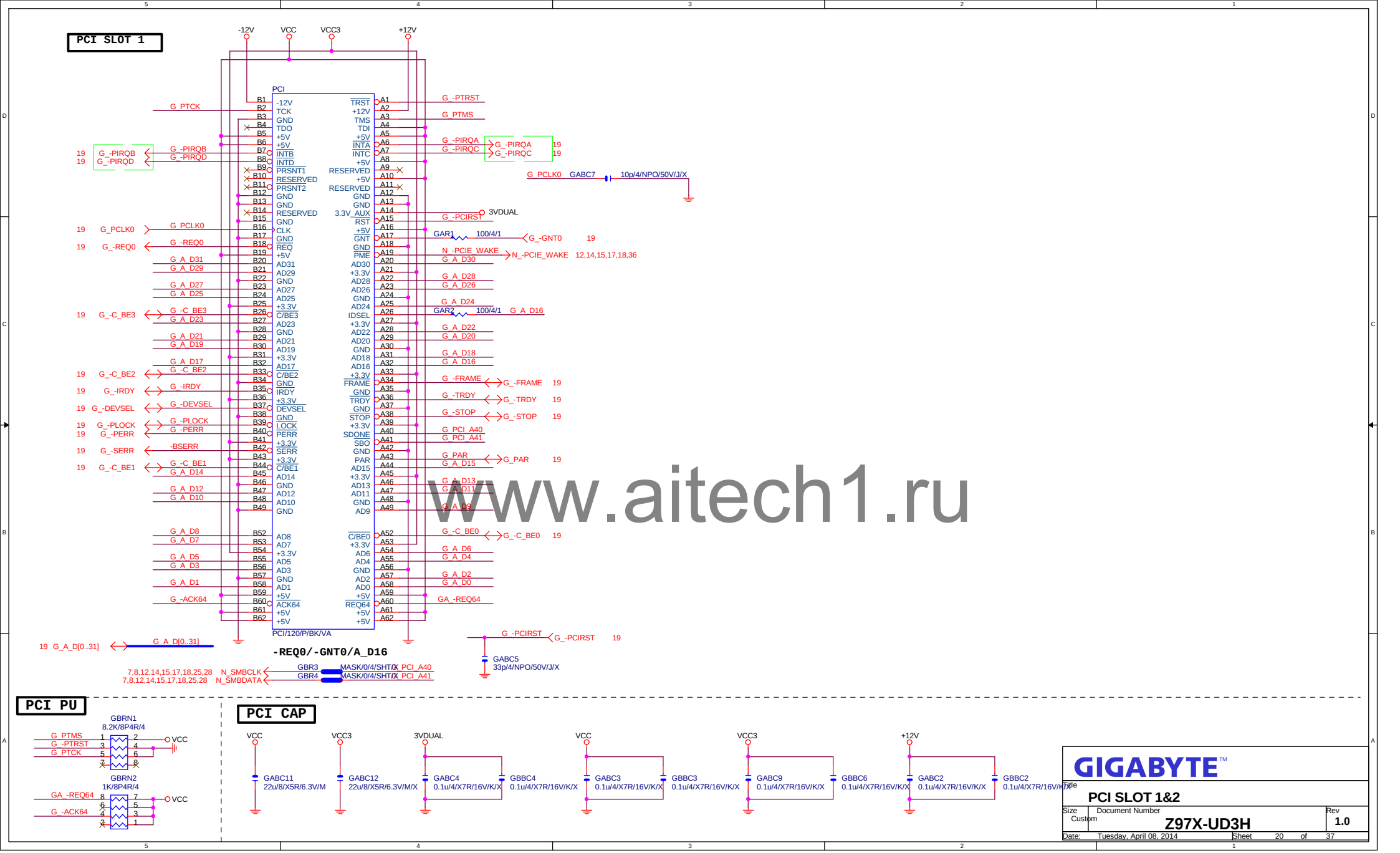

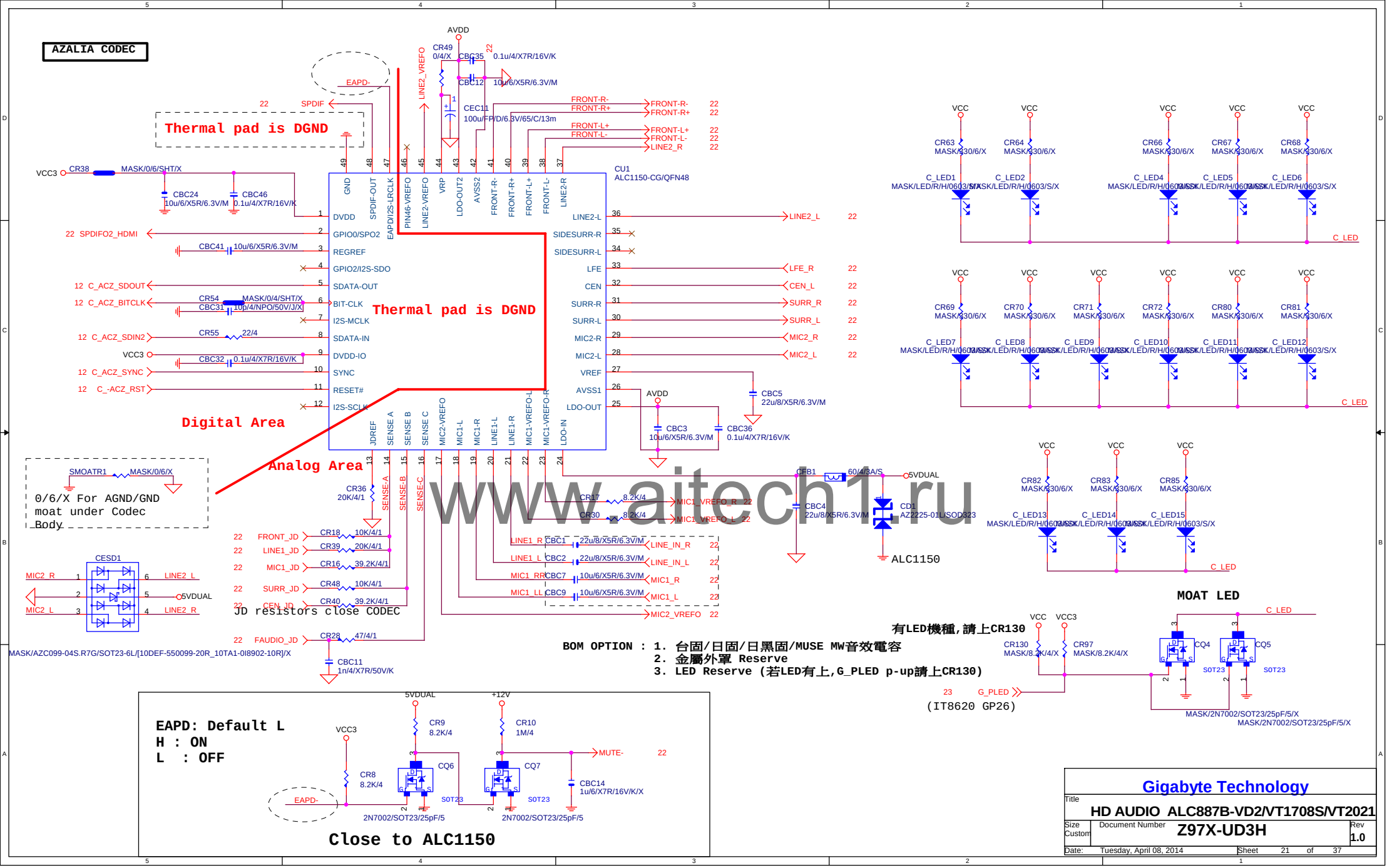
AZALIA CODEC
Thermal pad is DGND
Thermal pad is DGND
Digital Area
Analog Area
CU1
ALC1150-CG/QFN48
0/6/X For AGND/GND
moat under Codec
Body
JD resistors close CODEC
ALC1150
MOAT LED
有LED機種,請上CR130
(IT8620 GP26)
BOM OPTION : 1. 台固/日固/日黑固/MUSE MW音效電容
2. 金屬外罩 Reserve
3. LED Reserve (若LED有上,G_PLED p-up請上CR130)
EAPD: Default L
H : ON
L : OFF
Close to ALC1150
www.aitech1.ru
Gigabyte Technology
HD AUDIO ALC887B-VD2/VT1708S/VT2021
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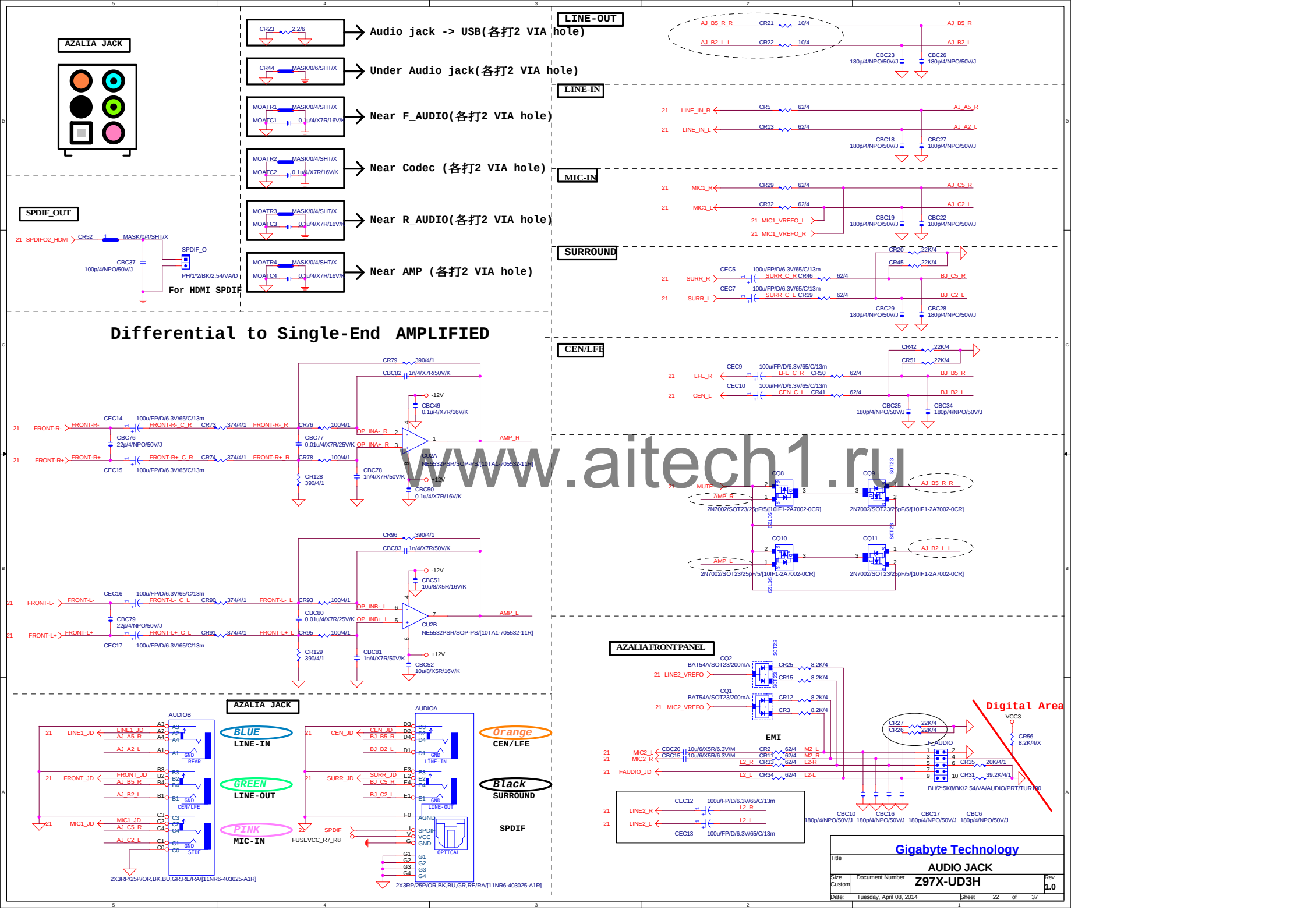
AZALIA JACK
SPDIF_OUT
21 SPDIFO2_HDMI
CR52
MASK/0/4/SHT/X
SPDIF_O
CBC37
100p/4/NPO/50V/J
PH/1*2/BK/2.54/VA/D
For HDMI SPDIF
CR23
2.2/6
Audio jack -> USB(各打2 VIA hole)
CR44
MASK/0/6/SHT/X
Under Audio jack(各打2 VIA hole)
MOATR1
MOATC1
0.1u/4/X7R/16V/K
Near F_AUDIO(各打2 VIA hole)
MOATR2
MOATC2
Near Codec (各打2 VIA hole)
MOATR3
MOATC3
Near R_AUDIO(各打2 VIA hole)
MOATR4
MOATC4
Near AMP (各打2 VIA hole)
LINE-OUT
AJ_B5_R_R
AJ_B2_L_L
CR21
CR22
10/4
AJ_B5_R
AJ_B2_L
CBC23
CBC26
180p/4/NPO/50V/J
LINE-IN
LINE_IN_R
LINE_IN_L
CR5
CR13
62/4
AJ_A5_R
AJ_A2_L
CBC18
CBC27
MIC-IN
MIC1_R
MIC1_L
CR29
CR32
AJ_C5_R
AJ_C2_L
MIC1_VREFO_L
MIC1_VREFO_R
CBC19
CBC22
SURROUND
SURR_R
SURR_L
CEC5
CEC7
100u/FP/D/6.3V/65/C/13m
SURR_C_R CR46
SURR_C_L CR19
CR20
CR45
22K/4
BJ_C5_R
BJ_C2_L
CBC29
CBC28
CEN/LFE
LFE_R
CEN_L
CEC9
CEC10
LFE_C_R CR50
CEN_C_L CR41
CR42
CR51
BJ_B5_R
BJ_B2_L
CBC25
CBC34
Differential to Single-End AMPLIFIED
FRONT-R-
FRONT-R+
CEC14
CEC15
CR76
CR78
CR77
CR79
CBC82
CBC49
0.1u/4/X7R/16V/K
OP_INA-_R
OP_INA+_R
CU2A
NE5532PSR/SOP-PS/[10TA1-705532-11R]
AMP_R
CR128
CBC78
CBC50
FRONT-L-
FRONT-L+
CEC16
CEC17
CR93
CR95
CR96
CBC83
OP_INB-_L
OP_INB+_L
CU2B
AMP_L
CR129
CBC81
CBC51
CBC52
10u/8/X5R/16V/K
www.aitech1.ru
MUTE
CQ8
CQ9
CQ10
CQ11
2N7002/SOT23/25pF/5/[10IF1-2A7002-0CR]
AZALIA FRONT PANEL
CQ2
CQ1
BAT54A/SOT23/200mA
LINE2_VREFO
MIC2_VREFO
CR25
CR15
CR12
CR3
8.2K/4
EMI
MIC2_L
MIC2_R
FAUDIO_JD
CBC20
CBC15
10u/6X5R/6.3V/M
CR2
CR11
CR33
CR34
M2_L
M2_R
L2-R
L2-L
F_AUDIO
CR35
20K/4/1
CR31
39.2K/4/1
BH/2*5K8/BK/2.54/VA/AUDIO/PRT/TUR180
Digital Area
VCC3
CR56
8.2K/4/X
CR27
CR26
22K/4
CEC12
CEC13
LINE2_R
LINE2_L
L2_R
L2_L
CBC10
CBC16
CBC17
CBC6
180p/4/NPO/50V/J
AZALIA JACK
AUDIOB
AUDIOA
LINE1_JD
FRONT_JD
MIC1_JD
CEN_JD
SURR_JD
BLUE
LINE-IN
GREEN
LINE-OUT
PINK
MIC-IN
Orange
CEN/LFE
Black
SURROUND
SPDIF
FUSEVCC_R7_R8
OPTICAL
2X3RP/25P/OR,BK,BU,GR,RE/RA/[11NR6-403025-A1R]
Gigabyte Technology
Title
AUDIO JACK
Size
Custom
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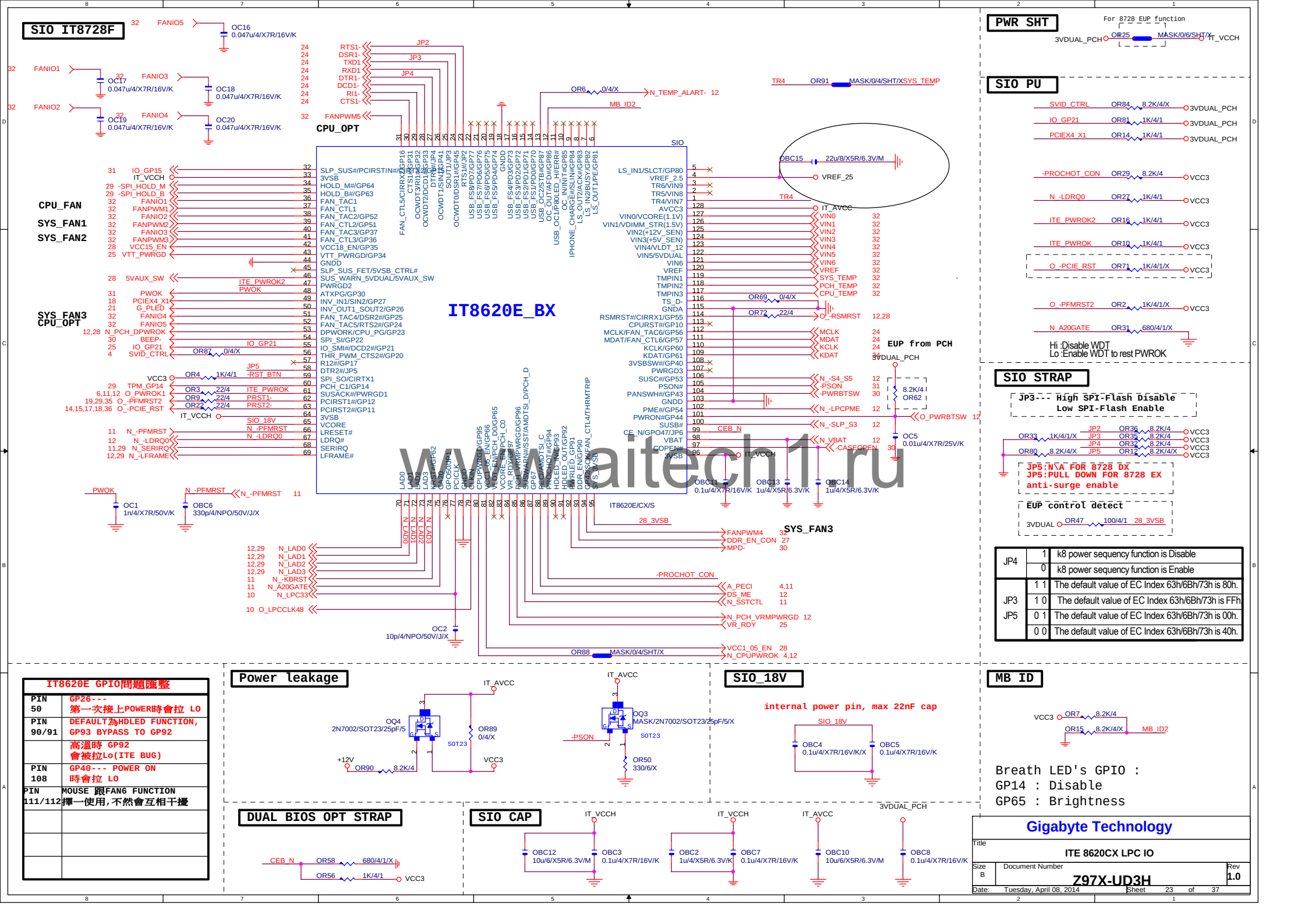
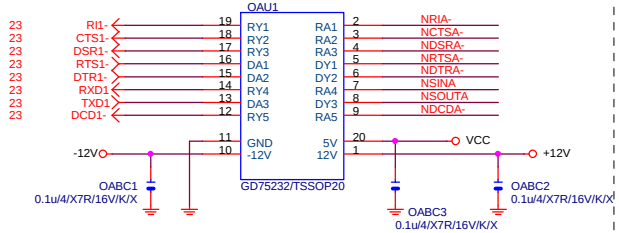
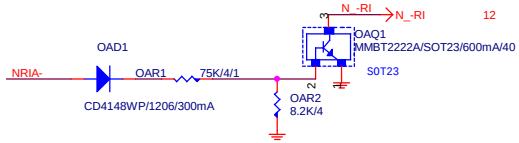
37


SIO IT8728F
IT8620E_BX
CPU_OPT
SIO
CPU_FAN
SYS_FAN1
SYS_FAN2
SYS_FAN3
CPU_OPT
SYS_FAN3
EUP from PCH
PWR SHT
SIO PU
SIO STRAP
SIO_18V
MB ID
Power leakage
DUAL BIOS OPT STRAP
SIO CAP
IT8620E GPIO問題匯整
Gigabyte Technology
ITE 8620CX LPC IO
Z97X-UD3H
Breath LED's GPIO :
GP14 : Disable
GP65 : Brightness
Hi :Disable WDT
Lo :Enable WDT to rest PWROK
internal power pin, max 22nF cap
JP3--- High SPI-Flash Disable
Low SPI-Flash Enable
JP5:N\A FOR 8728 DX
JP5:PULL DOWN FOR 8728 EX
anti-surge enable
EUP control detect
www.aitech1.ru

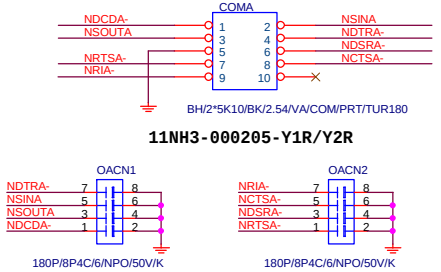
COMA



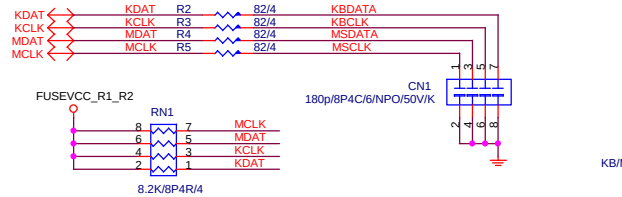
COM RI

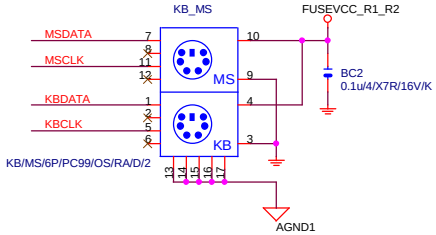


COM BUFFER

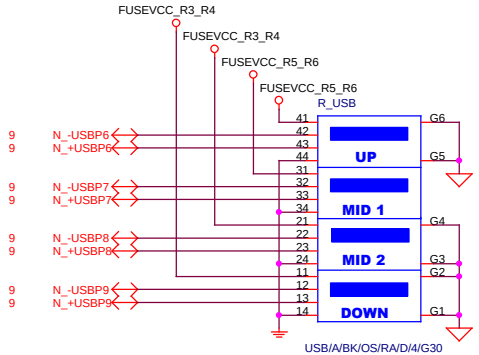


KB/USB

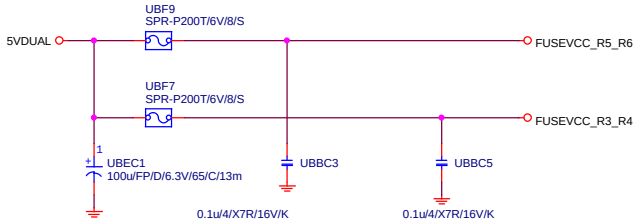




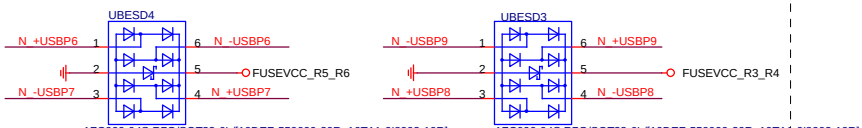
R_USB



USB20 FUSE



USB20 ESD PROCTECT



Gigabyte Technology		
Title: COM/ PROHOT/ R_USB		
Size: Custom	Document Number: Z97X-UD3H	Rev: 1.0
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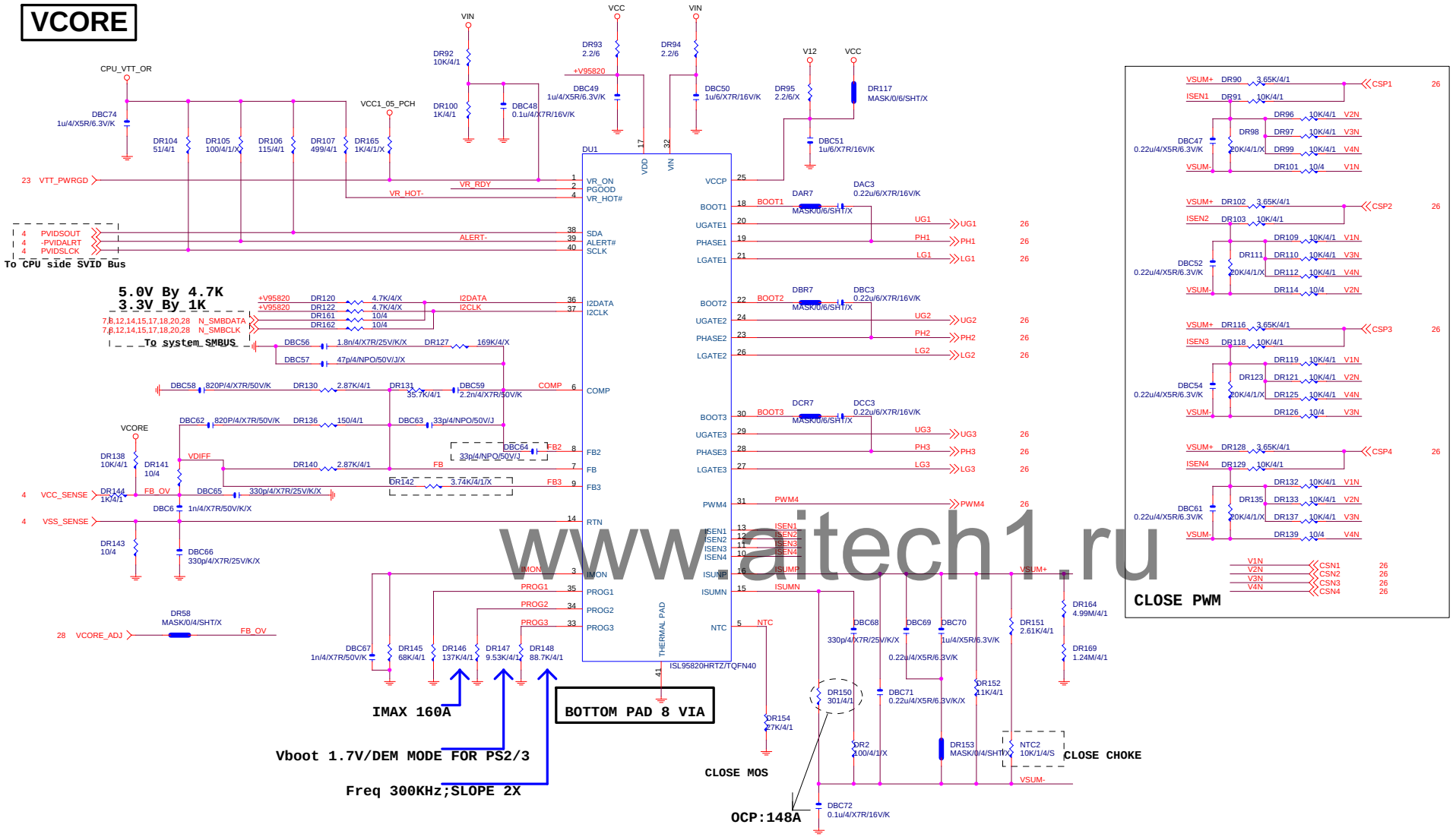
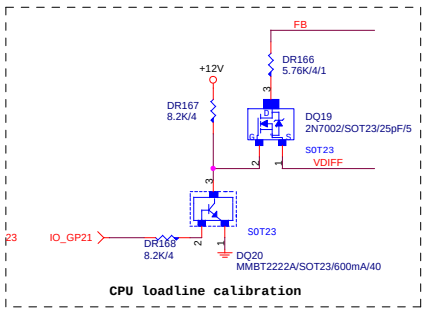
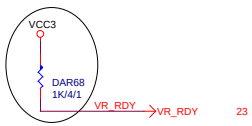
VCORE







VCORE各層切割

第一層:VCORE
第二層:VCORE
第三層:GND
第四層:VCORE

Gigabyte Technology		
Title: VCORE_ ISL95820		
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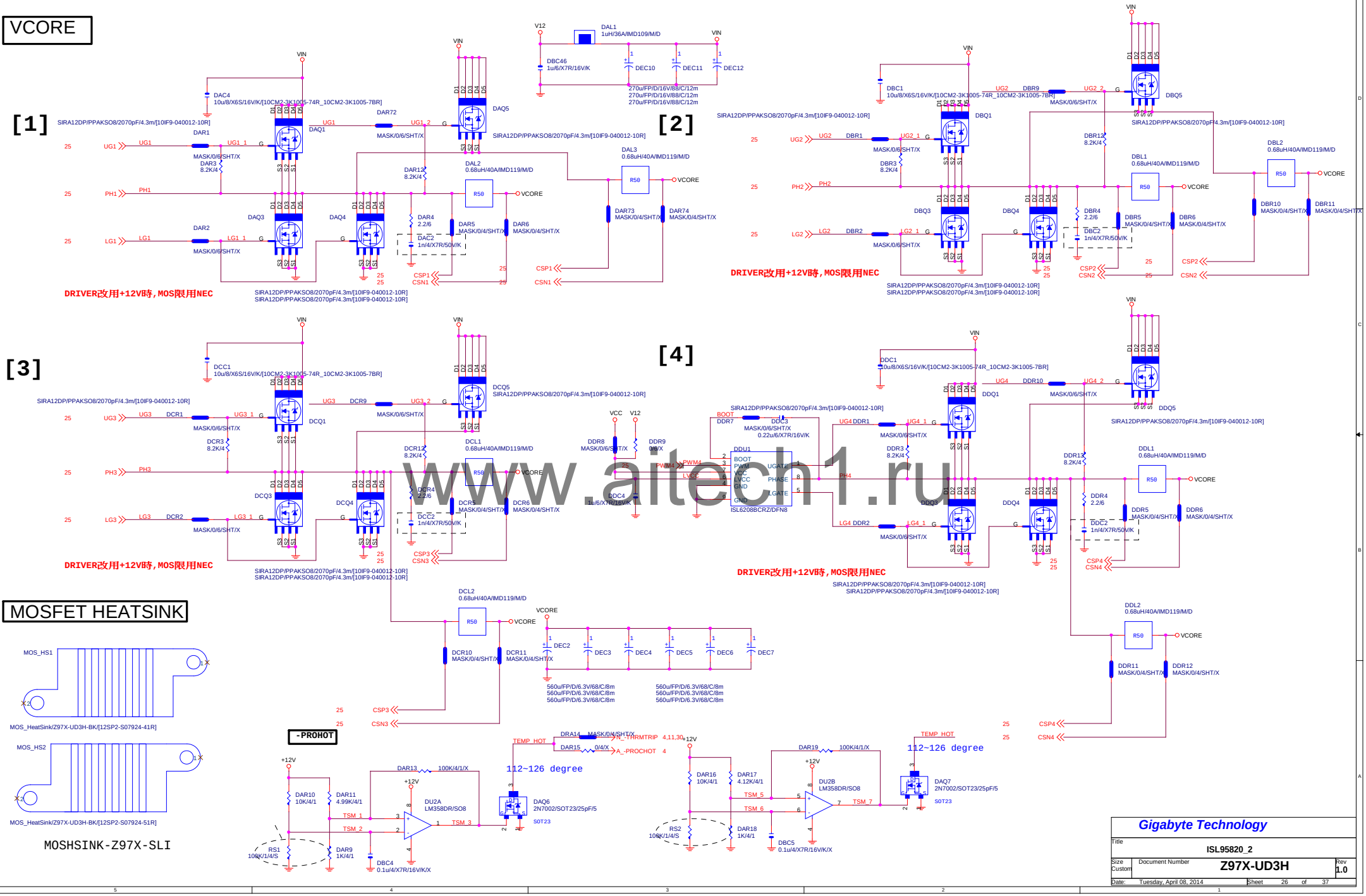
VCORE



MOSFET HEATSINK

MOSHSINK-Z97X-SLI

Gigabyte Technology		
Title	ISL95820_2	
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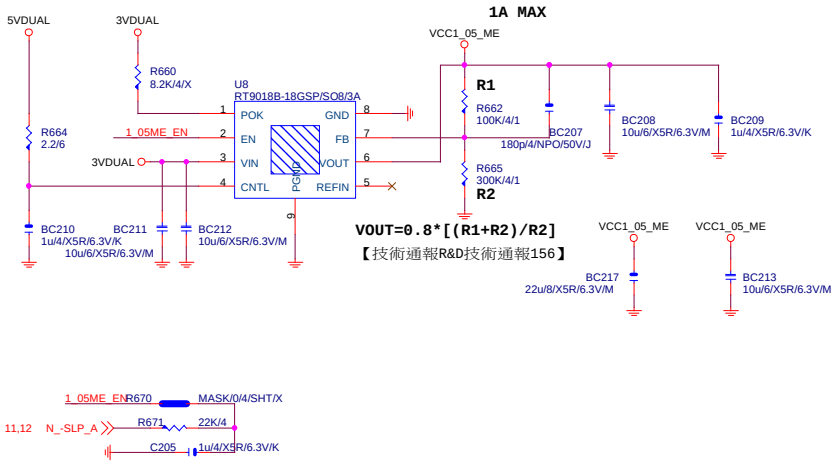
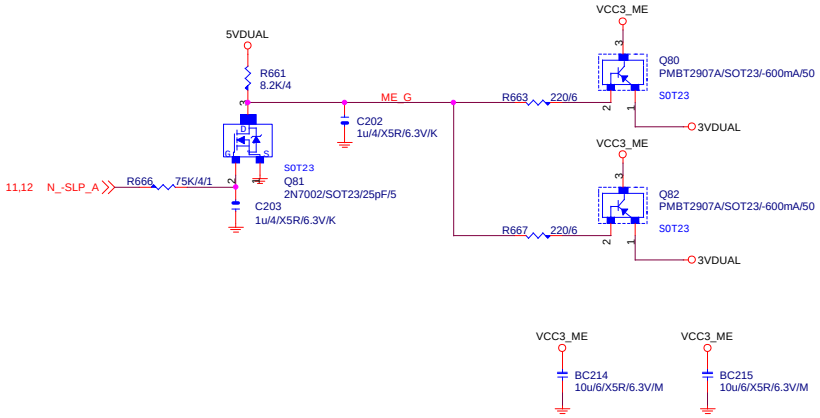
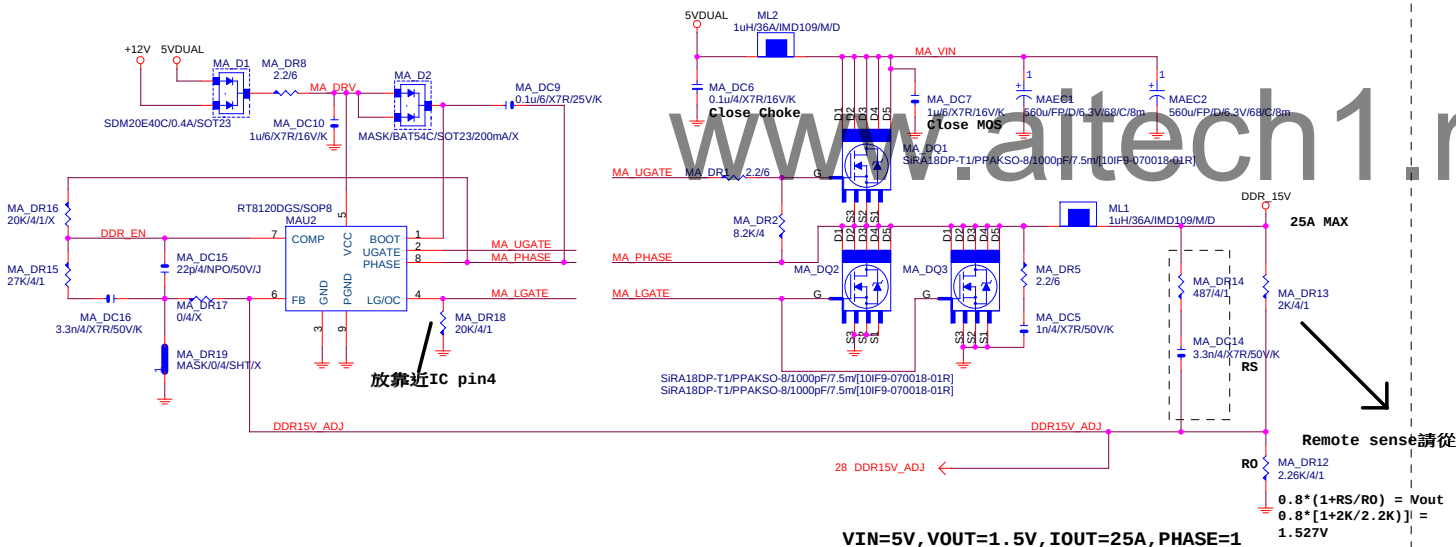
VCC1_05_ME



VCC3_ME



DDR_15V



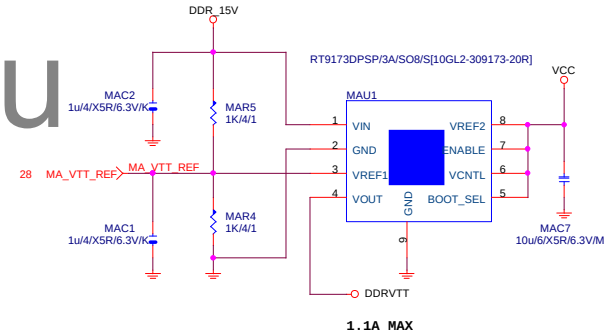
VIN=5V,VOUT=1.5V,IOUT=25A,PHASE=1
IRMS=11.45A

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

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

OCP:35.82A for Rds=6.7m for vishay@4.5V
OCP:72.727A for Rds=3.3m for renesas@10V
OCP:48A=Roset*Iocset / Rds(on)
=12K*10uA / [5//5]

DDRVTT



PWR SEQ

DDR_EN → DDR_EN_CON 23

GIGABYTE™

Title	DDR15V / M3 POWER	
Size: Custom	Document Number: Z97X-UD3H	Rev: 1.0
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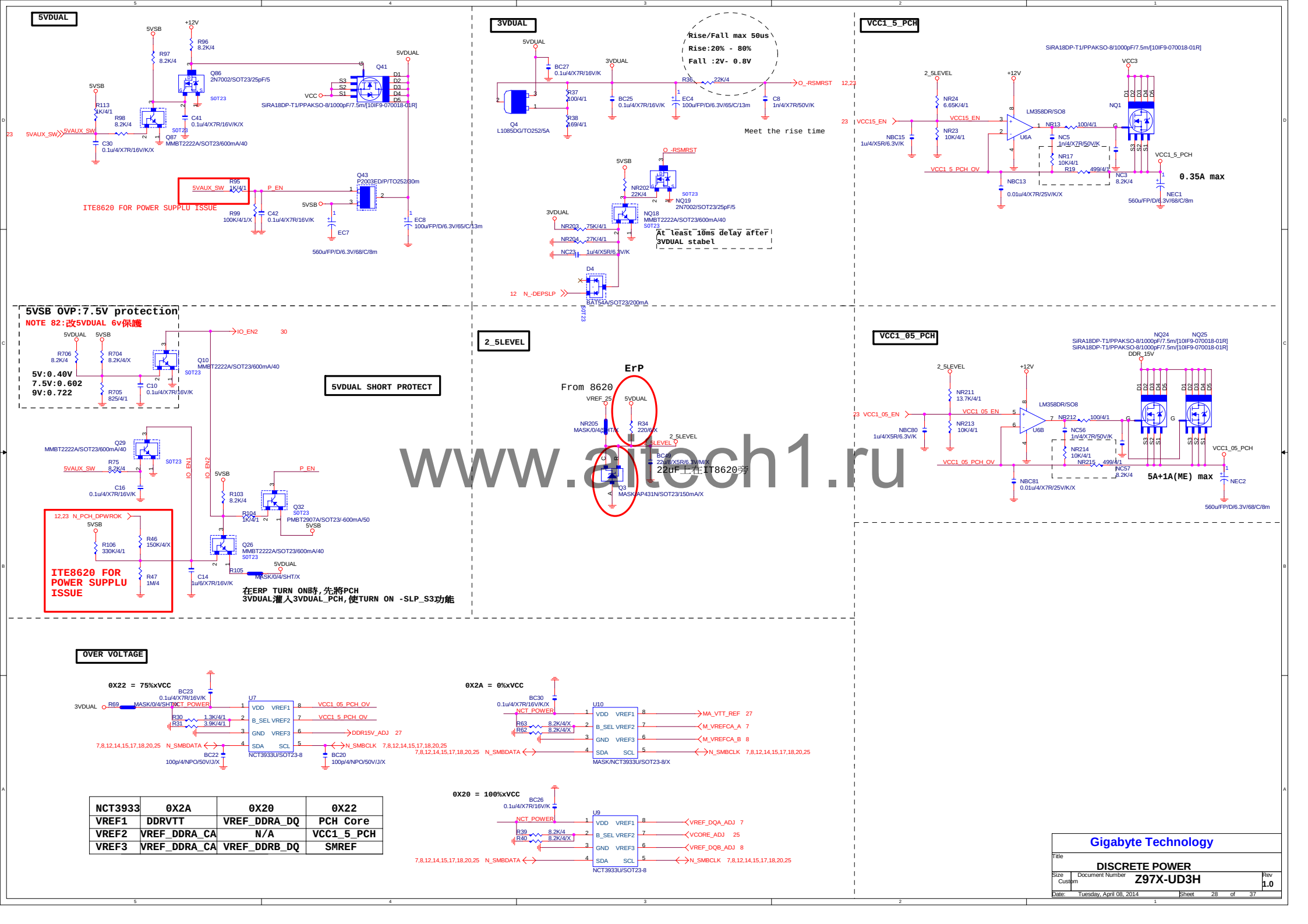

NCT3933	0X2A	0X20	0X22
VREF1	DDRVTT	VREF_DDRA_DQ	PCH Core
VREF2	VREF_DDRA_CA	N/A	VCC1_5_PCH
VREF3	VREF_DDRA_CA	VREF_DDRB_DQ	SMREF

Gigabyte Technology

Title: DISCRETE POWER

Size: Custom | Document Number: Z97X-UD3H | Rev: 1.0

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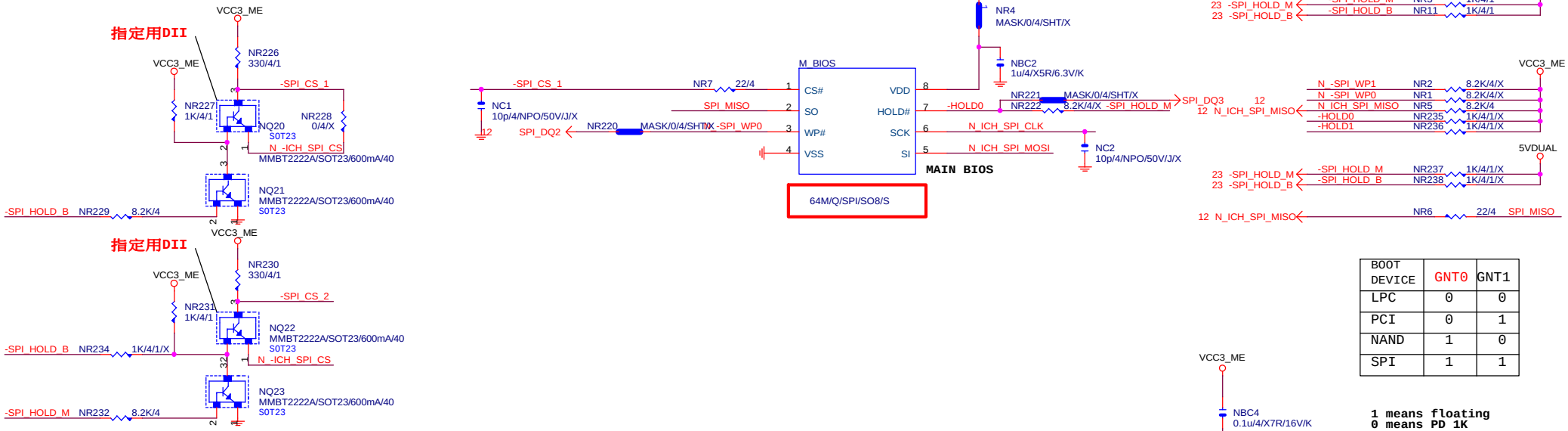
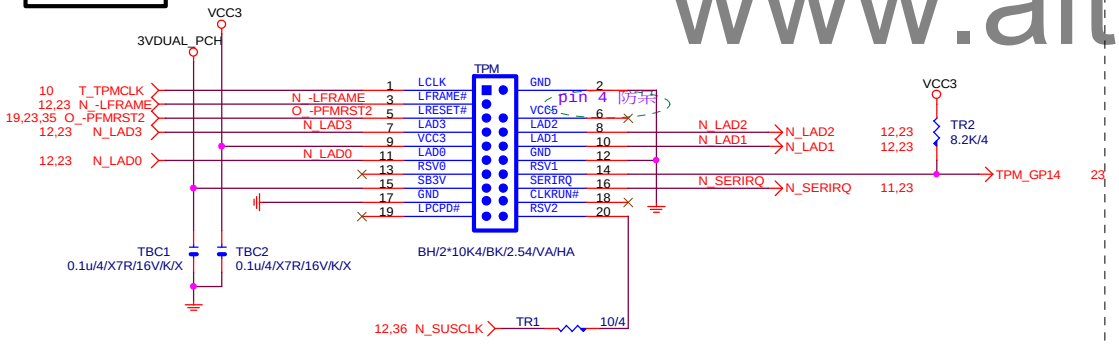
DUAL BIOS



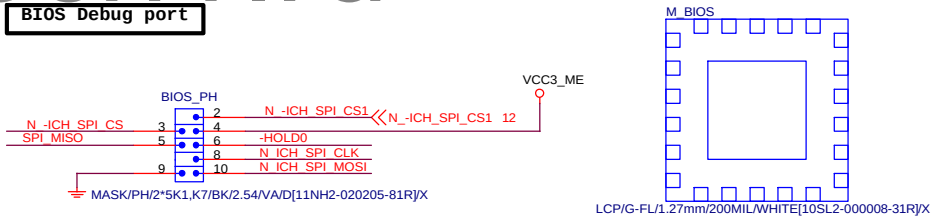
BOOT DEVICE	GNT0	GNT1
LPC	0	0
PCI	0	1
NAND	1	0
SPI	1	1

1 means floating
0 means PD 1K

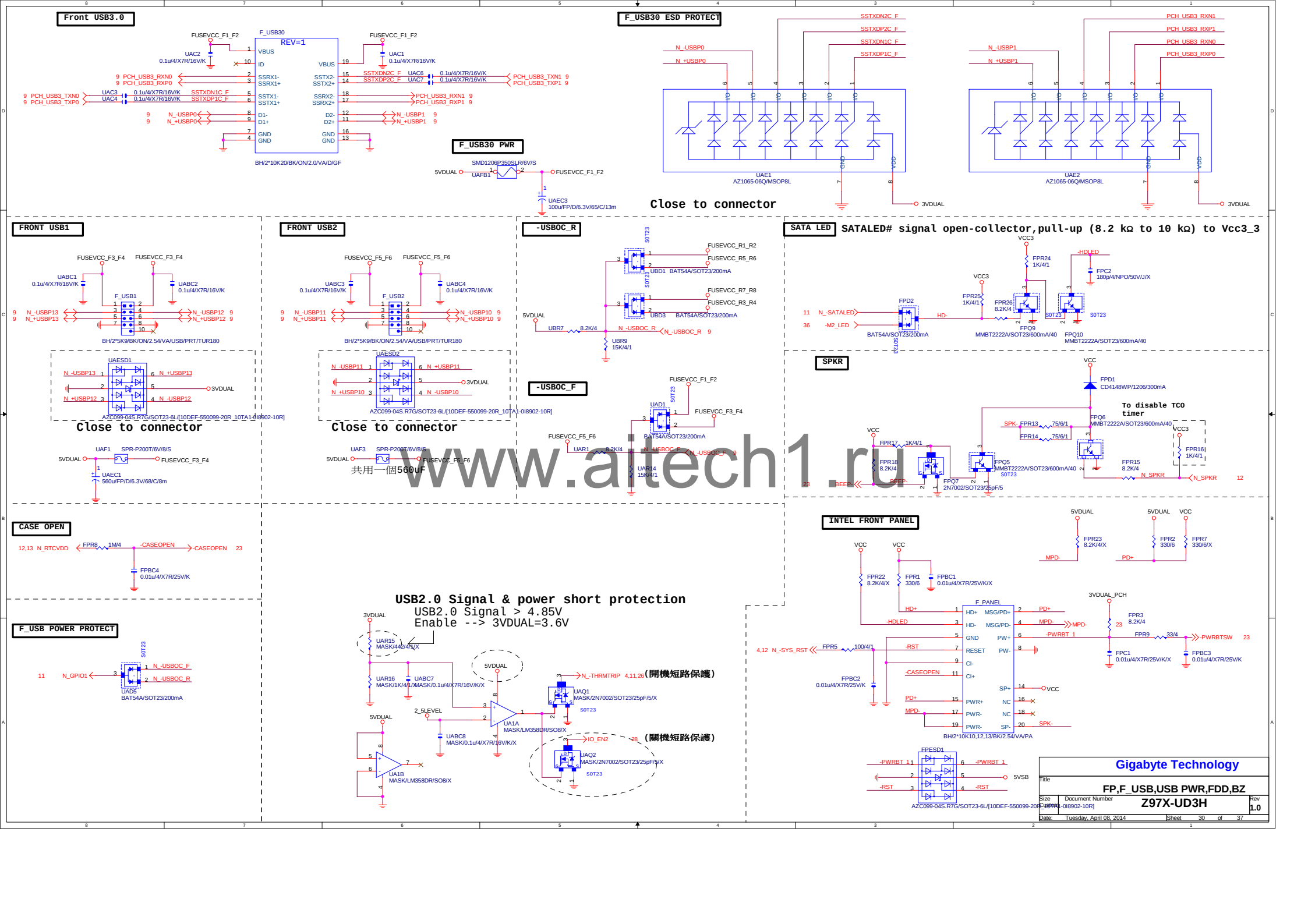
TPM CONNECT



BIOS Debug port

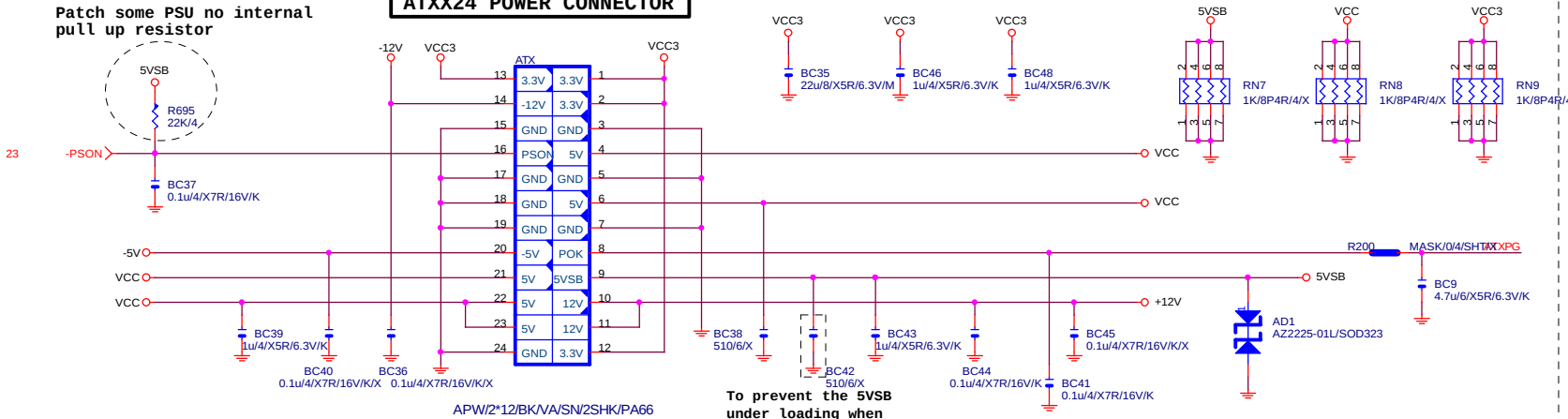


Gigabyte Technology		
Title: BIOS		
Size: Custom	Document Number: Z97X-UD3H	Rev: 1.0
Date: Tuesday, April 08, 2014	Sheet 29 of 37	



ATXX24 POWER CONNECTOR

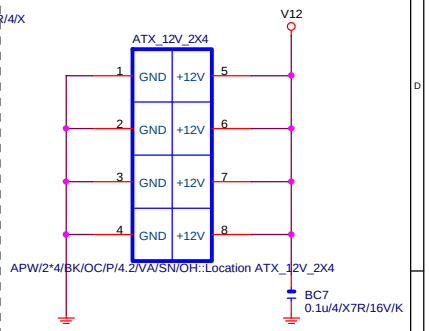
Patch some PSU no internal pull up resistor

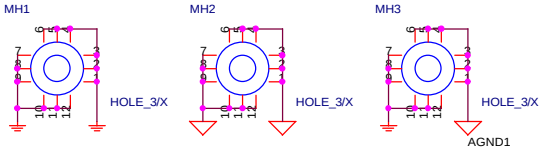


APW/2*12/BK/VA/SN/2SHK/PA66

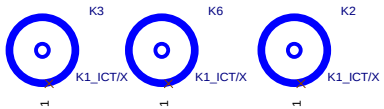
To prevent the 5VSB under loading when boot

ATXX4 POWER CONNECTOR

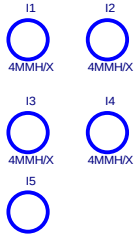




HOLE_4-RH-1



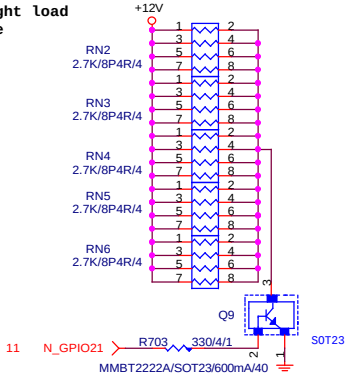
K1-ICT



4MMH

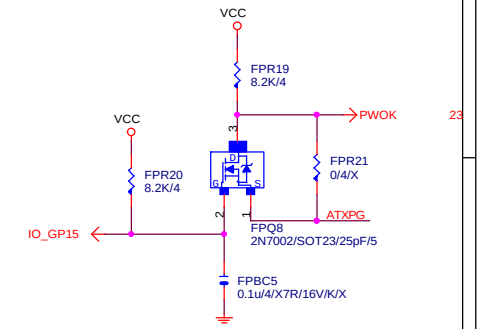
【技術通報R&D技術通報153】

To fix 12V light load abnromal issue



PWOK PATCH

【技術通報R&D技術通報154】



Gigabyte Technology		
Title: ATX POWER CONNECTOR		
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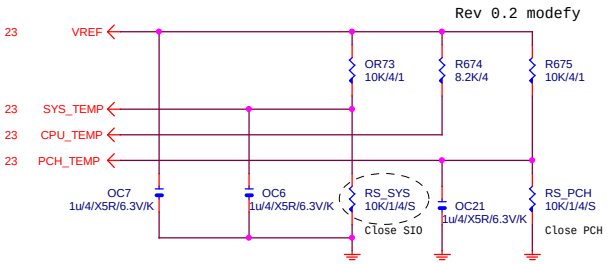
TEMP H/W MONITOR

Rev 0.2 modefy

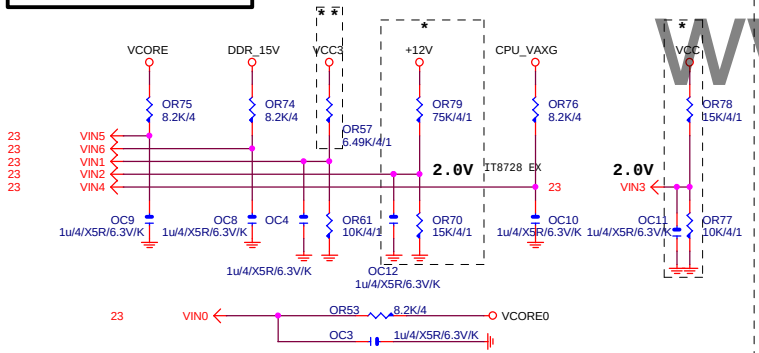


Thrmtrip#改用LM358做

VOLTAGE-- H/W MONITOR

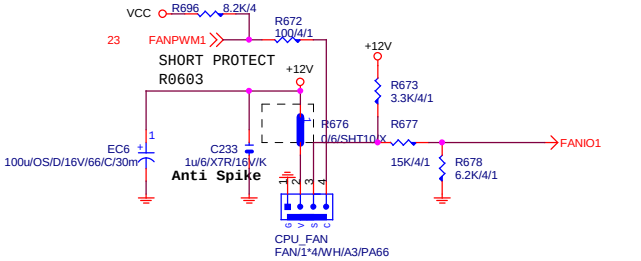
* IT8728 BX
** IT8728 CX

VIN2 must +12V input
VIN3 must VCC input



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

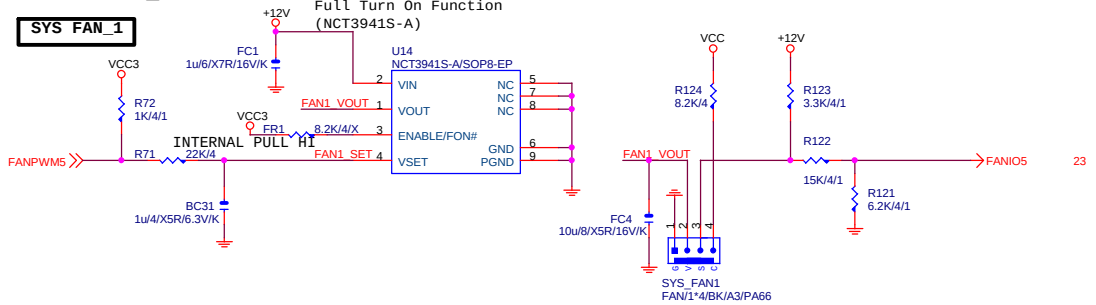
CPU SMART FAN



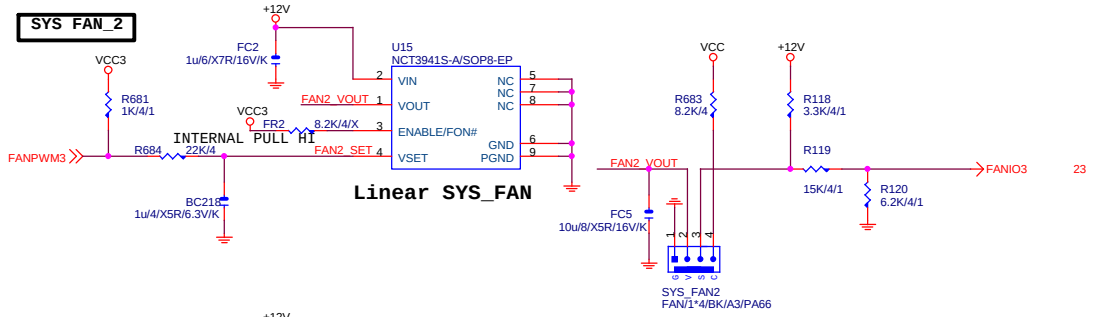
Linear SYS_FAN

Enable Function (NCT3941S)
Full Turn On Function (NCT3941S-A)

SYS FAN_1

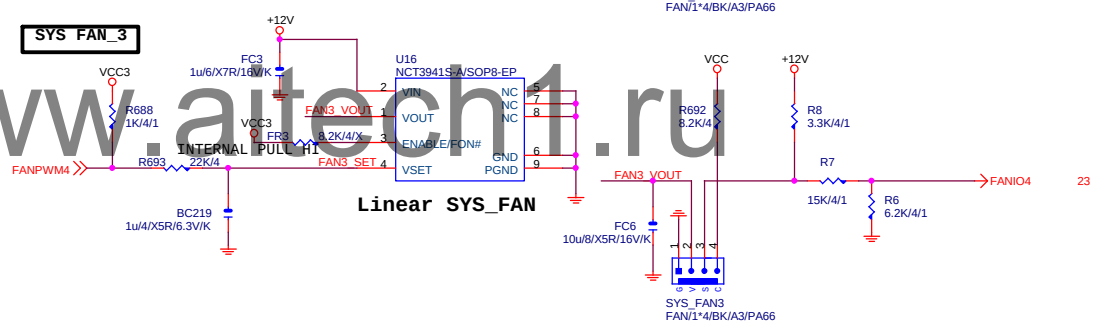


SYS FAN_2



Linear SYS_FAN

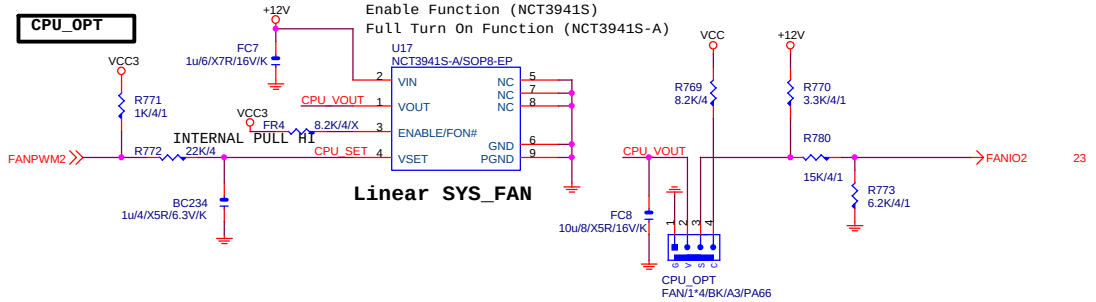
SYS FAN_3



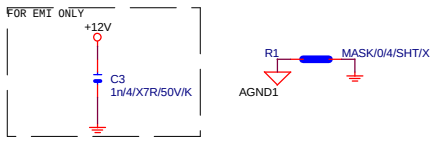
Linear SYS_FAN

CPU_OPT

Enable Function (NCT3941S)
Full Turn On Function (NCT3941S-A)



Linear SYS_FAN



Gigabyte Technology

Title	HWM,KB/MS, FAN CTRL	
Size: Custom	Document Number: Z97X-UD3H	Rev: 1.0
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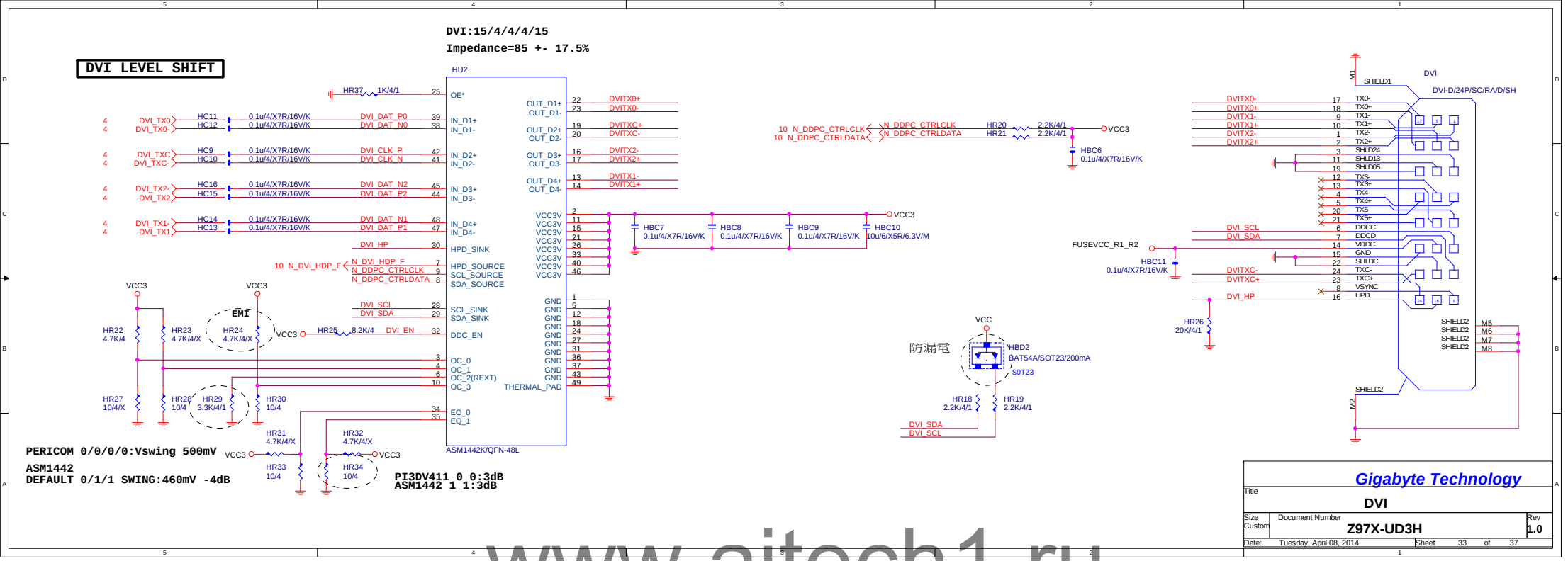
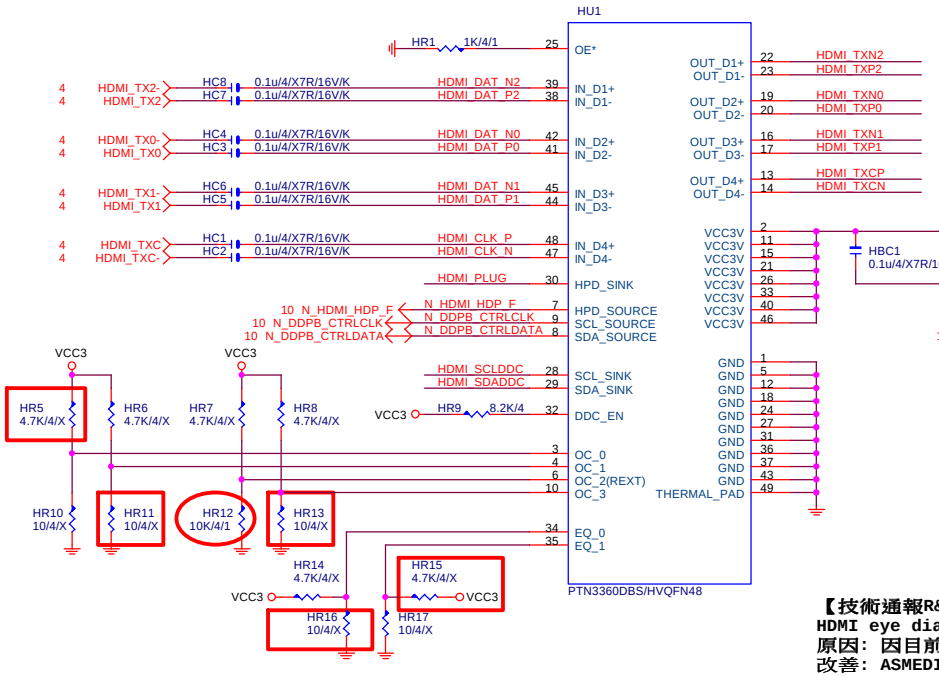
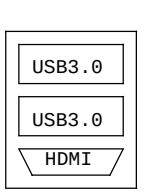
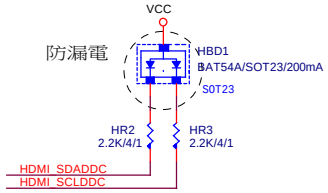


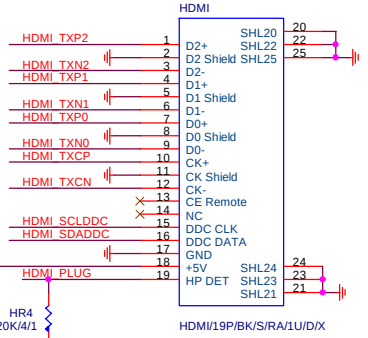
HDMI LEVEL SHIFT

HDMI:20/4/6/4/20
Impedance=85 +- 17.5%







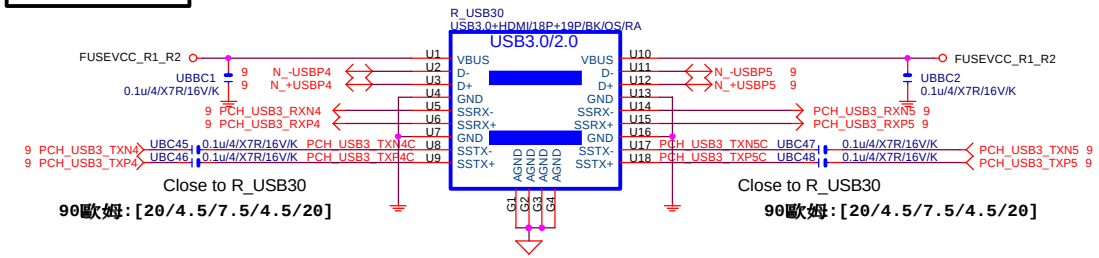


HDMI與R_USB共用一個料件

【技術通報R&D技術通報150】
HDMI eye diagram1.4版(deep color)會fail
原因: 因目前的HDMI訊號過長,造成RISING TIME過慢,而會壓到eye diagram
改善: ASMEDIA ASM1442 : 3.16K(PIN6 PULL DOWN電阻) 10ohm(PIN4 PULL DOWN電阻)

PTN3360:PIN 4/10/34/35 NC PIN,都不上值;只上HR12:10K
ASM1442:紅色框要上,HR12:3.16K

USB30_20 CONNECT



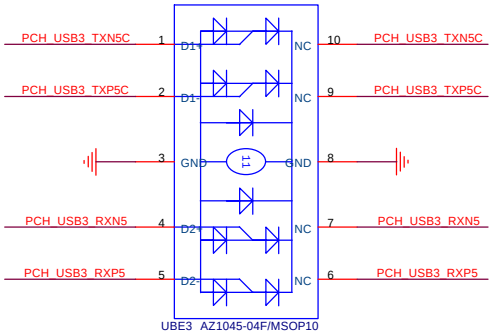
Close to R_USB30

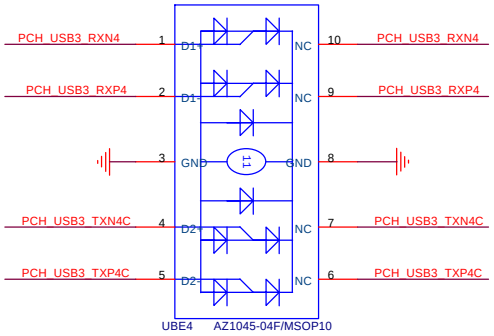
90歐姆:[20/4.5/7.5/4.5/20]

Close to R_USB30

90歐姆:[20/4.5/7.5/4.5/20]

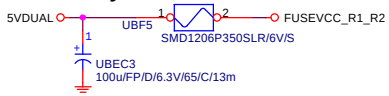
USB30 ESD PROCTECT



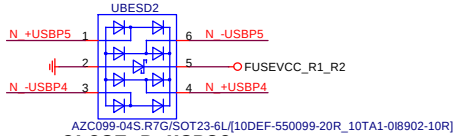


USB30 PWR

Polyswitch-1206



USB20 ESD PROCTECT



CLOSE R_USB30

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

GIGABYTE		
Title: HDMI		
Size: Custom	Document Number: Z97X-UD3H	Rev: 1.0
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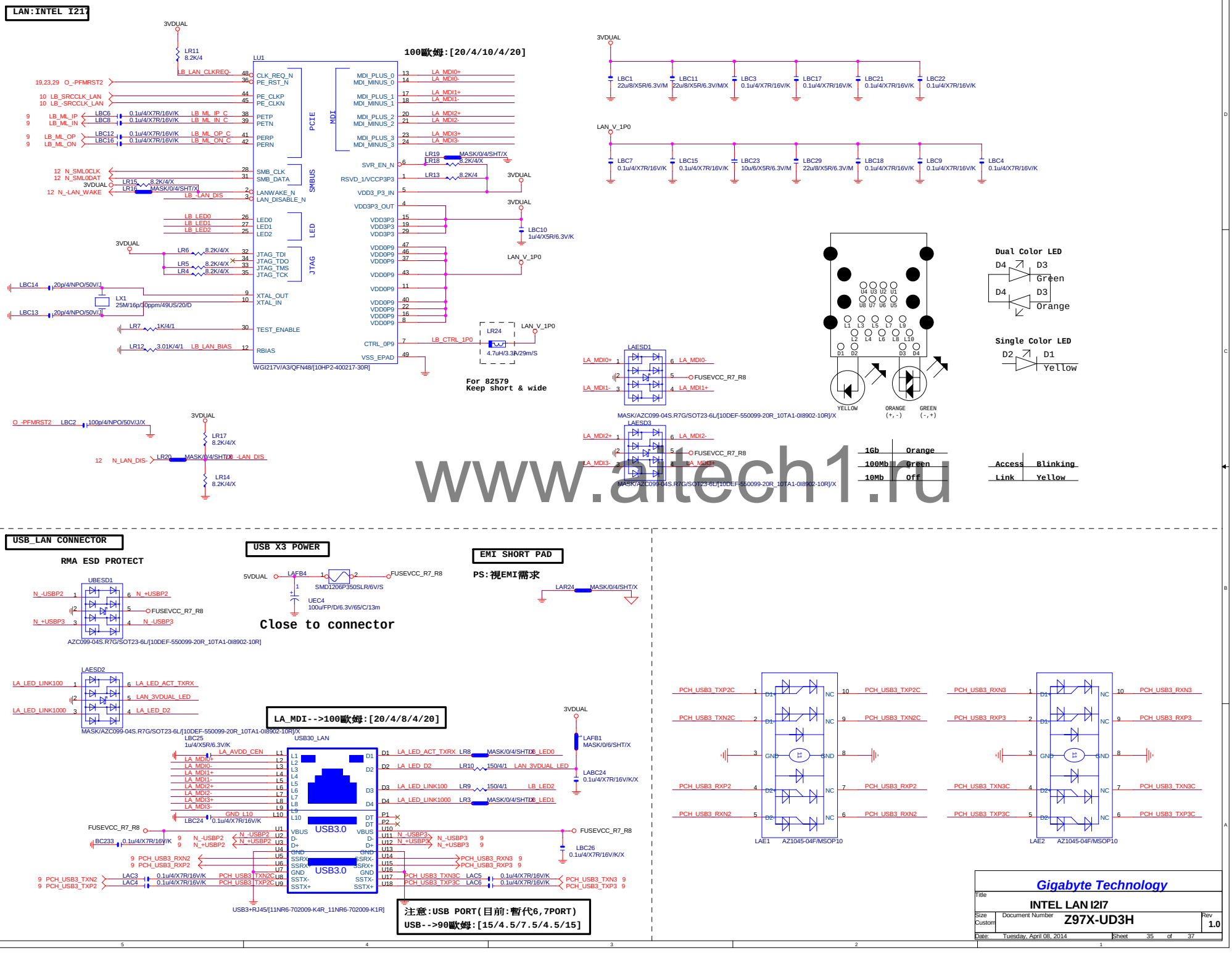
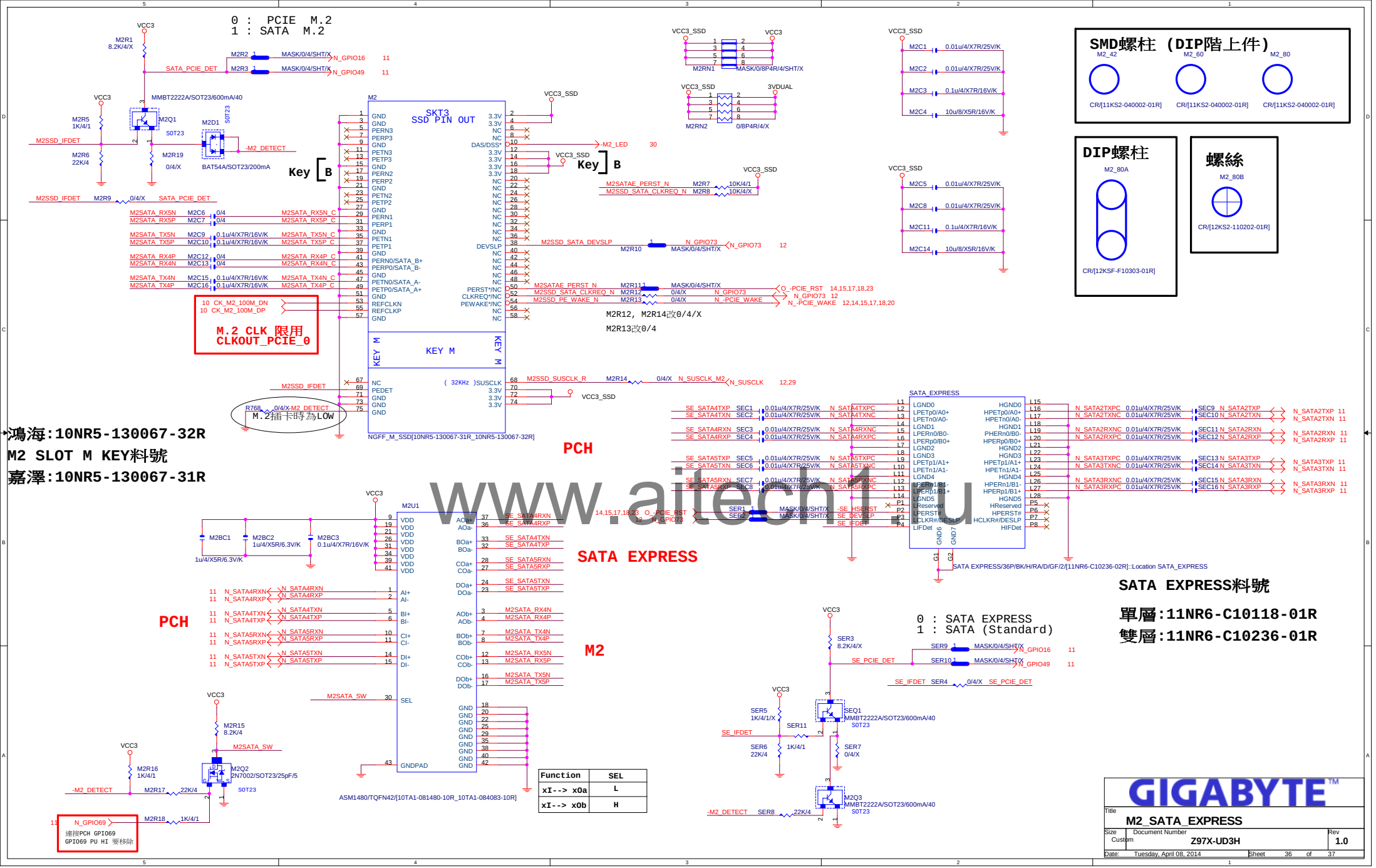




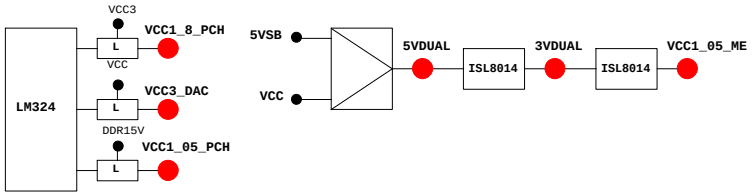
PCH GPIO LIST TABLE

PIN NAME	PWR	AFTER/PLTRST	Default	USAGE	NOTE
GP0	MAIN	H-Z	GPI	GPIO0	N/A
GP1/TACH1	MAIN		GPI	GPIO1	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	PCIEX1 Detect	P/U 8.2K VCC3
GP7/TACH3	MAIN		GPI	GPIO7	P/U 8.2K VCC3
GP8	STBY	H	GPI	GPIO8	N/A
GP9/OC5#	STBY		NATIVE	USB OC5#	N/A
GP10/OC6#	STBY		NATIVE	USB OC6#	N/A
GP11/SMBALERT#	STBY		NATIVE	USB PWR protect	P/U 8.2K 3VDUAL
GP12	STBY	L	GPI	GPIO12	N/A
GP13	STBY	L	GPI	LPCPME#	P/U 8.2K 3VDUAL
GP14/OC7#	STBY		NATIVE	USB OC7#	N/A
GP15	STBY	L	GPI	GPIO15(TLS Enable)	P/U 8.2K 3VDUAL
GP16	MAIN		GPI	GPIO16	P/U 8.2K VCC3
GP17/TACH0	MAIN		GPI	GPIO17	P/U 8.2K VCC3
GP18	MAIN		GPI	Mobile Only	N/A
GP19	MAIN		GPI	GPIO19	P/U 8.2K VCC3
GP20	MAIN		GPI	GPIO20	P/U 8.2K VCC3
GP21	MAIN		GPI	GPIO21	P/U 8.2K VCC3
GP22	MAIN	H-Z	GPI	GPIO22	P/U 8.2K VCC3
GP23	MAIN		GPI	GPIO23	N/A
GP24	STBY	L	GPI	SKTOCC#	N/A
GP25	STBY			Mobile Only	N/A
GP26	STBY			Mobile Only	N/A
GP27	STBY	H	GPO	GPIO27	P/U 8.2K 3VDUAL
GP28	STBY	H	GPO	PWR LED	P/U 8.2K 3VDUAL
GP29	STBY	L	GPI	GPIO29	N/A
GP30	STBY	H-Z	GPI	Mobile Only	N/A
GP31	STBY	H-Z	GPI	Mobile Only	N/A
GP32	MAIN	H	GPO	N/A	N/A
GP33	MAIN	H	GPO	N/A	N/A
GP34	MAIN	H-Z	GPI	-PCI_STOP	P/U 8.2K VCC3
GP35	MAIN	L	GPO	-ACZ_DET	P/U 8.2K VCC3
GP36	MAIN		GPI	N/A	N/A
GP37	MAIN		GPI	N/A	N/A
GP38	MAIN	H-Z	GPI	PCIEX4 Detect	P/U 8.2K VCC3
GP39	MAIN	H-Z	GPI	GPIO39	P/U 8.2K VCC3
GP40	STBY		NATIVE	USB OC1#	N/A
GP41	STBY		NATIVE	USB OC2#	N/A
GP42	STBY		NATIVE	USB OC3#	N/A
GP43	STBY		NATIVE	USB OC4#	N/A
GP44	STBY	L	NATIVE	GPIO44	P/U 8.2K 3VDUAL
GP45	STBY		NATIVE	GPIO45	P/U 8.2K 3VDUAL
GP46	STBY	L	NATIVE	GPIO46	P/U 8.2K 3VDUAL
GP47	STBY			Mobile Only	N/A
GP48	MAIN	H-Z	IN	GPIO48	P/U 8.2K 3VDUAL
GP49	MAIN	H-Z	IN	GPIO49	P/U 8.2K 3VDUAL
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	Mobile Only	N/A
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			Mobile Only	N/A
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

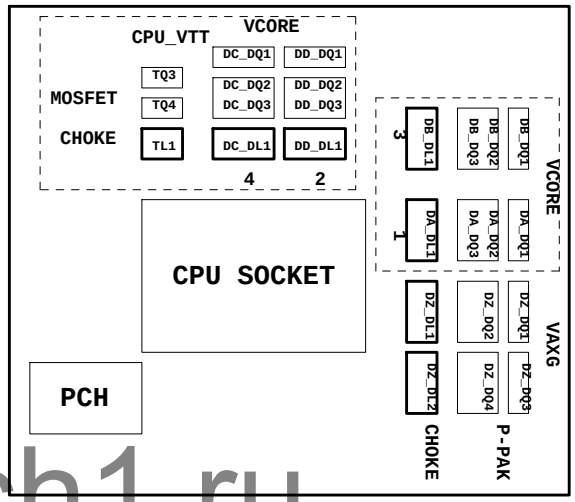
Super I/O ITE8720 GPIO Table

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	-PEMRST1	
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：

Z77-D3H :
PCH :
12SP2-S05511-01R/02R/03R
MOSFET :
12SP2-S08924-01R/02R/03R

	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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