Model Name: GA-Q57M-S2H

SHEET	TITLE
01	COVER SHEET
02	BOM & PCB MODIFY HISTORY
03	BLOCK DIAGRAM
04	CPU_LGA1156-A
05	CPU_LGA1156-B
06	CPU_LGA1156-C
07	DDR III CHANNEL A
08	DDR III CHANNEL B
09	DDR III POWER CAP
10	PCH_FDI,DMI,USB,PCIE
11	PCH_DP,CLK BUFFER
12	PCH_HOST,SATA,PCI
13	PCH_GPIO,CTRL,AUDIO
14	PCH_PWR,GND
15	PCI EXPRESS*16 SLOT
16	PCI EXPRESS*4 SLOT
17	PCI SLOT 1,2
18	ITE 8720 LPC IO
19	Dual BIOS,PHOT,D-OC ,RUSB
20	ALC888B/889A
21	REAR AUDIO JACK
22	CLOCK GEN RTM885N-914
23	DISCRETE POWER
24	DDR_15V,PWR SEQ
25	CPU_VAXG PWM_ISL6314CRZ
26	CPU_VTT PWM_ISL6322G
27	ME POWER

SHEET	TITLE
28	VCORE PWM_ISL6334CR
29	F_PANEL , F_USB , FDD
30	COM A/B , LPT
31	ATX POWER,TPM
32	INTEL 1Gb LAN
33	JMB368
34	HDMI,DVI,DP,VGA
35	HWM,KB/MS , FAN CTRL ,80 PORT

Gigabyte Technology

Title: Cover Sheet

Size: Custom | Document Number: GA-Q57M-S2H | Rev: 1.02

Date: Thursday, March 04, 2010 | Sheet 1 of 35

Model Name: GA-Q57M-S2H

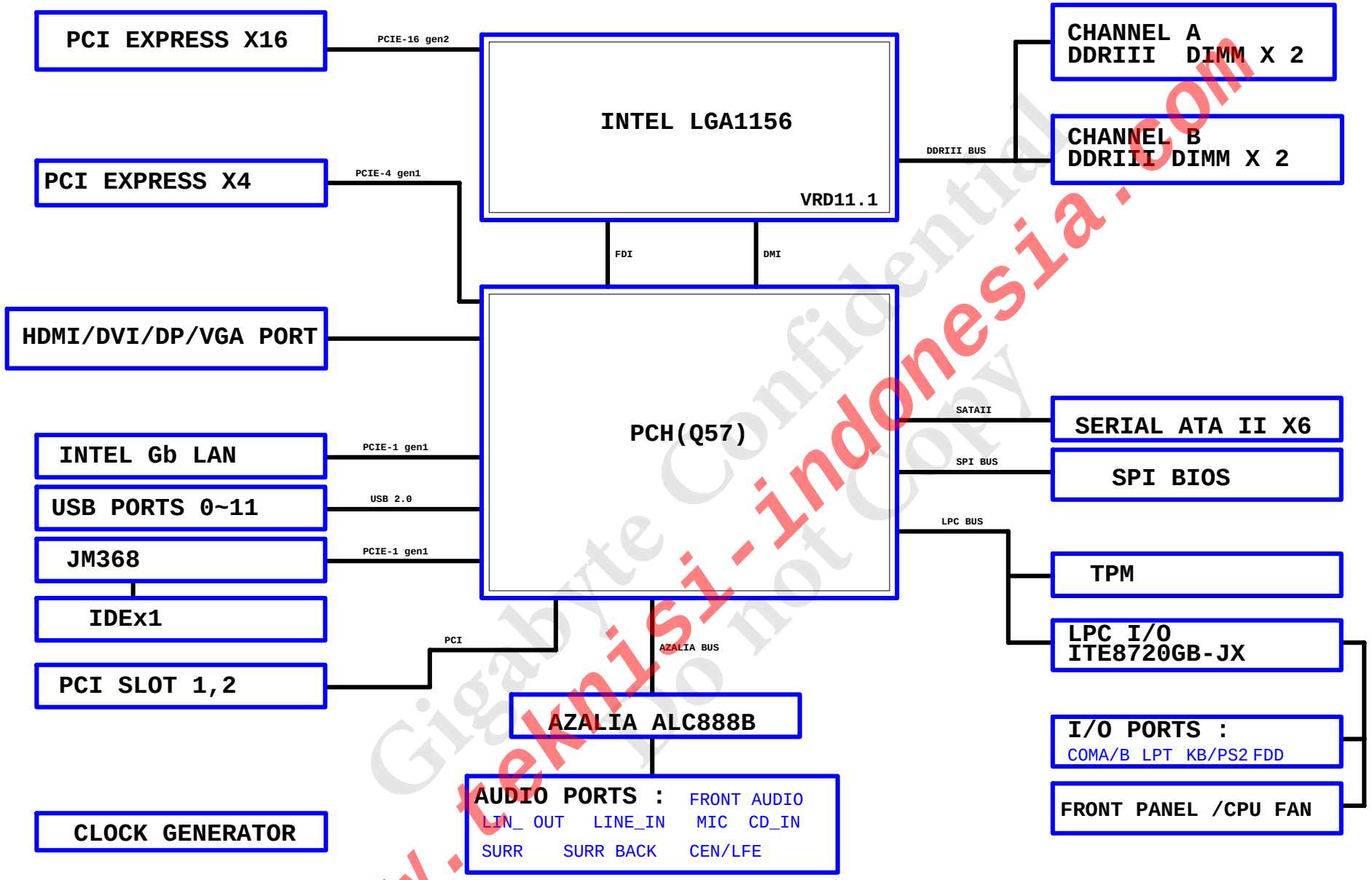
Component value change history

Data	Change Item	Reason
2009/12/21	10A BOM ready for DVT	
2010/02/11	10B BOM ready	Add PCIE +12V protect circuit
2010/3/01	10C BOM ready	Add PCI CI- function circuit for ME

Circuit or PCB layout change for next version

DATE	Change Item	Reason
2009/11/10	0.1 Layout ready	
2009/12/08	0.2 Layout ready	
2009/12/21	1.0 Layout ready	
2010/2/11	1.01 Layout ready	
2010/3/01	1.02 Layout ready	

BLOCK DIAGRAM



Gigabyte Technology			
Title: BLOCK DIAGRAM			
Size: C	Document Number: GA-Q57M-S2H		Rev: 1.02
Date: Thursday, March 04, 2010	Sheet 3 of 35		

FDI : 16/5/5/5/16(breakout min 8/4/5/4/8)
Impedance=80 +- 17.5%

PCIEX16:16/5/5/5/16(breakout min 8/4/5/4/8)
Impedance=80 +- 17.5%

DMI:12/5/5/5/12
Impedance=80 +- 17.5%

CFG0=1: 1X16 PEG
CFG0=0: 2X8 PEG

For PCIE2.0 issue
Must remove after
fixed issue

CFG 0-5 all internal PULL-UP

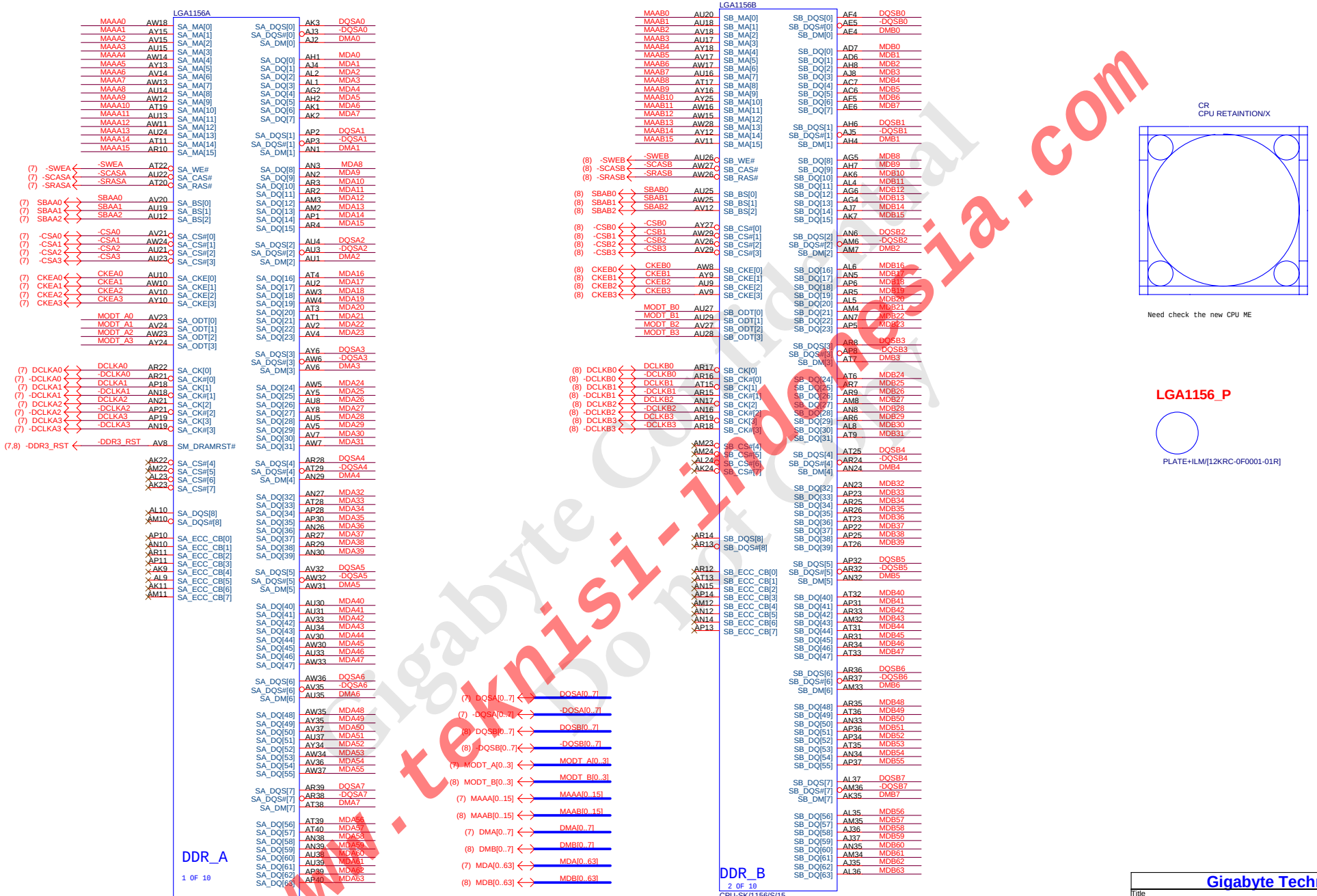
CFG	H	L	NOTE
0			H:1X16 , L:2X8
1	RSVD		
2	RSVD		
3	NORM	RSVD	LANE REVERSAL
4	DISABLE	ENABLE	DP PRESENCE
5	RSVD		
6	RSVD		
7	RSVD		ENGINEERING EXPERIMENT
15	RSVD		ENGINEERING EXPERIMENT

	FUNCTION	DEFAULT
VID0	MSI0	0
VID1	MSI1	1
VID2	MSI2	1
VID3	IMON CFG0	1
VID4	IMON CFG1	1
VID5	IMON CFG2	1
VID6	RSVD	0
VID7	VRD SEL	0
PSI#	RSVD	

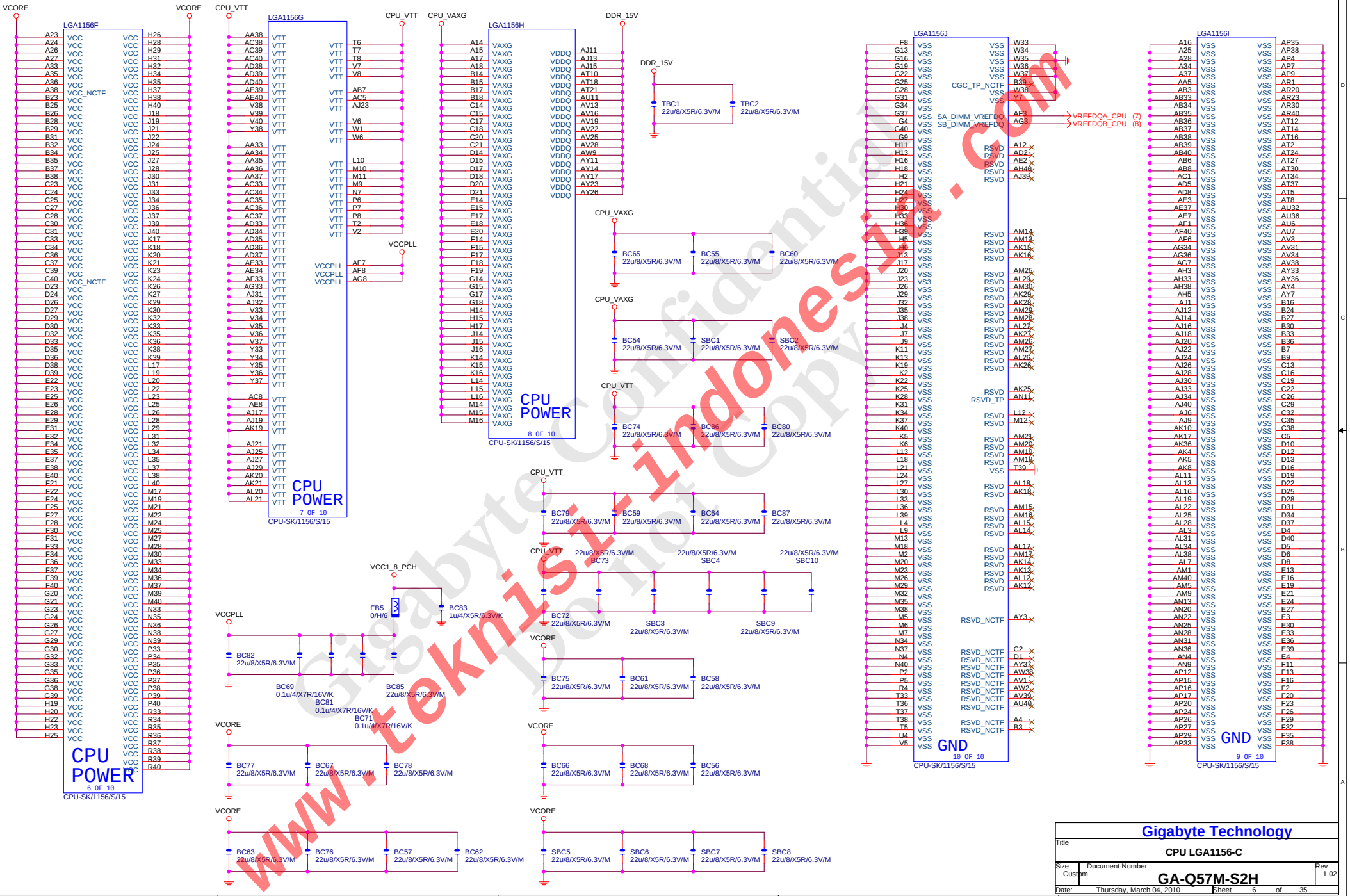
POWER ON CONFIG TABLE (Default=1.2250V)

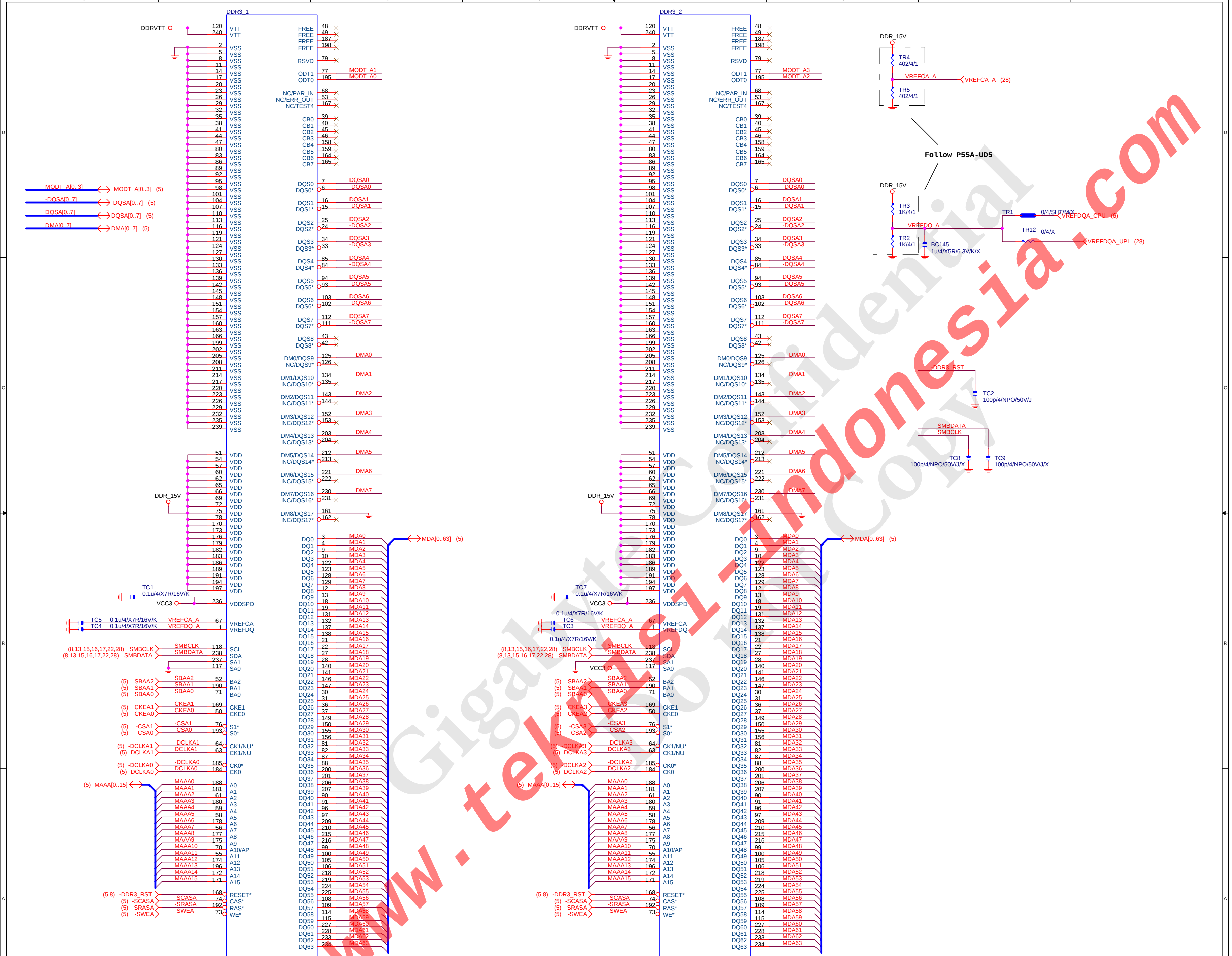
Check Trace length/ width

Gigabyte Technology
Title: CPU LGA1156-A
Size: Custom | Document Number: GA-Q57M-S2H | Rev: 1.02
Date: Thursday, March 04, 2010 | Sheet 4 of 35



Gigabyte Technology			
Title: CPU LGA1156-B			
Size: Custom	Document Number: GA-Q57M-S2H		Rev: 1.02
Date: Thursday, March 04, 2010	Sheet 5 of 35		



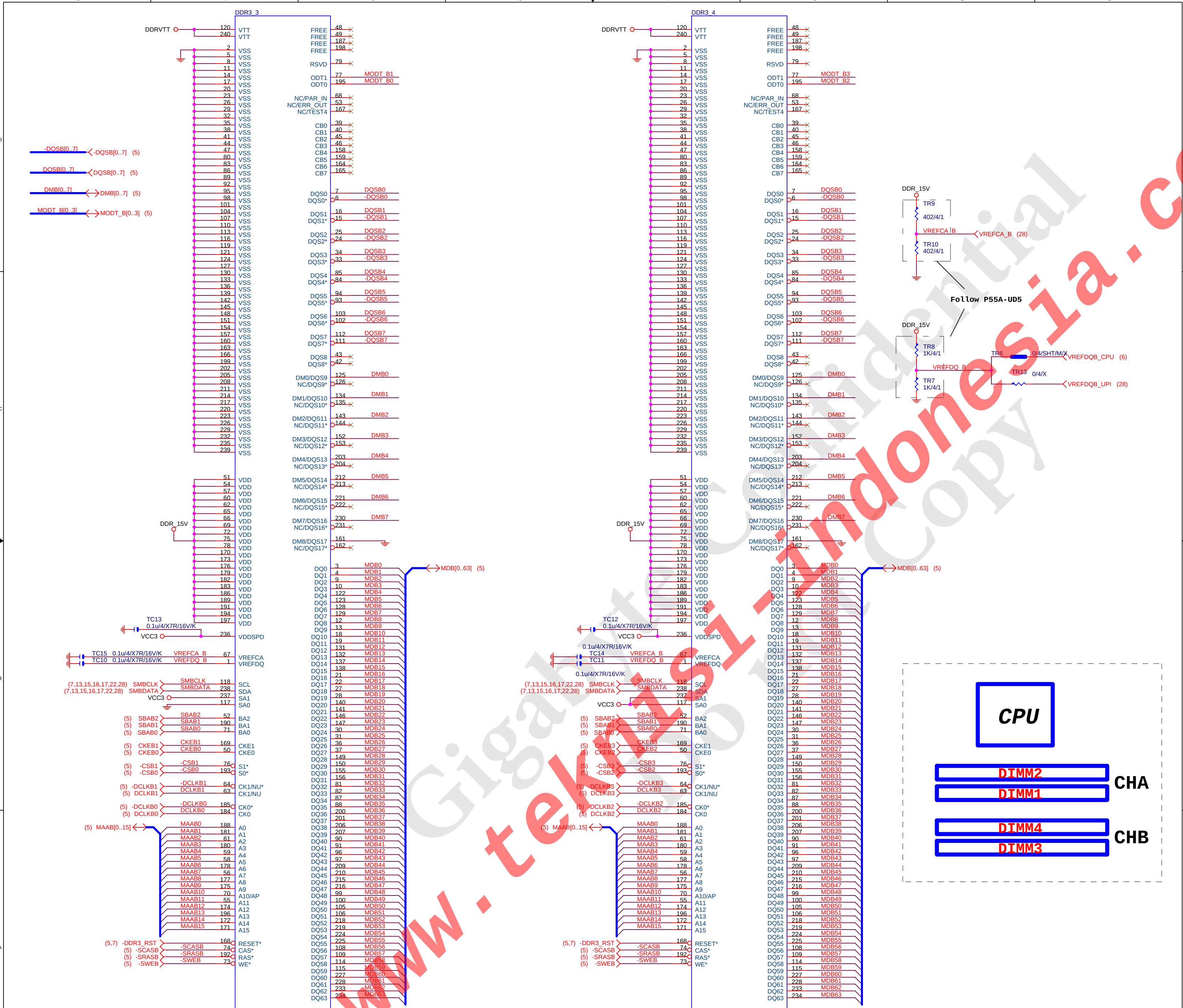


Gigabyte Technology

Title: DDRIII CHANNEL A

Size: Custom | Document Number: GA-Q57M-S2H | Rev: 1.02

Date: | Sheet 7 of 35



Gigabyte Technology

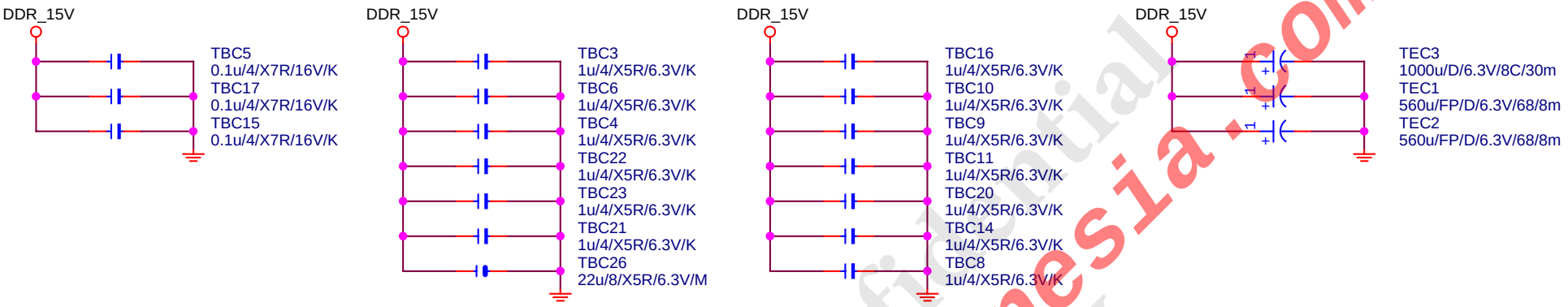
Title: DDRIII CHANNEL B

Size	Document Number	Rev
Custom	GA-Q57M-S2H	1.02

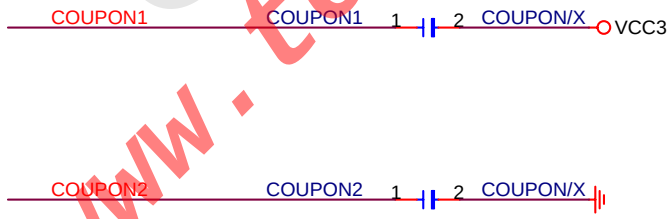
Date: Sheet 8 of 35

DDR TERMINATION CHANNEL A/B

DDR15V Decouple



DDRVTT Decouple



Gigabyte Technology		
Title: DDRIII POWER CAP		
Size: A	Document Number: GA-Q57M-S2H	Rev: 1.02
Date: Thursday, March 04, 2010	Sheet 9 of 35	

DMI:12/5/5/5/12
Impedance=80 +- 17.5%

Impedance=80 +- 17.5%
PCIE X1 :15/5/5/5/15

PCIEX4
JMB368
LAN

電容要靠近 slot 端

PCH_HS

PCH_HS[12SP2-030030-C1R]

PCHB

Q57/B3[10HB1-030Q57-10R]

USB:15/4.5/7.5/4.5/15
Impedance=90+- 15%

H55-->PORT6,7:N/A

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

USB OC#	Configure
OC0#	USB0,1(F_USB1)
OC1#	USB2,3(F_USB2)
OC2#	USB4,5(F_USB3)
OC3#	USB6,7(F-USB4)H55-->N/A
OC4#	USB8,9(USB_LAN)
OC5#	USB10~11(USB_1394_ESATA)
OC6#	USB12~13(KB_USB)
OC7#	GPIO14

NV_ALE	
Hi	Enable Danbury
Lo	Disable Danbury

Intel anti theft techonlogy

PCHE

NVRAM

Q57/B3[10HB1-030Q57-10R]

Impedance=50+- 15%
ONFI: NV_DQ 4/5
NV_DQS 4/10
NV_CTRL 4/10
NV_CK 4/15

DMI Terminator voltage
HI : AC COUP : TX/RX TO VCC
LO : DC COUP : HALF SWING

Title	PCH FDI,DMI,USB ,PCIE
Size	B
Document Number	GA-Q57M-S2H
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Date:	Thursday, March 04, 2010
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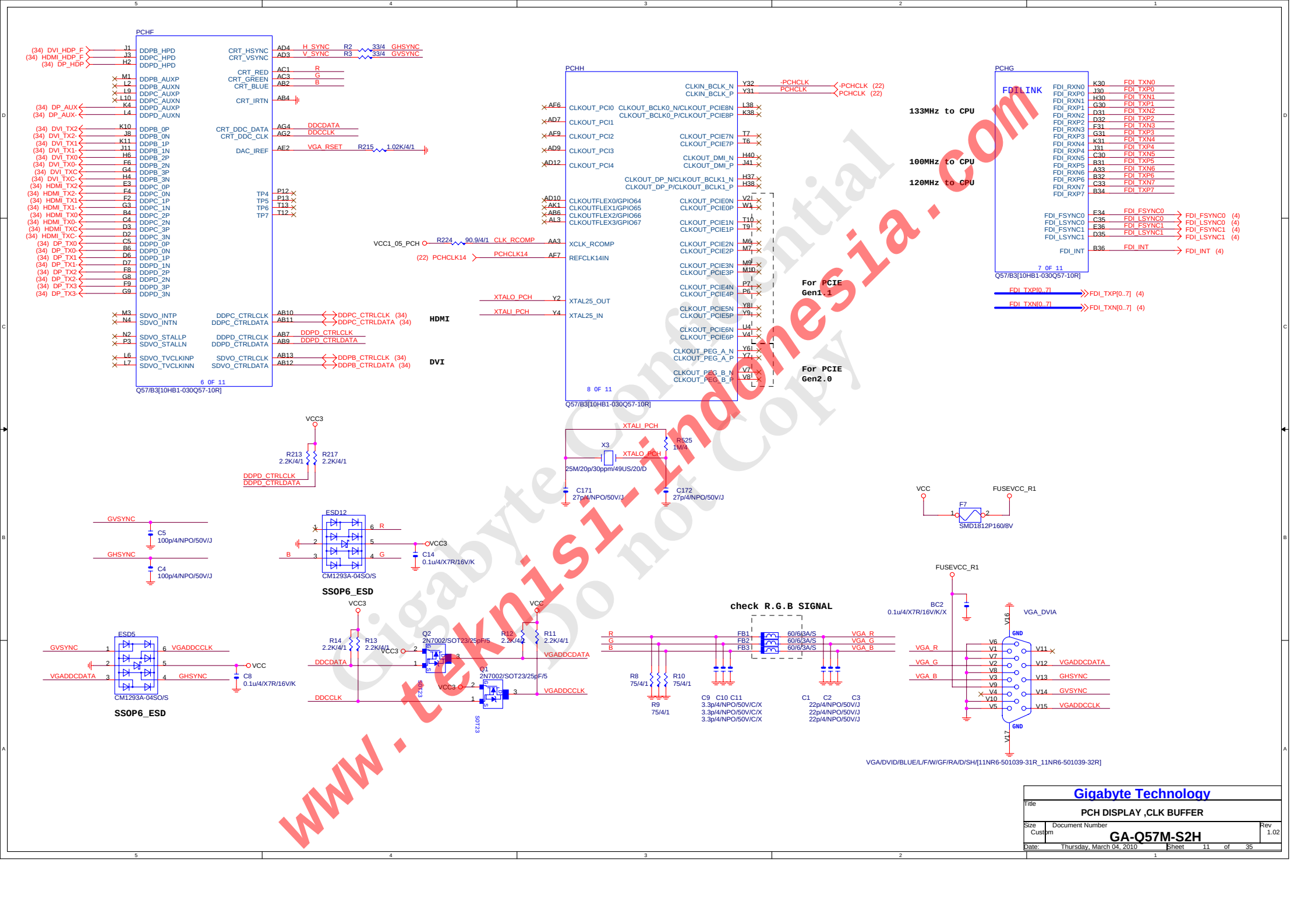
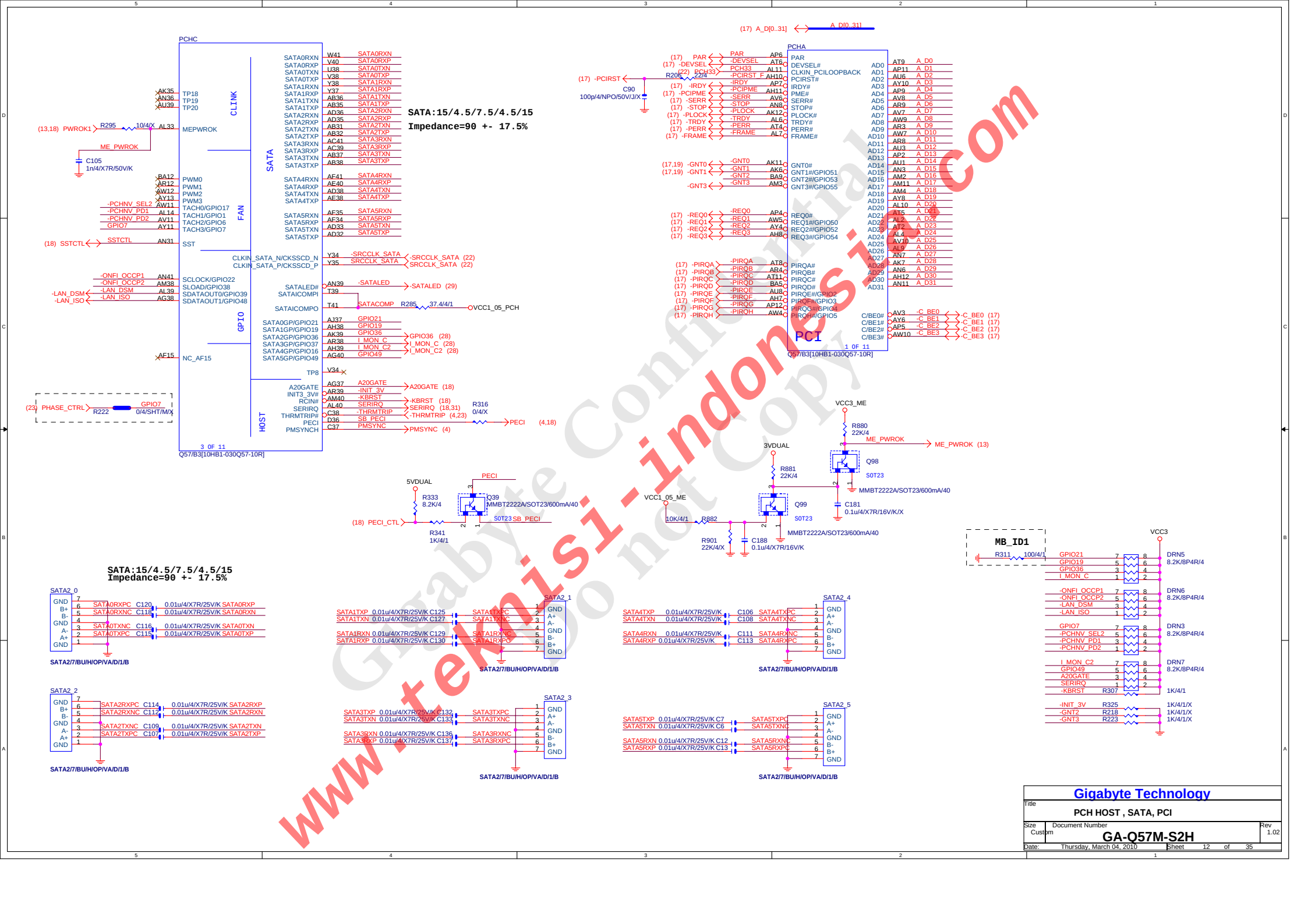
Gigabyte Technology



Gigabyte Technology			
Title: PCH DISPLAY ,CLK BUFFER			
Size: Custom	Document Number: GA-Q57M-S2H		Rev: 1.02
Date: Thursday, March 04, 2010	Sheet 11 of 35		


PCHC
SATA:15/4.5/7.5/4.5/15
Impedance=90 +- 17.5%
3 0F 11
Q57/B3[10HB1-030Q57-10R]
PCHA
PCI
1 0F 11
Q57/B3[10HB1-030Q57-10R]
SATA2_0
SATA2_1
SATA2_2
SATA2_3
SATA2_4
SATA2_5
SATA2/7/BU/H/OP/VA/D/1/B
MB_ID1
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PCH HOST , SATA, PCI
GA-Q57M-S2H
Rev 1.02
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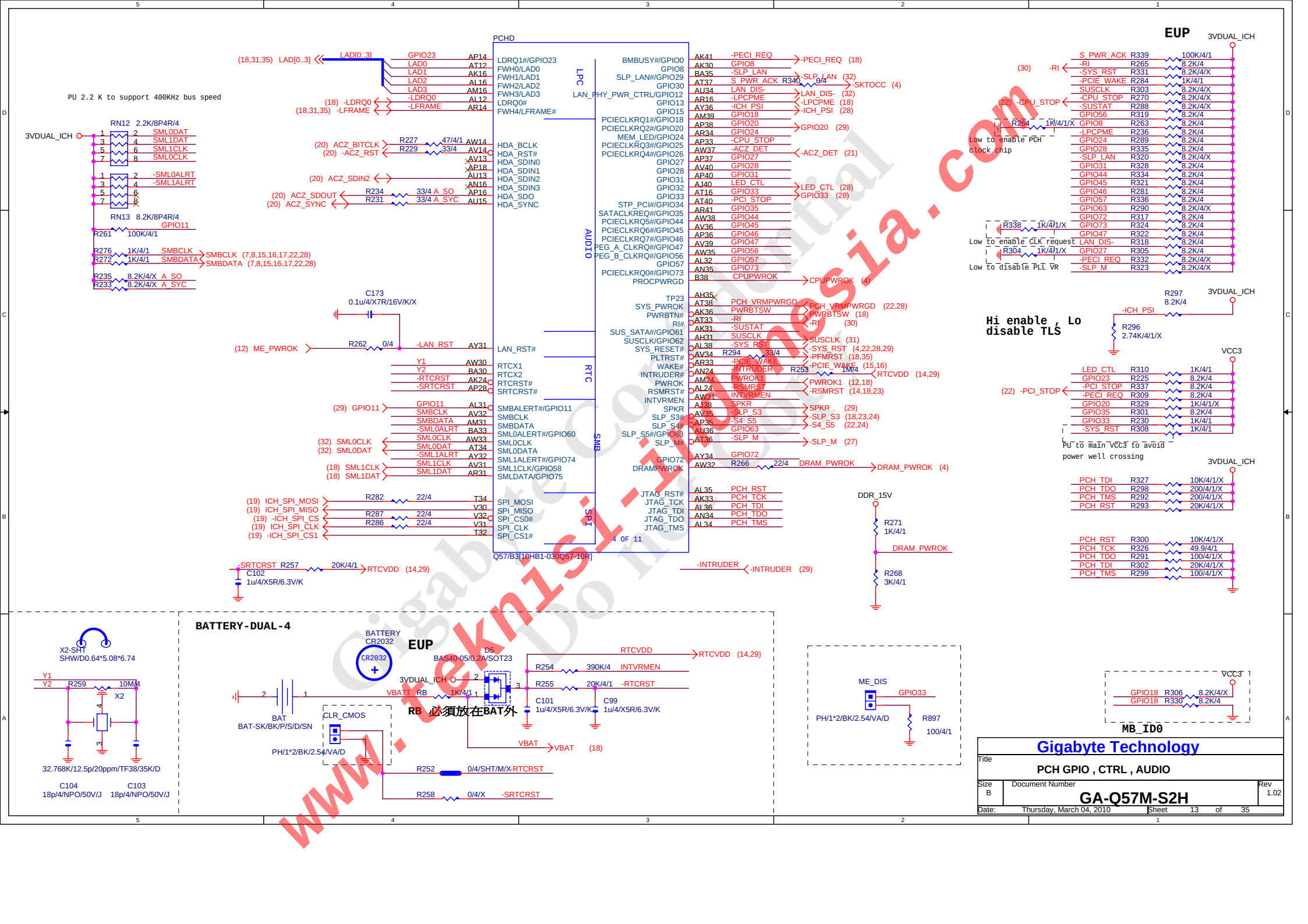

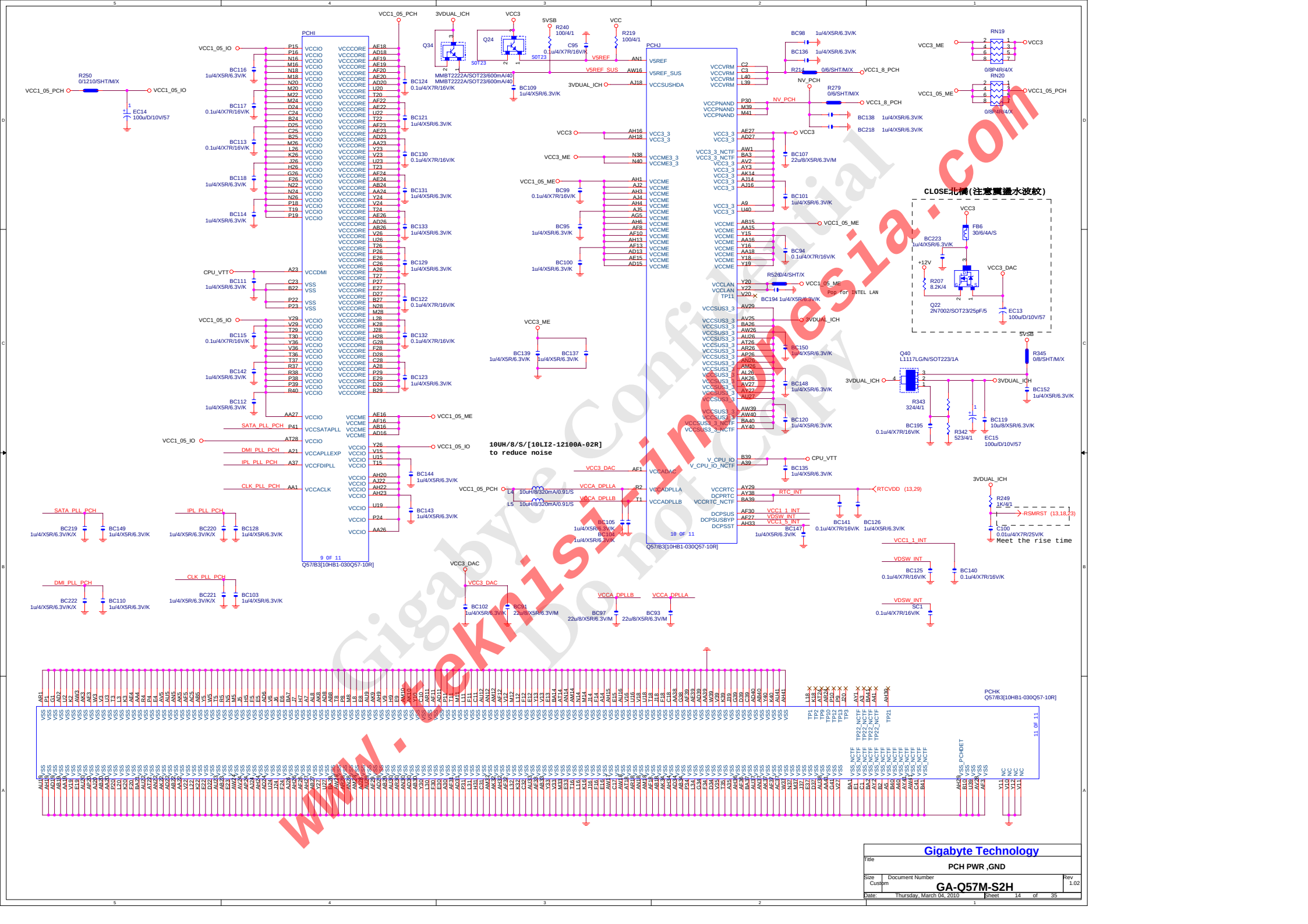
PCHI
PCHJ
PCHK
Q57/B3[10HB1-030Q57-10R]
9 OF 11
10 OF 11
11 OF 11
10UH/8/S/[10LI2-12100A-02R]
to reduce noise
CLOSE北橋(注意震盪水波紋)
Pon for INTEL LAN
Gigabyte Technology
PCH PWR ,GND
GA-Q57M-S2H
Rev 1.02
Thursday, March 04, 2010
Sheet 14 of 35
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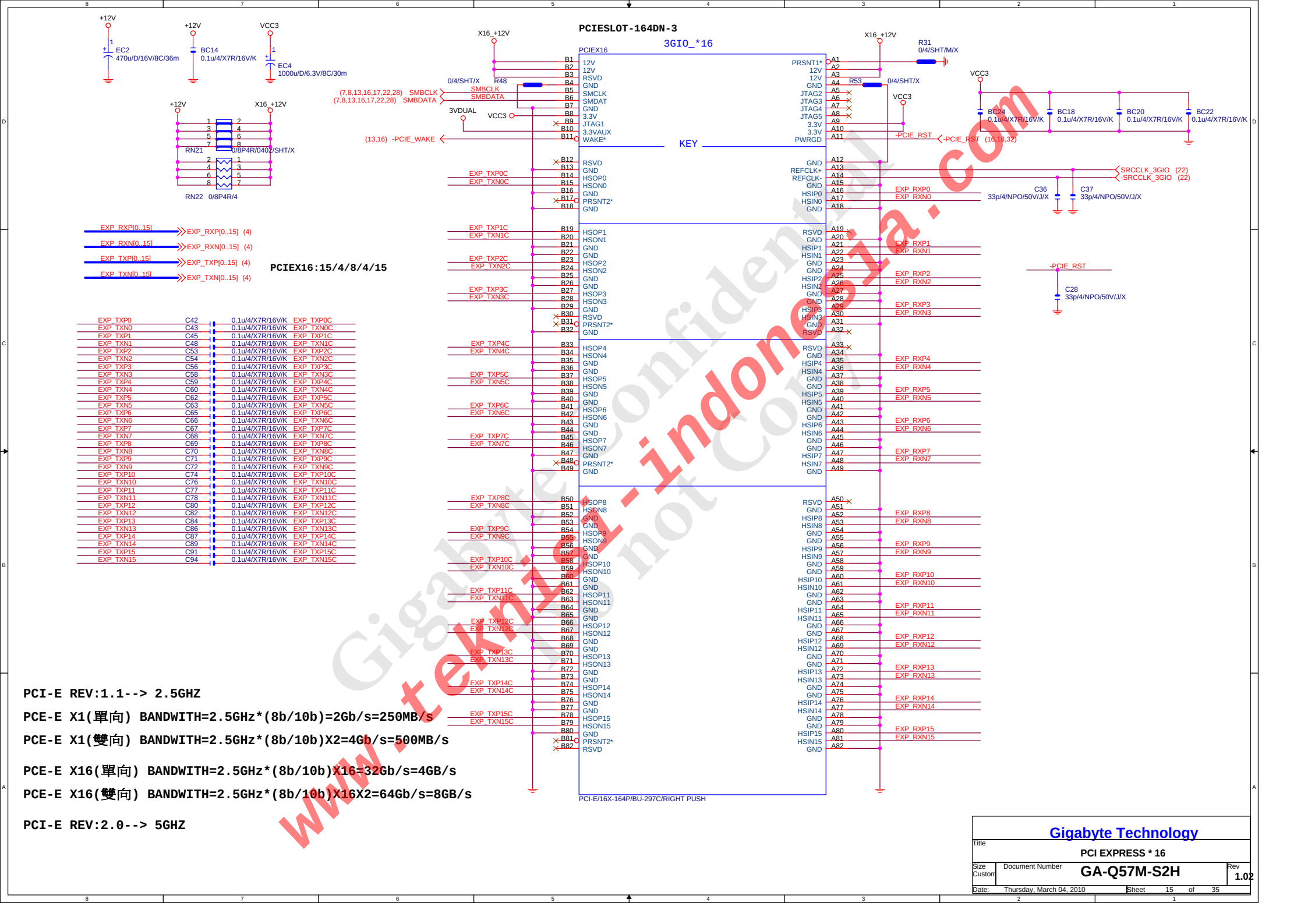
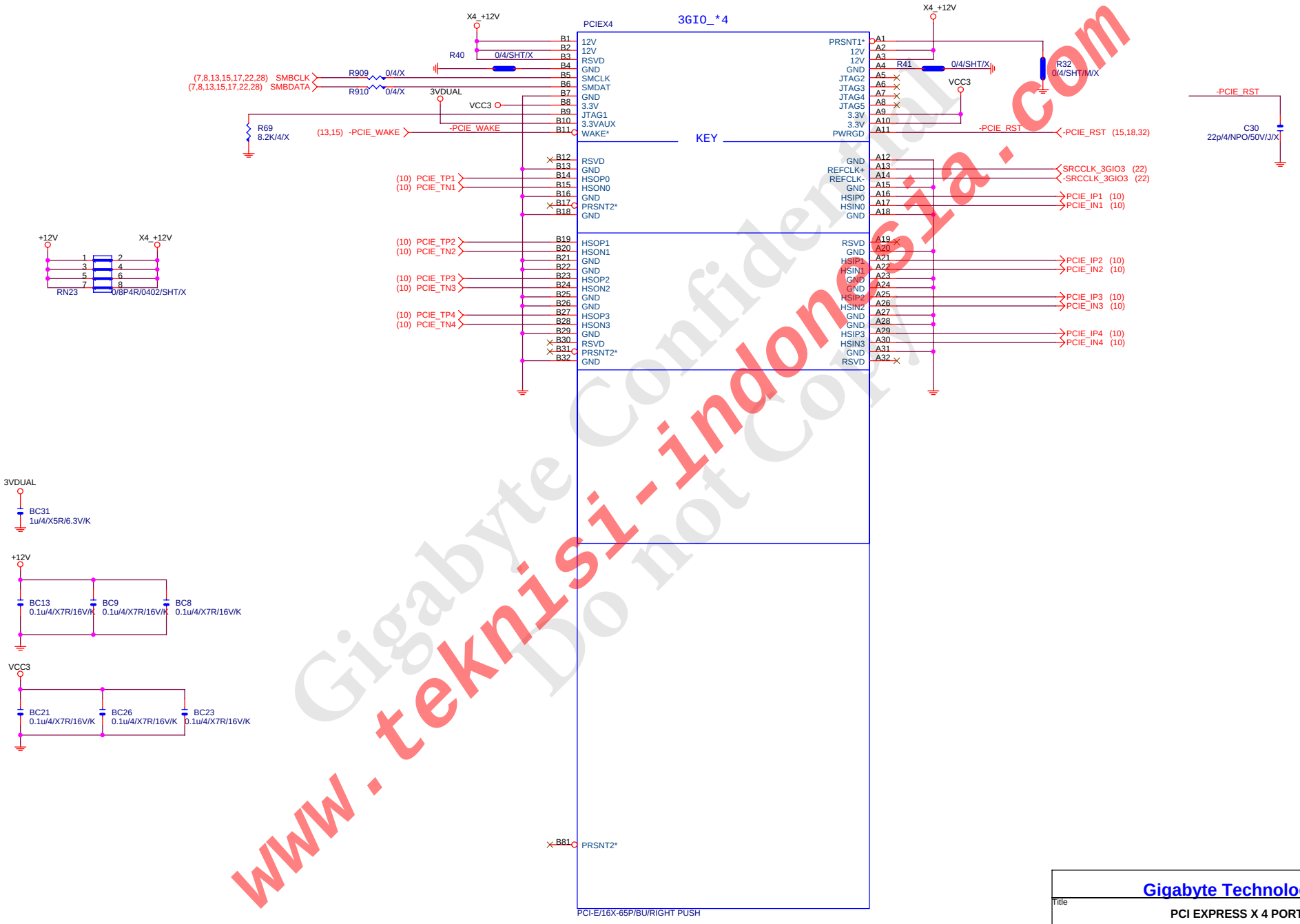
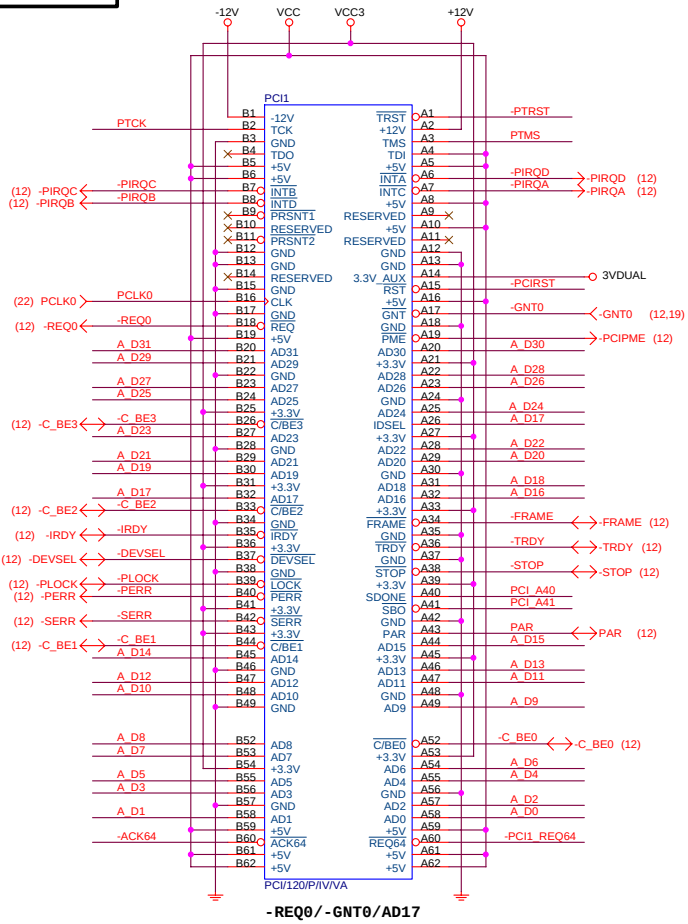


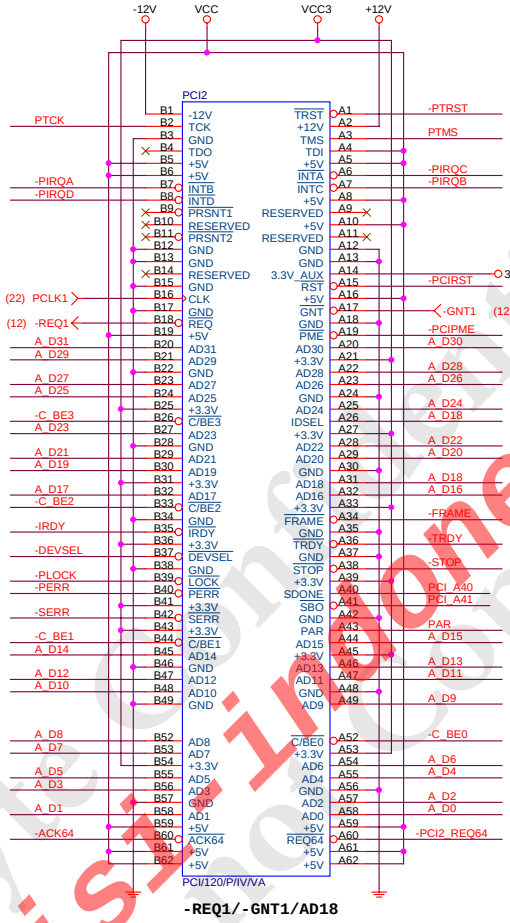
PCIESLOT-64D-98D-1

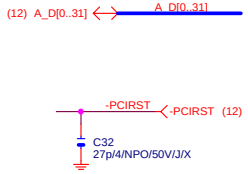


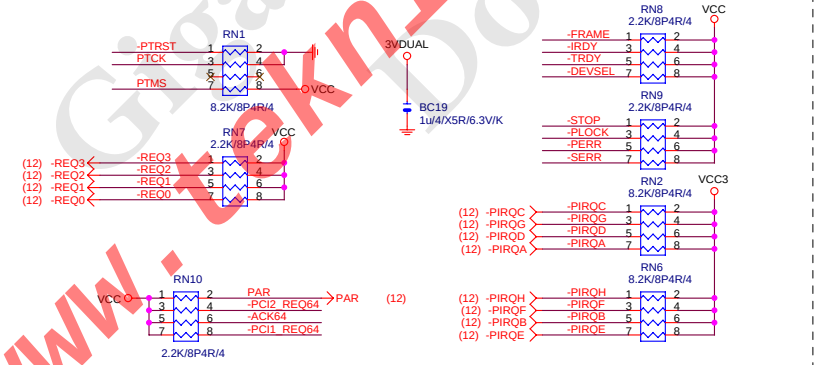
Gigabyte Technology		
Title: PCI EXPRESS X 4 PORT		
Size: Custom	Document Number: GA-Q57M-S2H	Rev: 1.02
Date: Thursday, March 04, 2010	Sheet 16 of 35	

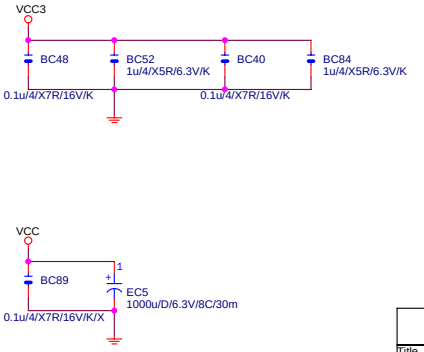
PCI1,2 SLOT



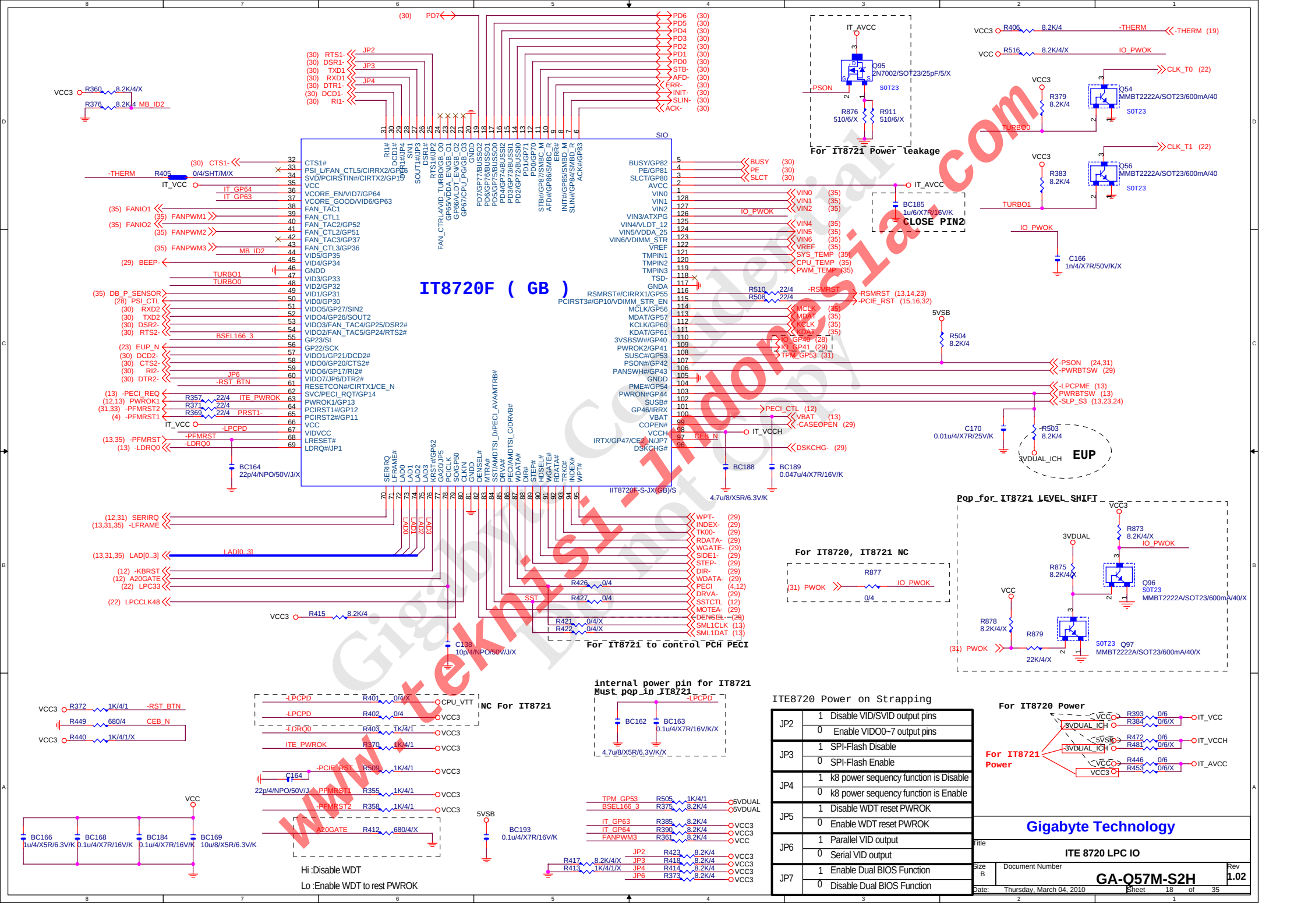




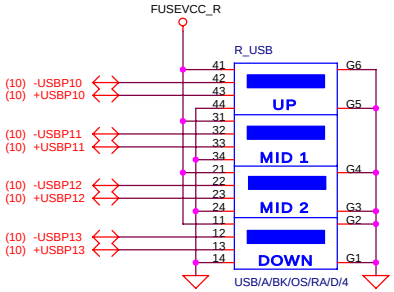


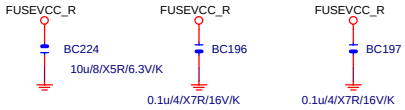


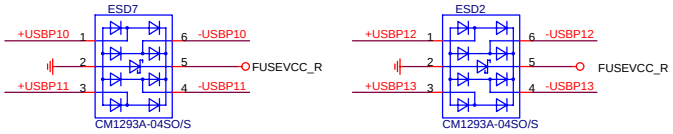
Gigabyte Technology			
Title: PCI SLOT 1, 2			
Size: Custom	Document Number: GA-Q57M-S2H		Rev: 1.02
Date: Thursday, March 04, 2010	Sheet 17 of 35		



RUSB

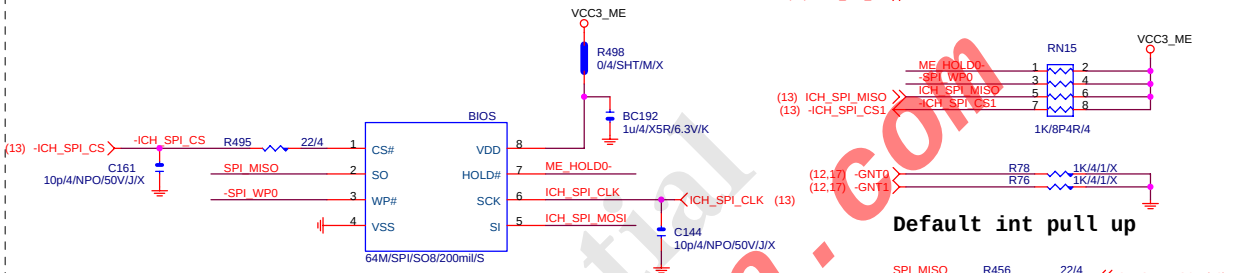






DUAL BIOS

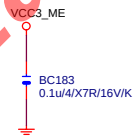
MOSI pull up to enable iTPM , floating to disable



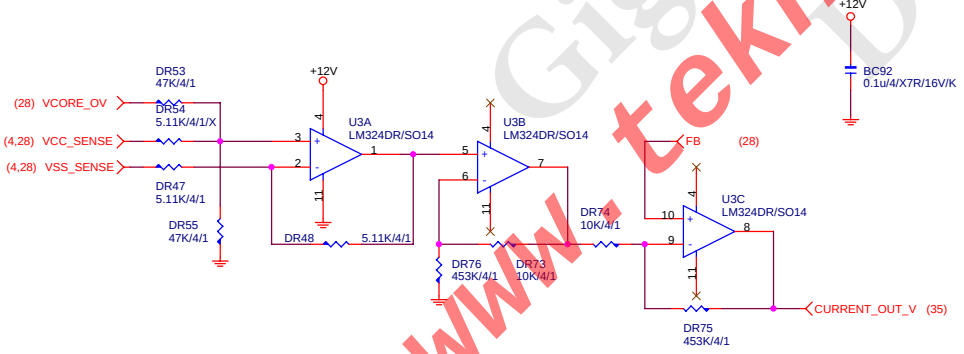
r1.0 DG;0.7 CRB

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

1 means floating
0 means PD 1K



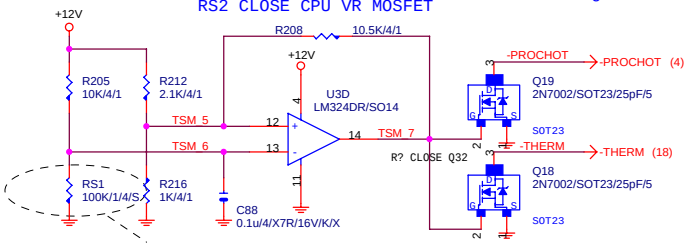
DYNAMIC CURRENT OC



-PROHOT

Over 125 degree assert
Below 115 degree deassert

RS2 CLOSE CPU VR MOSFET

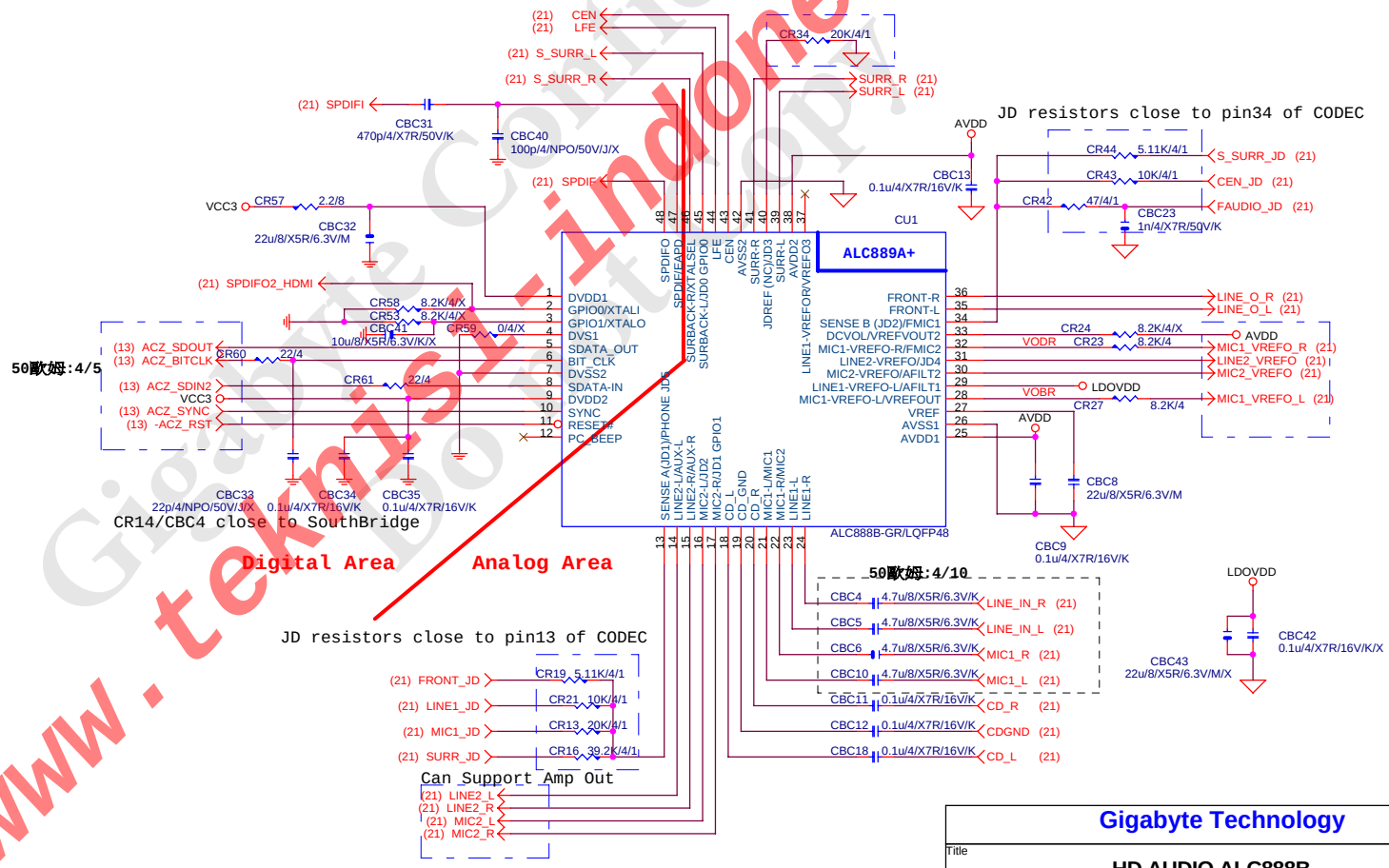


CLOSE PWM HOT MOSFET

Gigabyte Technology		
Title: BIOS & PROHOT/Dynamic O.C.		
Size: Custom	Document Number: GA-Q57M-S2H	Rev: 1.02
Date: Thursday, March 04, 2010	Sheet 19 of 35	

AZALIA CODEC *ALC883/ALC888-A/ALC888B/ALC888-VD/ALC892/ALC889/ALC889A Colay*

	ALC883	ALC888-VA	ALC888B	ALC888-VD	ALC892 ALC887-VD	ALC889	ALC889A	ALC892R
PIN2	X	X	X	X	X	X	CR58=8.2K/4	X
PIN3	X	X	X	CBC41=10U	CBC41=10U	X	CR53=8.2K/4	CBC41=10U
PIN4	CR59=0/4	CR59=0/4	X	X	X	CR59=0/4	CR59=0/4	X
PIN29(For MIC Vref)	X	X	X	X	X	X	X	
* PIN33	CR24=8.2K	X	X	X	X	X	X	X
PIN40	20K/1%	20K/1%	20K/1%	20K/1%	20K/1%	20K/1%	20K/0.1%	20K/1%
SPDIF-SHARE	CR56=0/4	CR56=0/4	CR63=0/4	CR56=0/4	CR63=0/4	CR63=0/4	CR56=0/4	CR63=0/4
Audio input Cap : CBC4/CBC5/CBC6/ CBC10/CBC15/CBC17	4.7uF /X5R	4.7uF /X5R	4.7uF /X5R	4.7uF /X5R	4.7uF /X5R	10uF /X5R	4.7uF /X5R	4.7uF /X5R
Audio I/O resistors : CR32/CR15/CR12/CR17/ CR22/CR26/CR51/CR25/ CR52/CR40/CR3/CR1/ CR9/CR6/CR36/CR38	75 ohm	75 ohm	75 ohm	75 ohm	75 ohm	66 ohm or lower	75 ohm	75 ohm
Embedded LDO: CR64/CR66	X	X	X	Stuff	Stuff	X	X	X
External LDO : CD1/CQ4/CQ5/CR65	Stuff	Stuff	Stuff	X	X	Stuff	Stuff	Stuff



Gigabyte Technology	
Title	HD AUDIO ALC888B
Size: Custom	Document Number: GA-Q57M-S2H
Rev: 1.02	
Date: Thursday, March 04, 2010	Sheet 20 of 35

CODEC POWER/EMI PAD

For EUP pop noise

5VSB 5VDUAL CR67 0/6 CR68 0/6/X AVDD CQ4 CD4148WP/1206/300mA

+12V CD1 CD4148WP/1206/300mA

CR47 0/6/SHT/M/X CR20 0/6

CQ5 78L05/SOT89/0.1A

CBC36 0.1u/4/X7R/16V/K/X

CBC29 22u/8/X5R/6.3V/M

CBC39 22u/8/X5R/6.3V/M

LDOVDD AVDD CR64 0/6/X CR65 0/6

5VSB CR66 0/6/X

CD2 AZ2225-01L/SOD323 Check placement

CR48 0/6/SHT/M/X CR31 0/4/X

DP_HDMI_SPDIFC

CBC38 0.1u/4/X7R/16V/K

FUSEVCC_R1 (20) SPDIF SPDIF S1 S2 S3 G1 G2 G3 G4

DP+HDMI+SPDIF/20P+19P+3P/BK/RA :: Location DP_HDMI_SPDIF

CD IN

(20) CD_L (20) CDGND (20) CD_R CD_IN 1 2 3 4

CR30 8.2K/4 CR49 8.2K/4 CR29 8.2K/4 SHR/1*4/BK/P/2.54/VA/D

SPDIF_IN

5VDUAL (20) SPDIFI CR62 0/4 SPDIF_I 1 2 3

SHR/1*3/WH/P/2.54/VA/D

(20) SPDIF CR56 0/4/XSPDIFO

(20) SPDIFO2_HDMI CR63 0/4

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

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

For HDMI SPDIF

AZALIA JACK

BTX AZALIA CONNECTOR

11NR6-403007-21R

AUDIOB

(20) LINE1_JD LINE1_JD AJ_A5 AJ_A2 A4 A1 GND LINE-IN

BLUE LINE-IN

(20) FRONT_JD FRONT_JD AJ_B5 AJ_B2 B4 B1 GND LINE-OUT

GREEN LINE-OUT

(20) MIC1_JD MIC1_JD AJ_C5 AJ_C2 C4 C1 GND MIC-IN

PINK MIC-IN

2X3RP/26P/OR,BK,GY,BU,GE,PK/RA

AUDIOA

(20) CEN_JD CEN_JD BJ_B5 BJ_B2 D4 D1 GND REAR

Orange CEN/LFE

(20) SURR_JD SURR_JD BJ_C5 BJ_C2 E4 E1 GND CEN

Black SURROUND

(20) S_SURR_JD S_SURR_JD BJ_A5 BJ_A2 F4 F1 GND SIDE

Gray SURROUND SIDE

G1 G2 G3 G4

2X3RP/26P/OR,BK,GY,BU,GE,PK/RA

LINE-OUT

(20) LINE_O_R CEC6 100u/D/10V/57 CR32 75/4/1 CR14 10K/4/1 CR33 10K/4/1 AJ_B5

(20) LINE_O_L CEC3 100u/D/10V/57 CR15 75/4/1 AJ_B2

CBC7 180p/4/NPO/50V/J CBC20 180p/4/NPO/50V/J

LINE-IN

Only reserved for ALC888

(20) LINE_IN_R CR12 75/4/1 AJ_A5

(20) LINE_IN_L CR17 75/4/1 AJ_A2

CBC16 180p/4/NPO/50V/J CBC21 180p/4/NPO/50V/J

MIC-IN

(20) MIC1_R CR22 75/4/1 AJ_C5

(20) MIC1_L CR26 75/4/1 AJ_C2

(20) MIC1_VREFO_L

(20) MIC1_VREFO_R

CBC2 180p/4/NPO/50V/J CBC3 180p/4/NPO/50V/J

SURROUND

EMI

(20) SURR_R CEC9 100u/D/10V/57 CR51 75/4/1 CR28 10K/4/1 CR45 10K/4/1 BJ_C5

(20) SURR_L CEC5 100u/D/10V/57 CR25 75/4/1 BJ_C2

CBC14 180p/4/NPO/50V/J CBC27 180p/4/NPO/50V/J

CEN/LFE

EMI

(20) LFE CEC10 100u/D/10V/57 CR52 75/4/1 CR41 10K/4/1 CR46 10K/4/1 BJ_B5

(20) CEN CEC4 100u/D/10V/57 CR40 75/4/1 BJ_B2

CBC22 180p/4/NPO/50V/J CBC28 180p/4/NPO/50V/J

SURR BACK

EMI

(20) S_SURR_R CEC2 100u/D/10V/57 CR3 75/4/1 CR2 10K/4/1 CR4 10K/4/1 BJ_A5

(20) S_SURR_L CEC1 100u/D/10V/57 CR1 75/4/1 BJ_A2

CBC1 180p/4/NPO/50V/J CBC26 180p/4/NPO/50V/J

AZALIA FRONT PANEL

CQ3 BAT54A/SOT23/200mA SOT23

(20) LINE2_VREFO CR37 8.2K/4 CR50 8.2K/4

CQ1 BAT54A/SOT23/200mA

(20) MIC2_VREFO CR5 8.2K/4 CR8 8.2K/4

(20) MIC2_L (20) MIC2_R CBC17 4.7u/8/X5R/6.3V/K CBC15 4.7u/8/X5R/6.3V/K CR9 CR6 75/4/1 M2_L M2_R

(20) FAUDIO_JD L2_R L2_L CR36 CR38 75/4/1

CR7 0/4/X

(20) LINE2_R (20) LINE2_L CEC7 CEC8 100u/D/10V/57 L2_R L2_L

Digital Area

3VDUAL CR10 8.2K/4

F_AUDIO CR35 CR39 10K/4/1 CR55 20K/4/1 CR54 39.2K/4/1

ACZ_DET (13)

PH/2*5K8/GED/2.54/VA/D

CBC24 CBC25 CBC30 CBC19 180p/4/NPO/50V/J

Gigabyte Technology

Title	AUDIO JACK	
Size Custom	Document Number GA-Q57M-S2H	Rev 1.02
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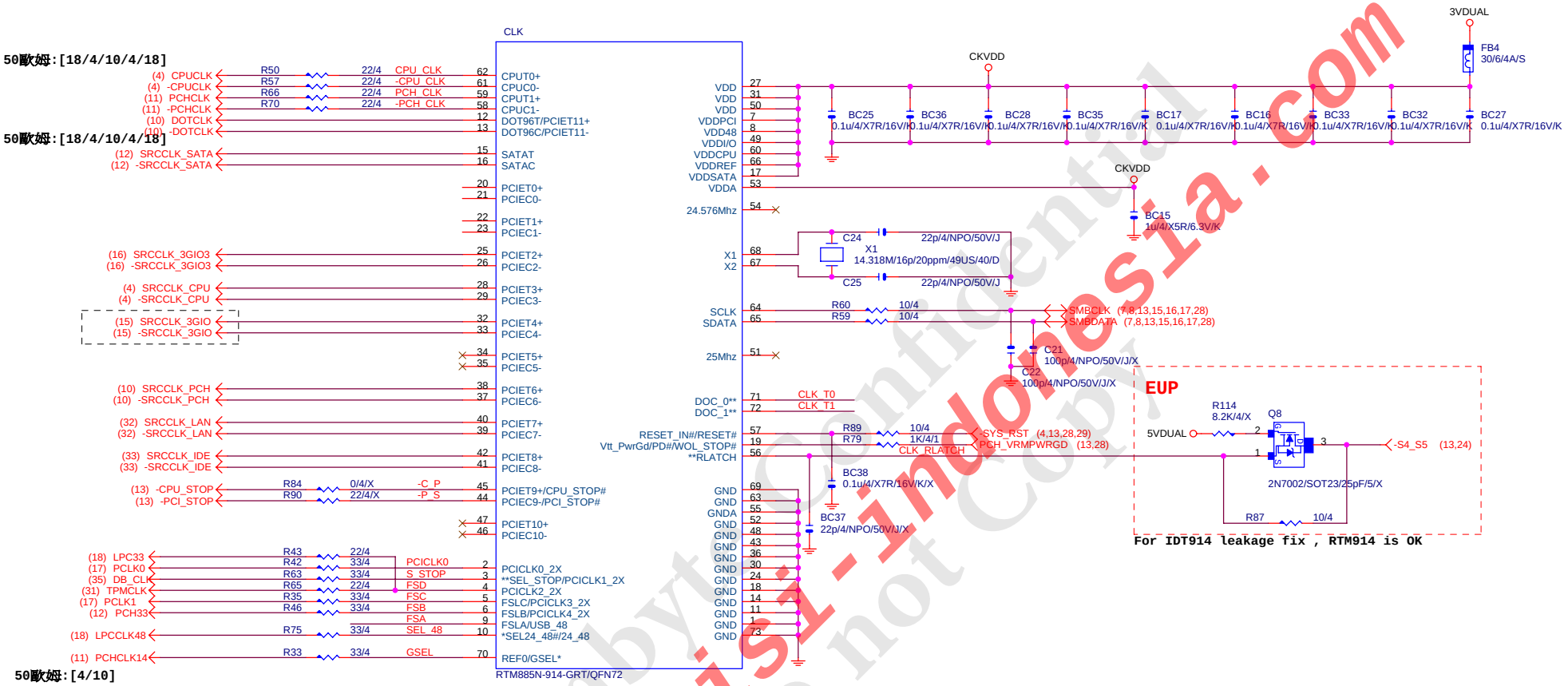
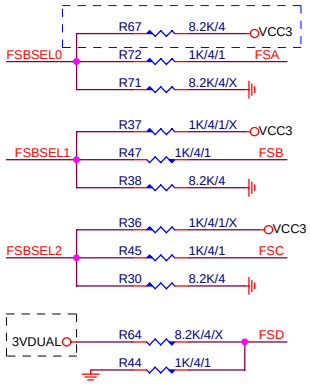
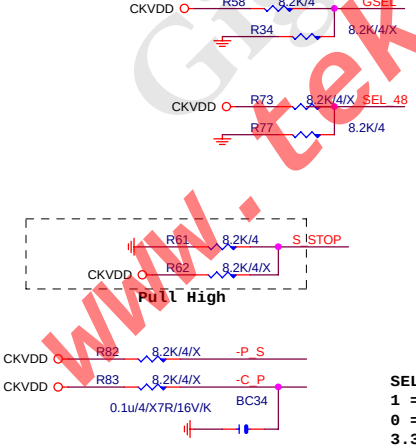
CLK GEN CK505



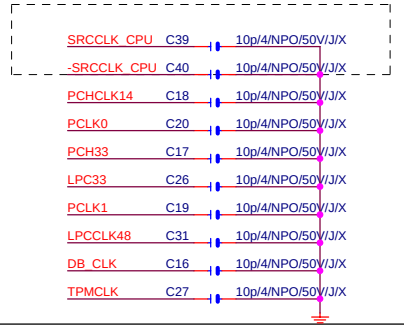




GSEL=1,96Mhz from 12/13
GSEL=0,100Mhz from12/13

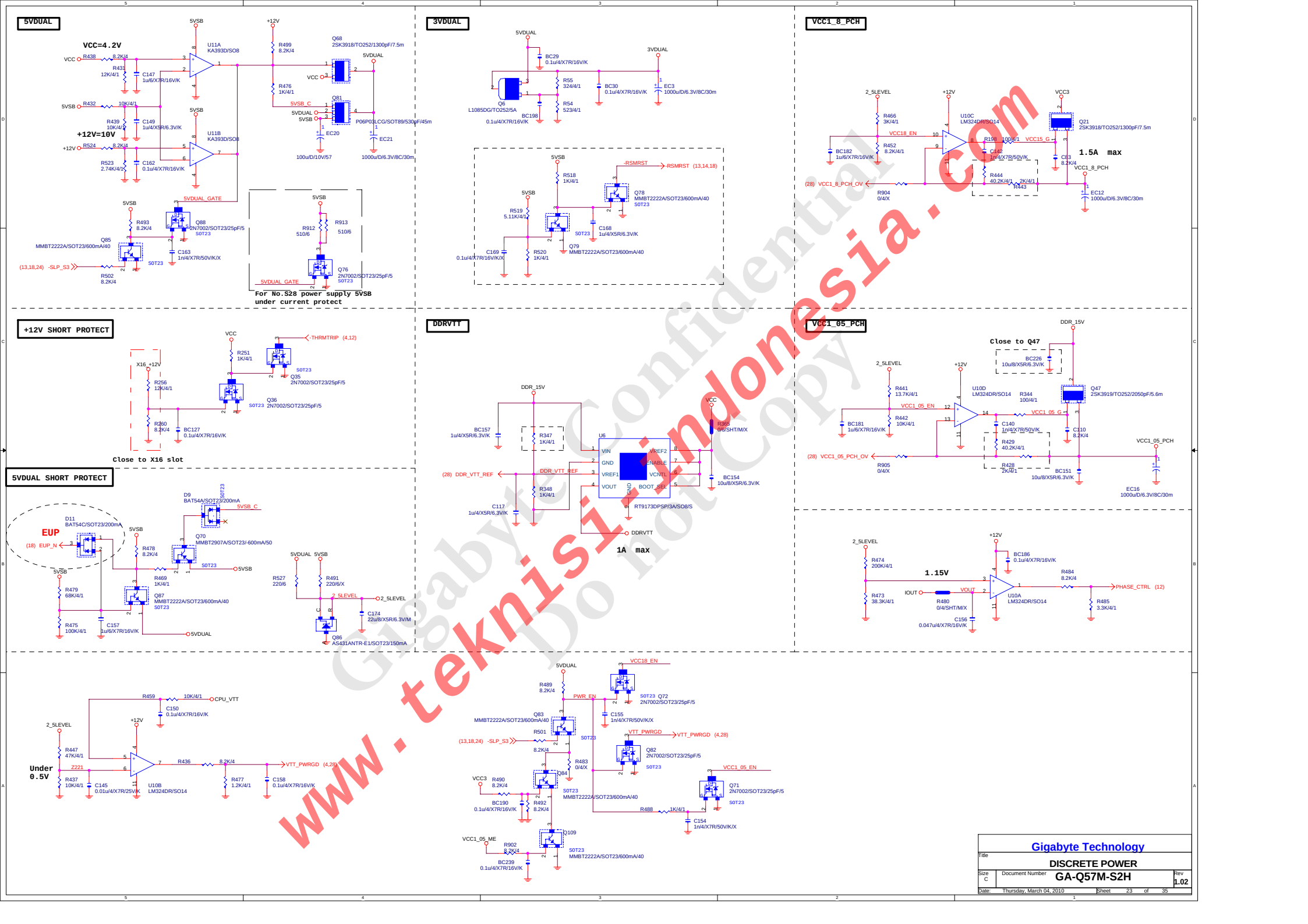
SEL_48=1, 24Mhz from pin10
SEL_48=0, 48Mhz from pin10

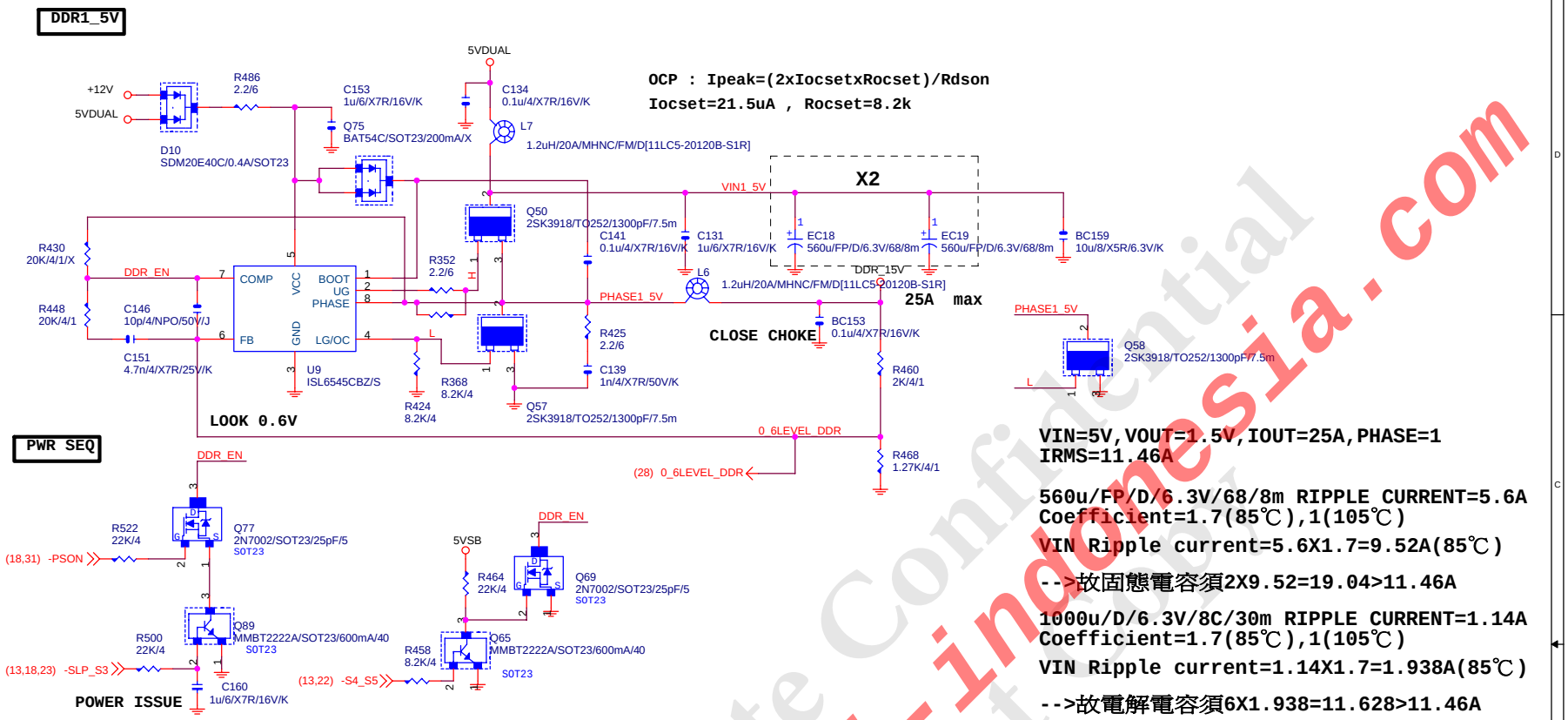
FSC	FSB	FSA	CPU
0	0	0	266MHz
0	0	1	133MHz
0	1	0	200MHz
0	1	1	166MHz
1	0	0	333MHz
1	1	0	400MHz



SEL_STOP: latched input to select pin functionality
1 = Selects pin 44/45 to be PCI_STOP#/CPU_STOP#
0 = Selects pin 44/45 to be PCIEX outputs ;
3.3V PCICLK output

Gigabyte Technology			
Title: CK505 CLK GEN			
Size: Custom	Document Number: GA-Q57M-S2H		Rev: 1.02
Date: Thursday, March 04, 2010		Sheet 22 of 35	





VIN=5V,VOUT=1.5V,IOUT=25A,PHASE=1
IRMS=11.46A

560u/FP/D/6.3V/68/8m RIPPLE CURRENT=5.6A
Coefficient=1.7(85℃),1(105℃)

VIN Ripple current=5.6X1.7=9.52A(85℃)

-->故固態電容須2X9.52=19.04>11.46A

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

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

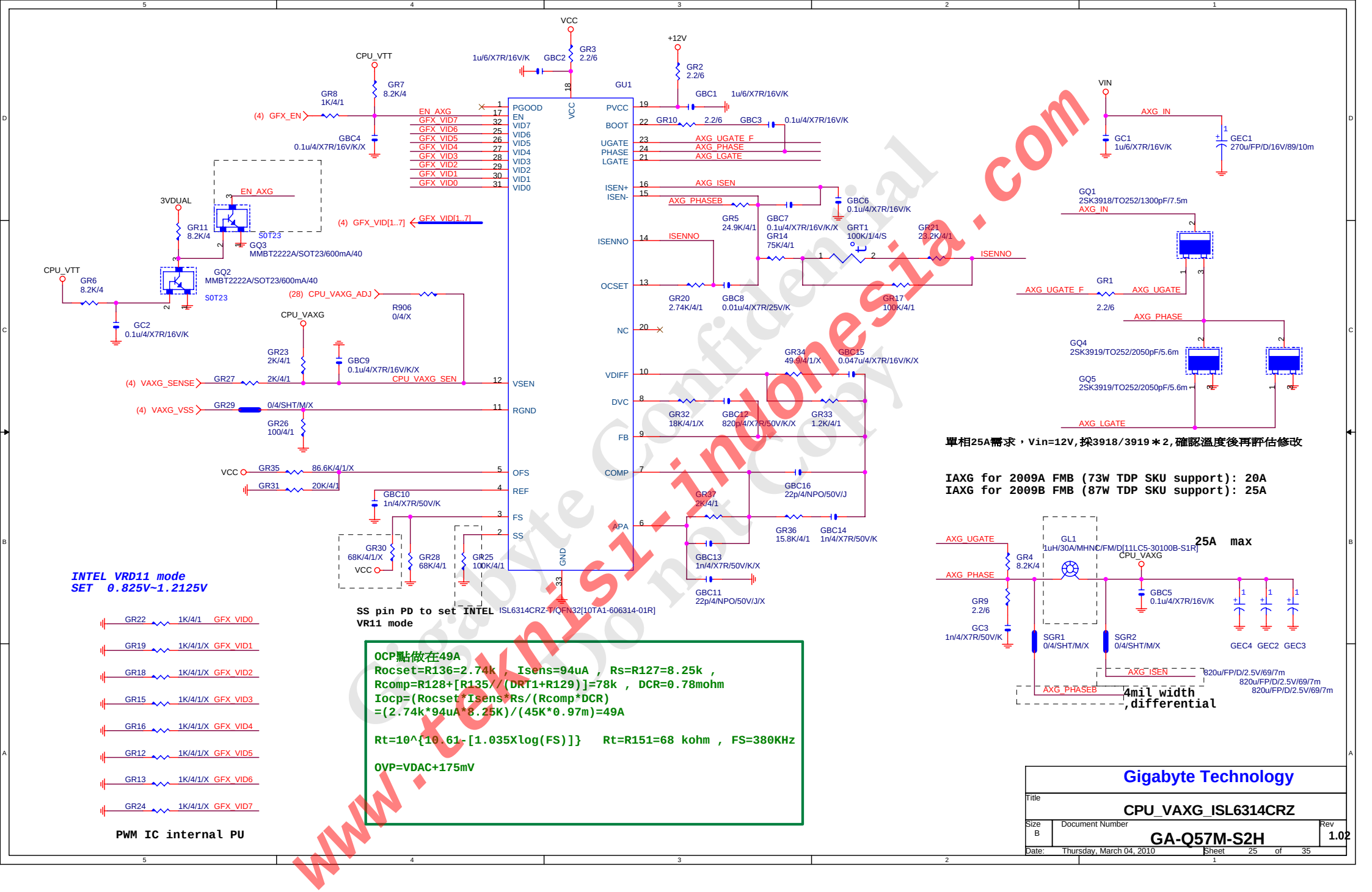
-->故電解電容須6X1.938=11.628>11.46A

VIN=3V,VOUT=1.05V,IOUT=7.5A,PHASE=1
IRMS=3.5A

-->故固態電容須1X9.52=9.52>3.5A

-->故電解電容須2X1.938=3.876>3.5A

Gigabyte Technology		
Title: DDR_15V		
Size: Custom	Document Number: GA-Q57M-S2H	Rev: 1.02
Date: Thursday, March 04, 2010	Sheet 24 of 35	



INTEL VRD11 mode
SET 0.825V~1.2125V

SS pin PD to set INTEL VR11 mode

PWM IC internal PU

單相25A需求，Vin=12V,採3918/3919＊2,確認溫度後再評估修改

IAXG for 2009A FMB (73W TDP SKU support): 20A
IAXG for 2009B FMB (87W TDP SKU support): 25A

25A max

4mil width ,differential

OCP點做在49A
Rocset=R136=2.74k , Isens=94uA , Rs=R127=8.25k ,
Rcomp=R128+[R135//(DRT1+R129)]=78k , DCR=0.78mohm
Iocp=(Rocset*Isens*Rs/(Rcomp*DCR)
=(2.74k*94uA*8.25K)/(45K*0.97m)=49A

Rt=10^{10.61-[1.035Xlog(FS)]} Rt=R151=68 kohm , FS=380KHz

OVP=VDAC+175mV

Gigabyte Technology			
Title: CPU_VAXG_ISL6314CRZ			
Size: B	Document Number: GA-Q57M-S2H		Rev: 1.02
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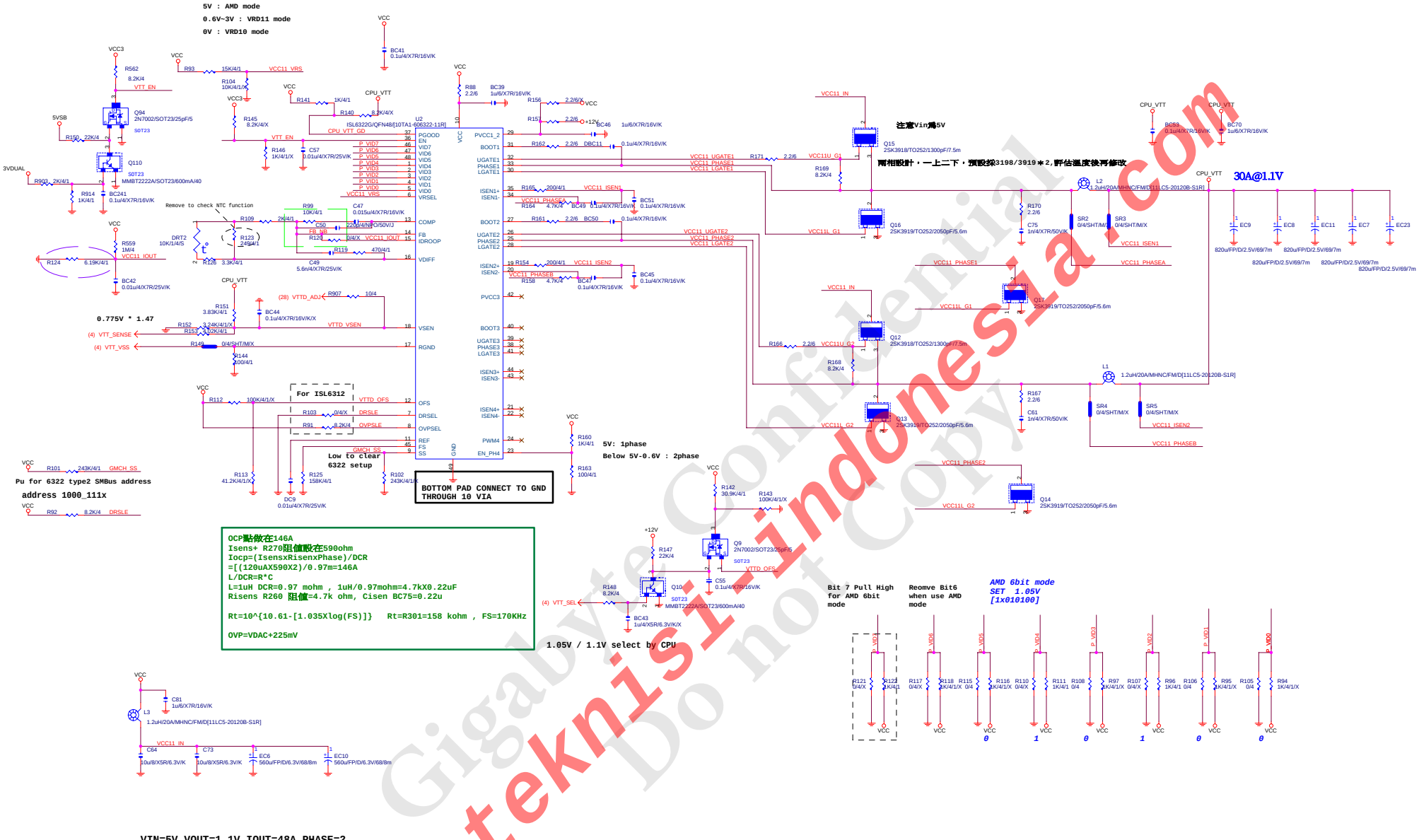

VIN=5V,VOUT=1.1V,IOUT=48A,PHASE=2
IRMS=11.91A

560u/FP/D/6.3V/68/8m RIPPLE CURRENT=5.6A
Coefficient=1.7(85℃),1(105℃)
VIN Ripple current=5.6X1.7=9.52A(85℃)

-->故固態電容須2X9.52=19.04>11.91A

1000u/D/6.3V/8C/30m RIPPLE CURRENT=1.14A
Coefficient=1.7(85℃),1(105℃)
VIN Ripple current=1.14X1.7=1.938A(85℃)

-->故電解電容須7X1.938=13.566>11.91A

GIGABYTE			
Title	CPU_VTT PWM_ISL6322CRZ		
Size: Custom	Document Number: GA-Q57M-S2H	Rev: 1.02	
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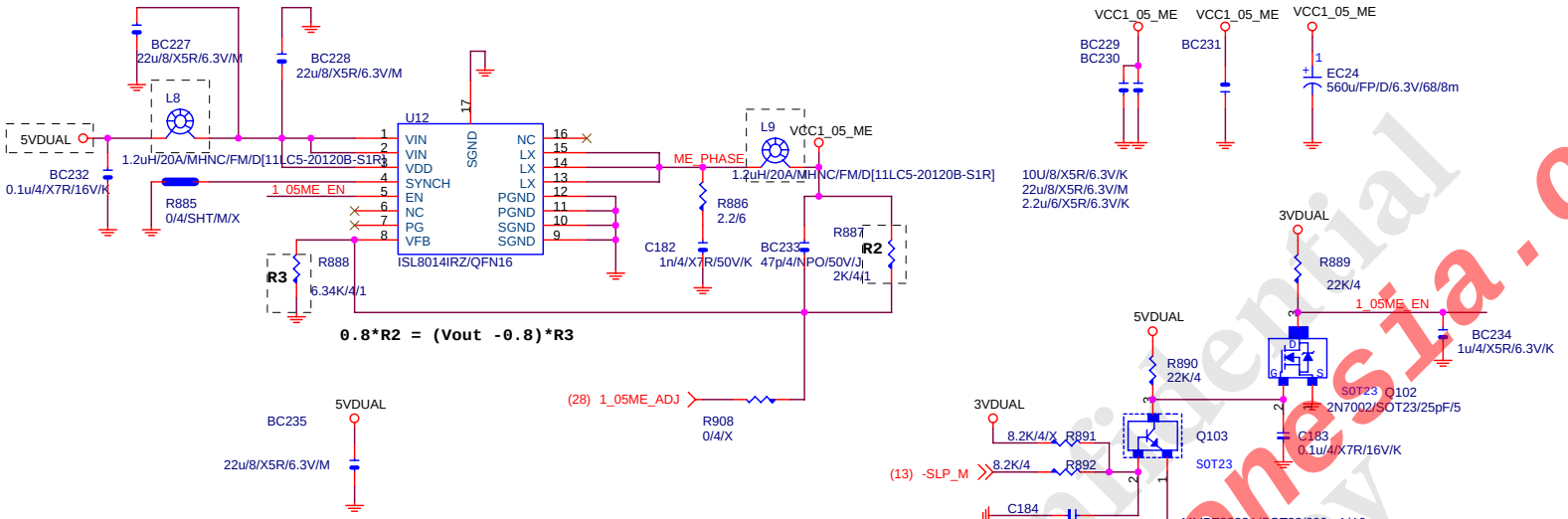
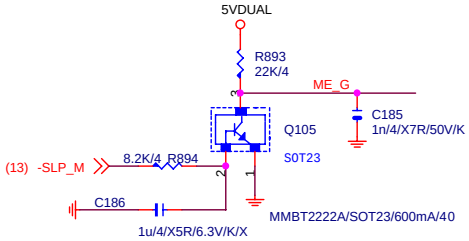
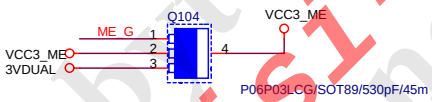
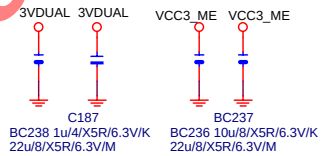
VCC1_05_ME



VCC3_ME







Gigabyte Technology		
Title: ME_POWER		
Size: B	Document Number: GA-Q57M-S2H	Rev: 1.02
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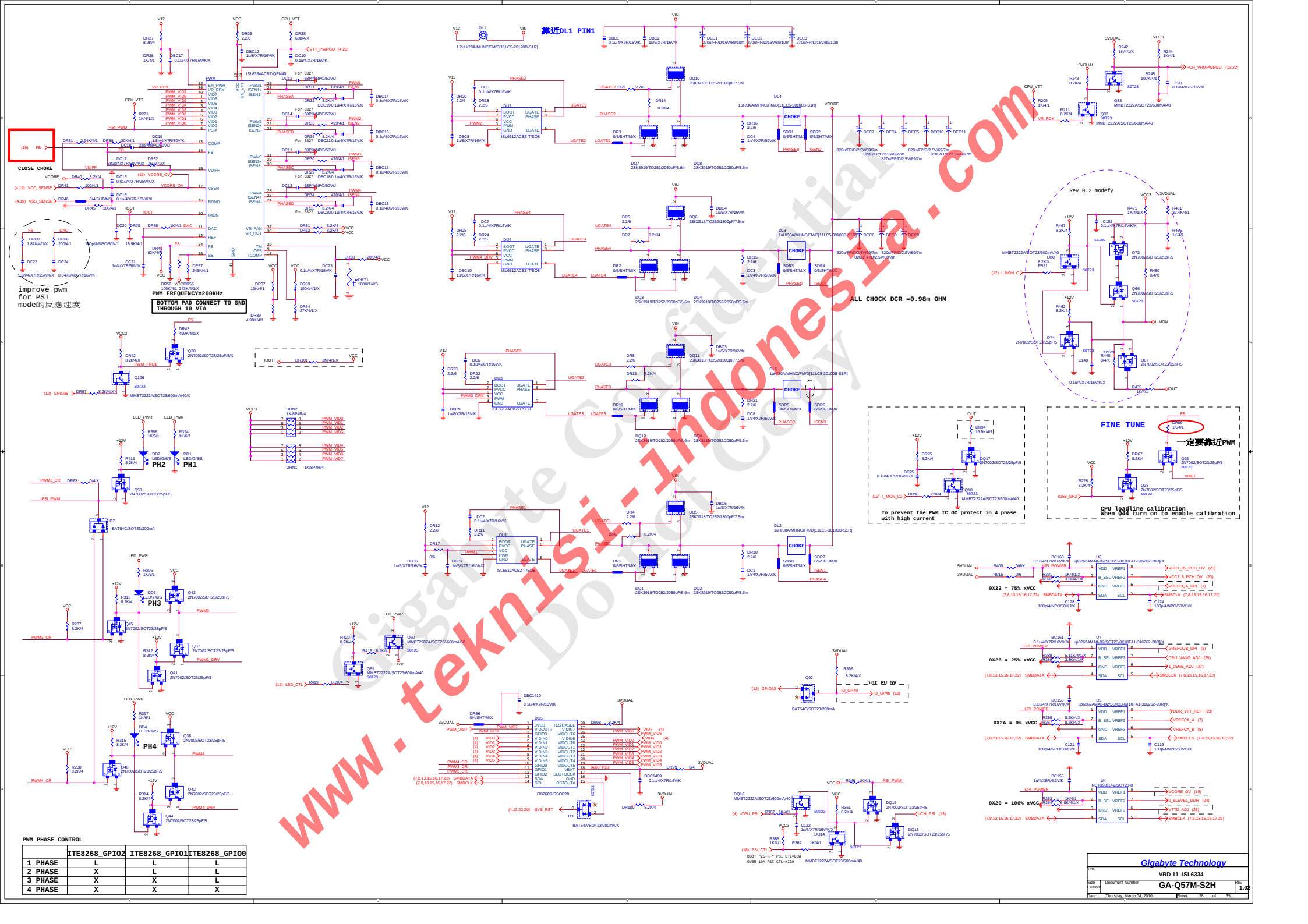
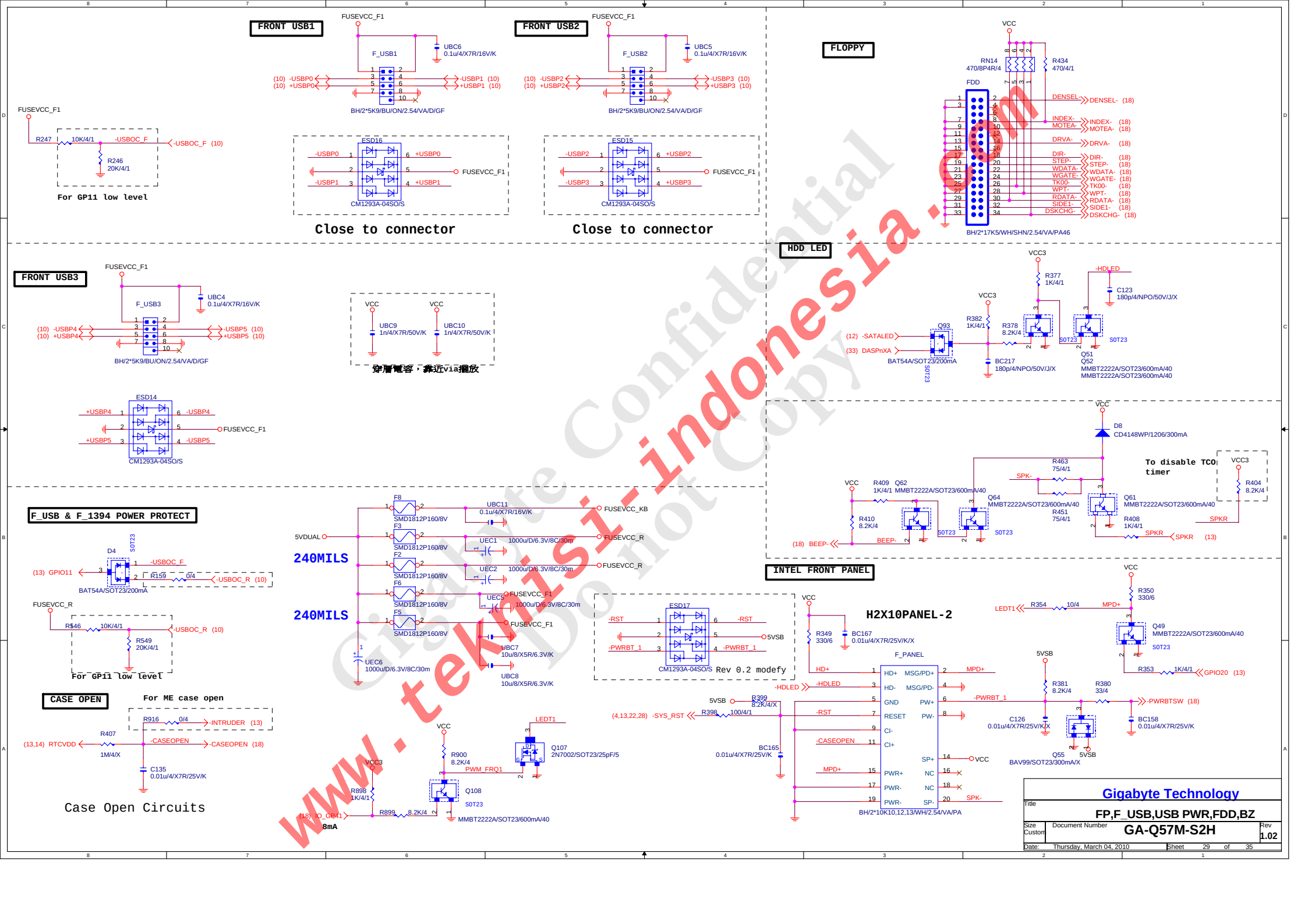


	ITE8268_GPIO2	ITE8268_GPIO1	ITE8268_GPIO0
1 PHASE	L	L	L
2 PHASE	X	L	L
3 PHASE	X	X	L
4 PHASE	X	X	X


FRONT USB1
FRONT USB2
FLOPPY
FRONT USB3
HDD LED
F_USB & F_1394 POWER PROTECT
INTEL FRONT PANEL
CASE OPEN
Close to connector
Close to connector
For GP11 low level
For GP11 low level
For ME case open
Case Open Circuits
240MILS
240MILS
H2X10PANEL-2
To disable TCO timer
Rev 0.2 modefy
穿層電容，靠近via擺放
Gigabyte Technology
FP,F_USB,USB PWR,FDD,BZ
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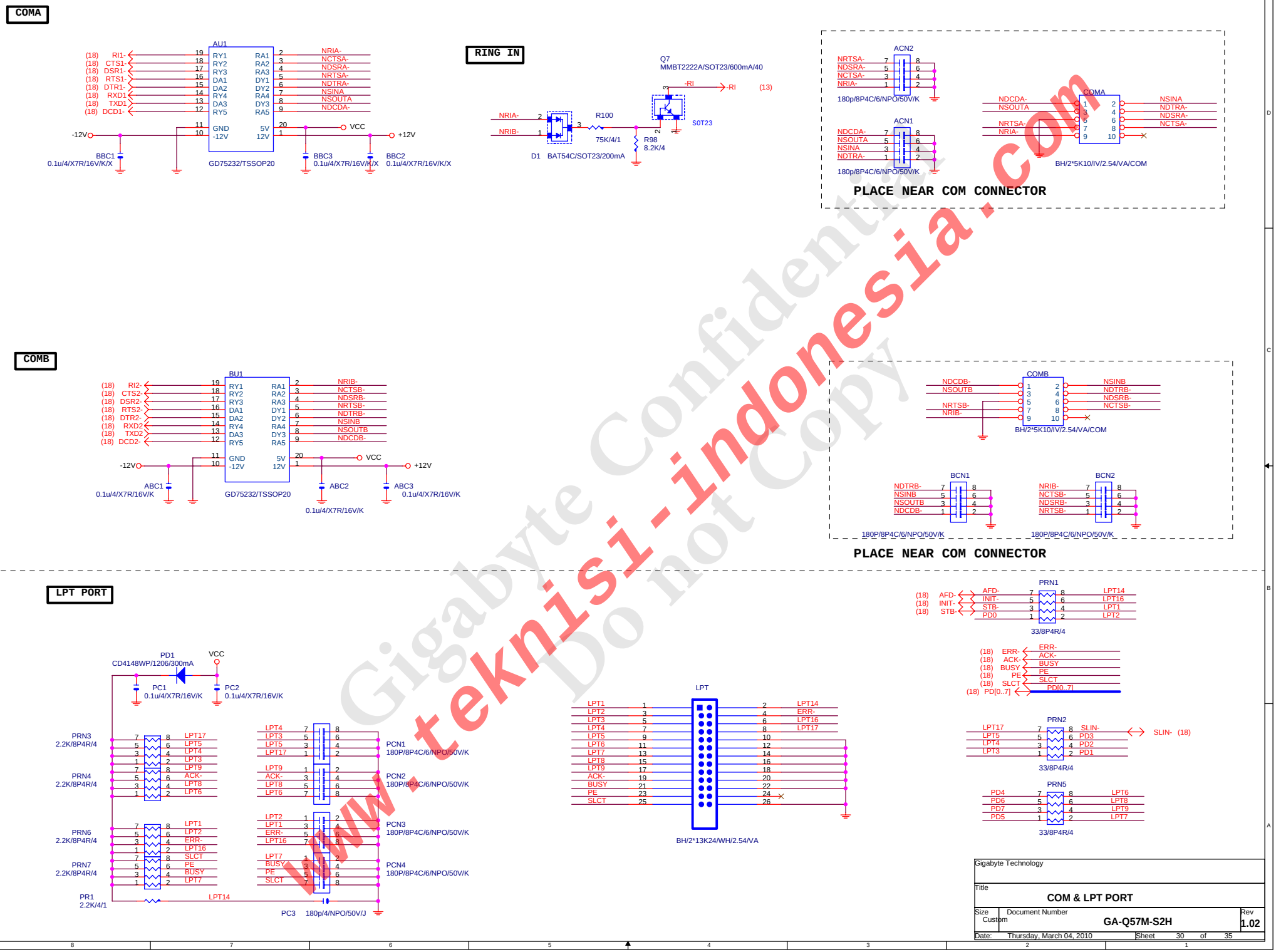
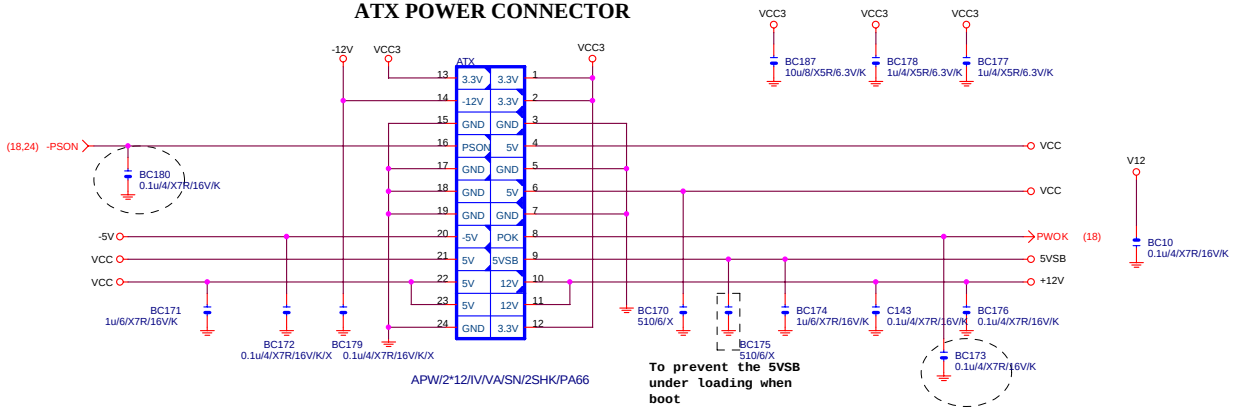
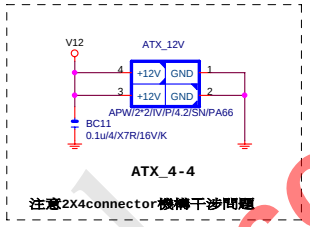
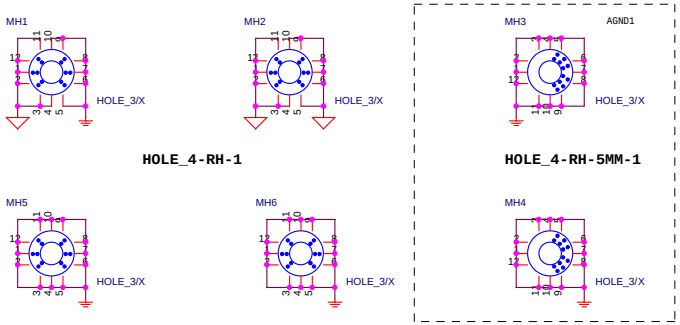
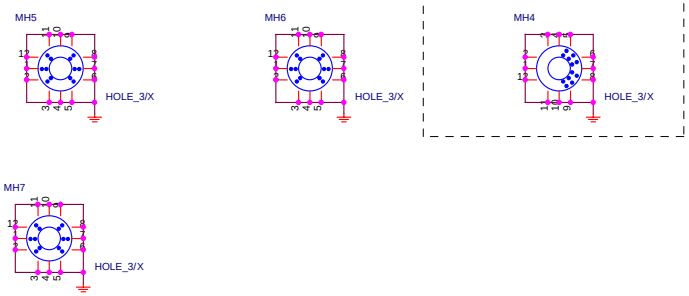


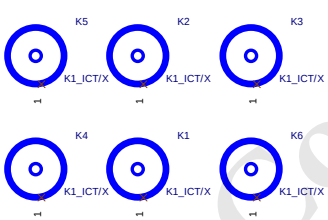
ATX POWER CONNECTOR



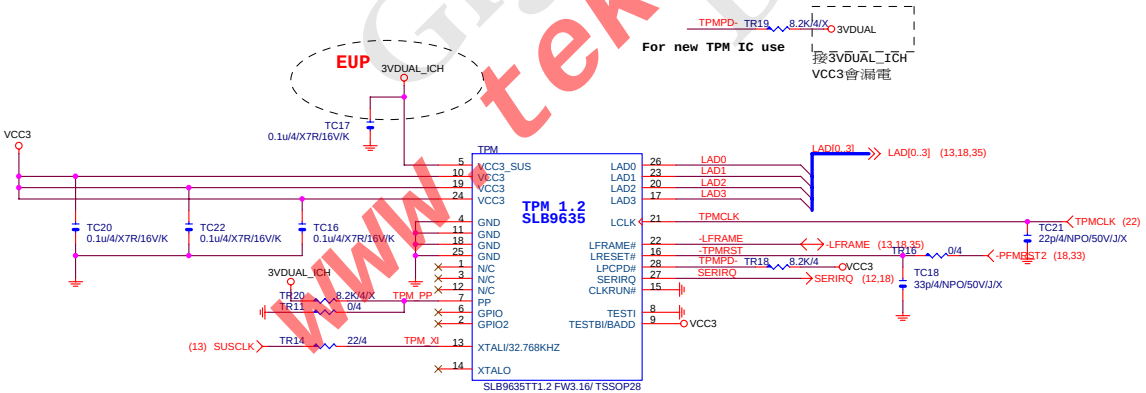


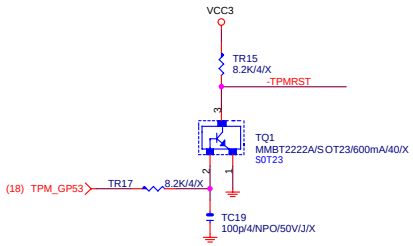






TPM





Gigabyte Technology			
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Size: Custom	Document Number: GA-Q57M-S2H		Rev: 1.02
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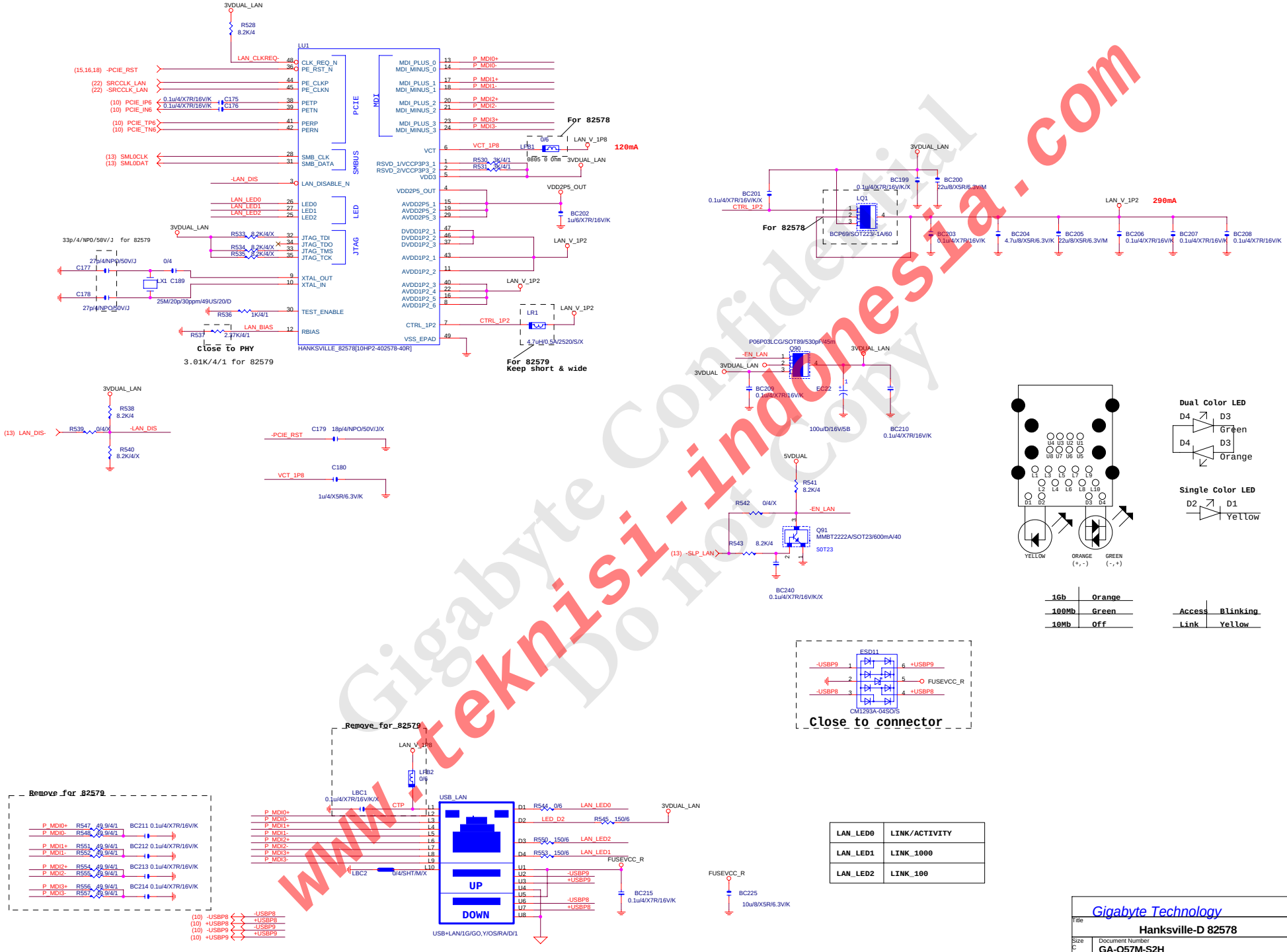

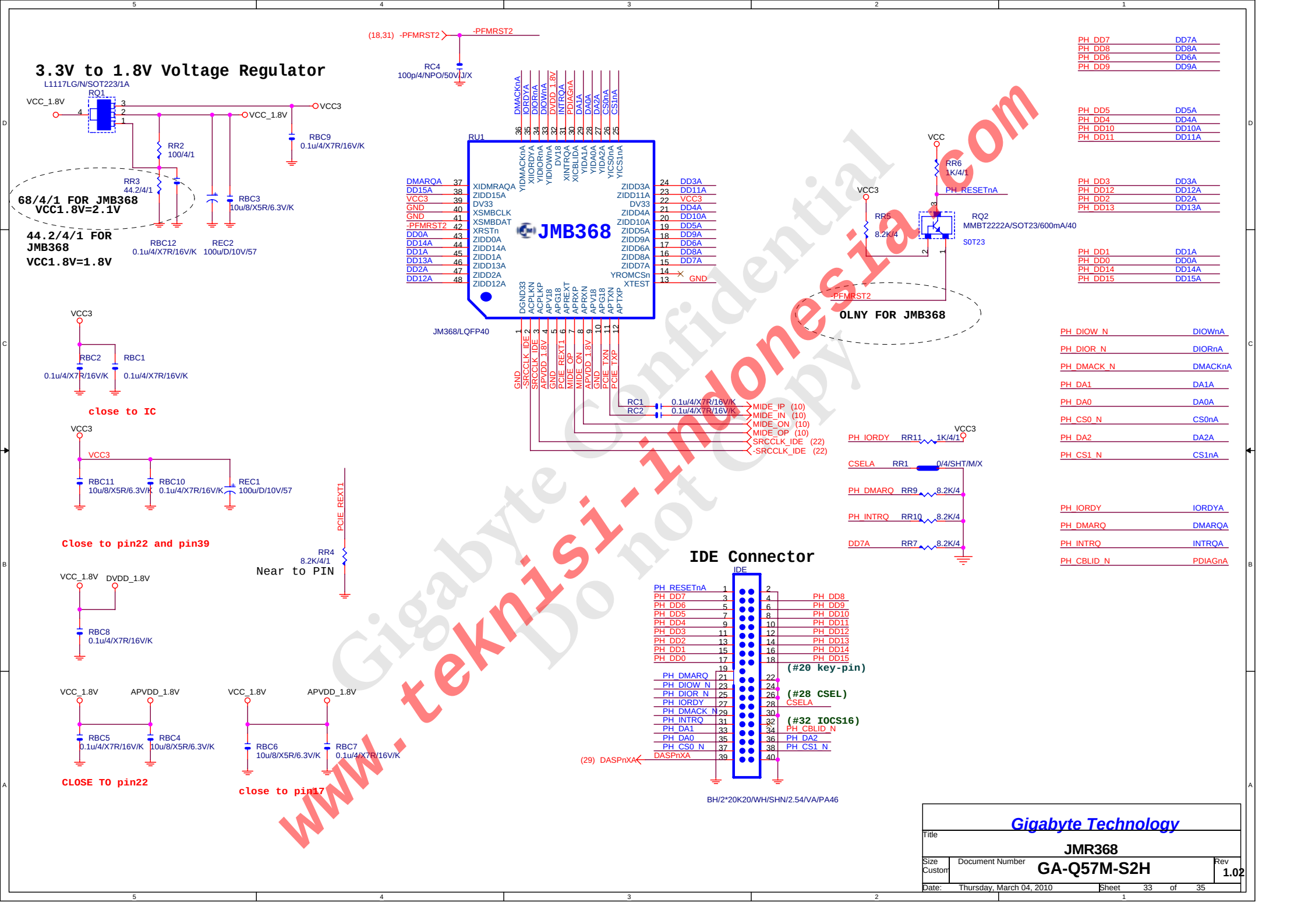

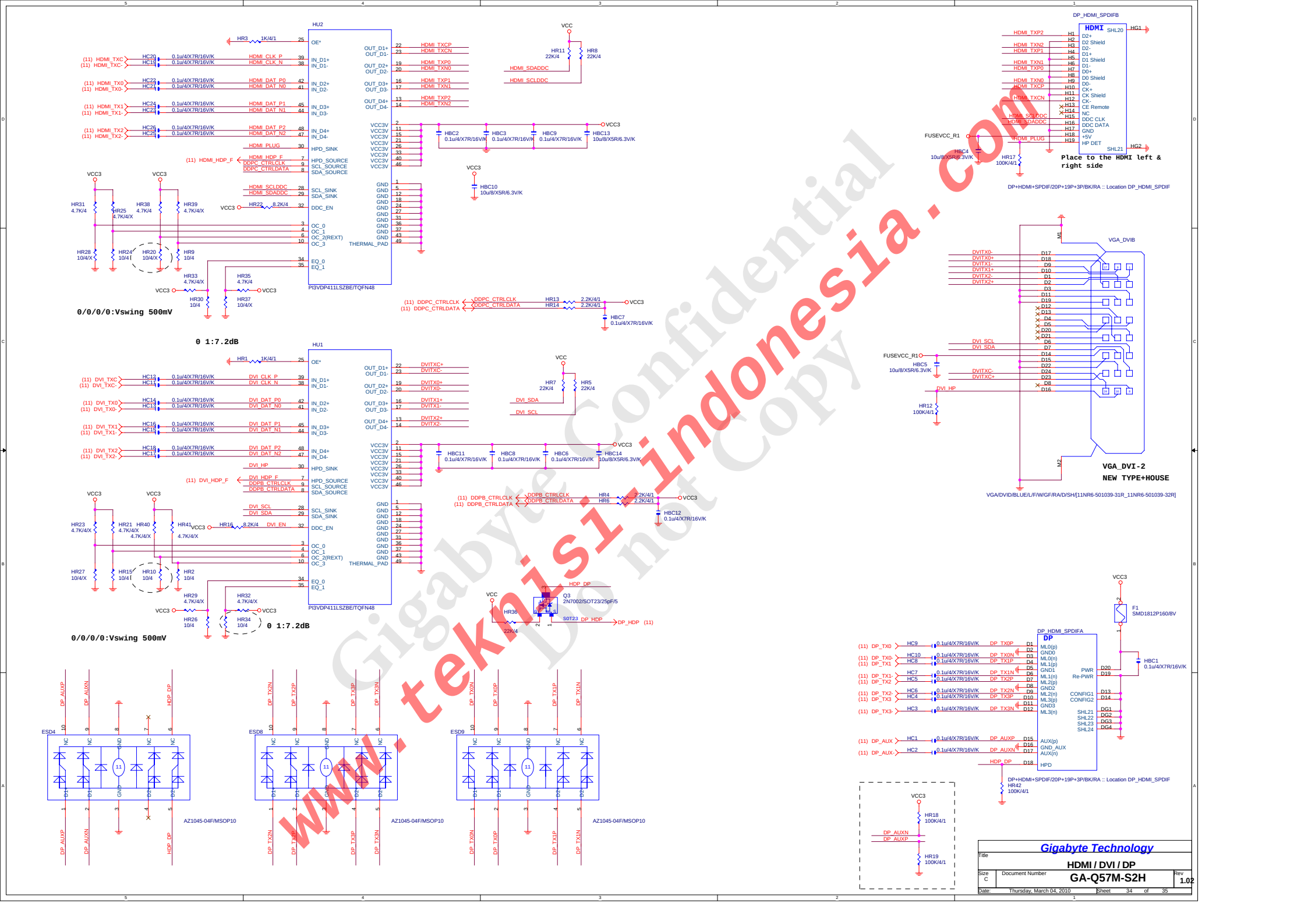
HU2
PI3VDP411LSZBE/TQFN48
0/0/0/0:Vswing 500mV
0 1:7.2dB
HU1
PI3VDP411LSZBE/TQFN48
0/0/0/0:Vswing 500mV
0 1:7.2dB
DP_HDMI_SPDIFB
HDMI SHL20
Place to the HDMI left & right side
DP+HDMI+SPDIF/20P+19P+3P/BK/RA :: Location DP_HDMI_SPDIF
VGA_DVIB
VGA_DVI-2
NEW TYPE+HOUSE
VGA/DVID/BLUE/L/F/W/GF/RA/D/SH[11NR6-501039-31R_11NR6-501039-32R]
DP_HDMI_SPDIFA
DP
DP+HDMI+SPDIF/20P+19P+3P/BK/RA :: Location DP_HDMI_SPDIF
ESD4
ESD8
ESD9
AZ1045-04F/MSOP10
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HDMI / DVI / DP
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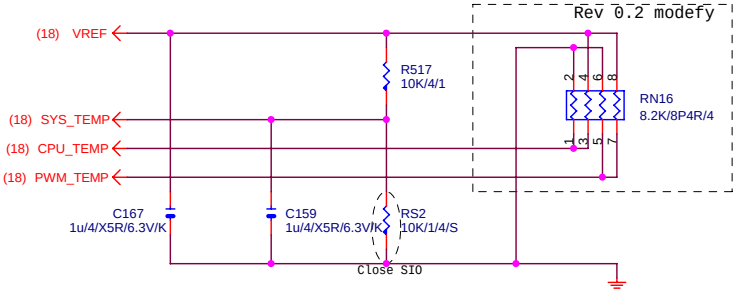
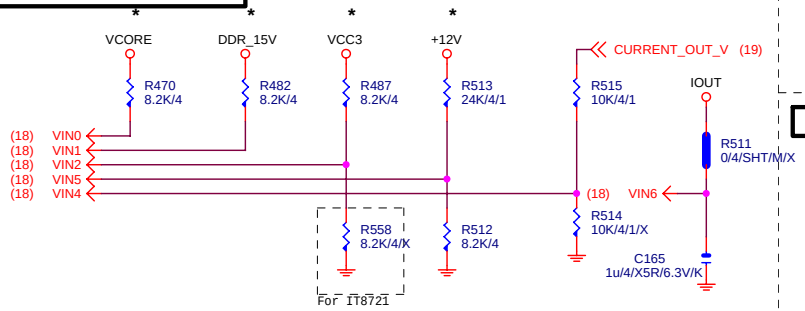
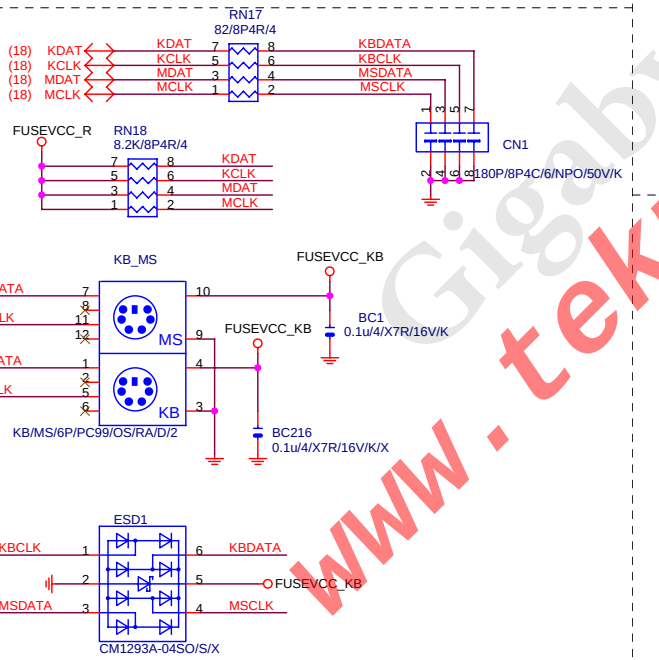
TEMP H/W MONITOR



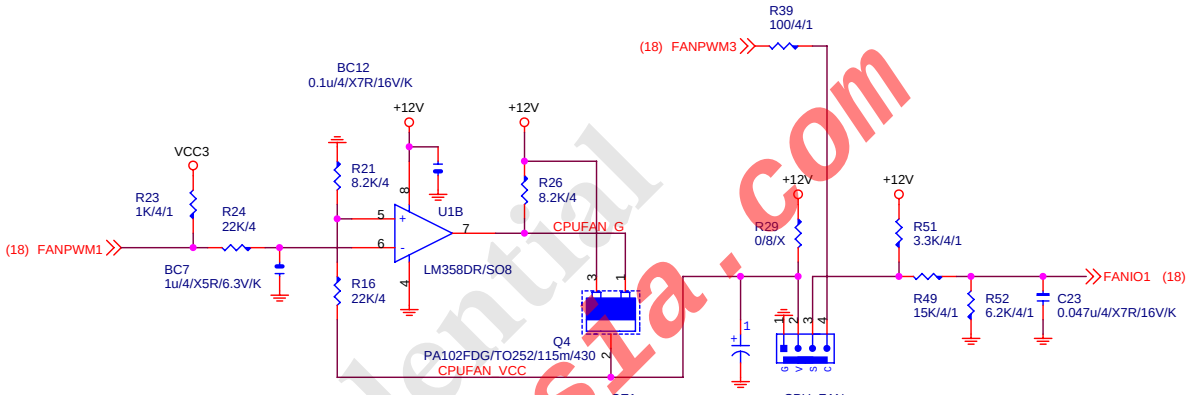
VOLTAGE-- H/W MONITOR



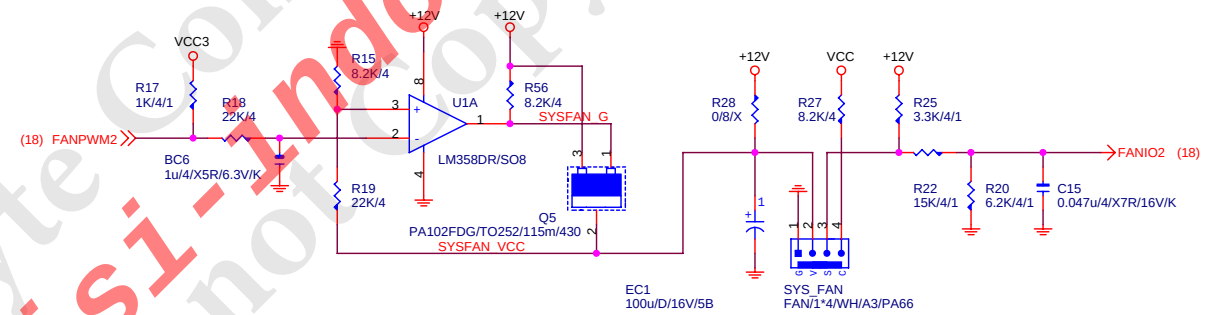
KB/USB

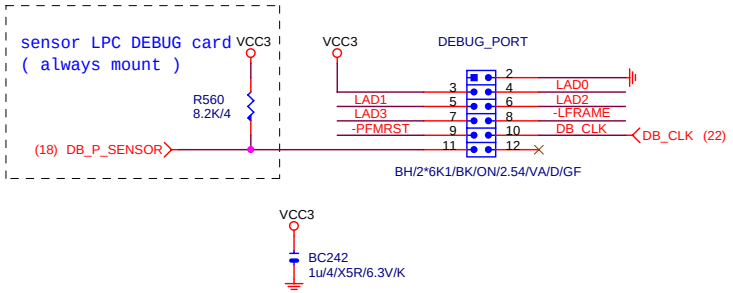


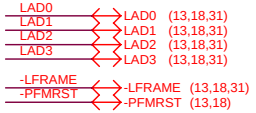
CPU SMART FAN



SYS SMART FAN Linear SYS_FAN







Gigabyte Technology		
Title: HWM,KB/MS, FAN CTRL		
Size: Custom	Document Number: GA-Q57M-S2H	Rev: 1.02
Date: Thursday, March 04, 2010	Sheet 35 of 35	