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07	CPU_LGA1150-D
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SHEET TITLE

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Gigabyte Technology

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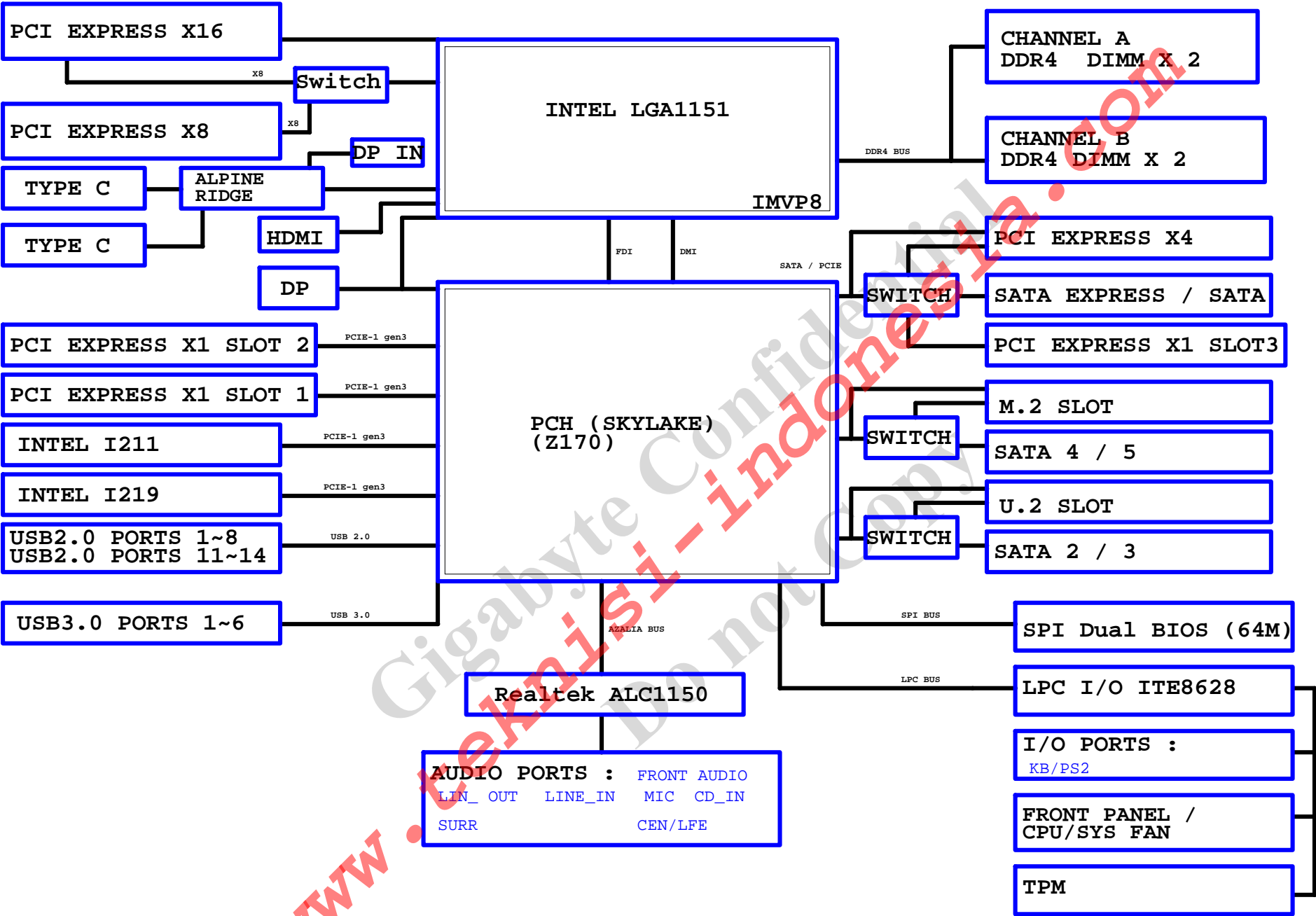
## Component value change history

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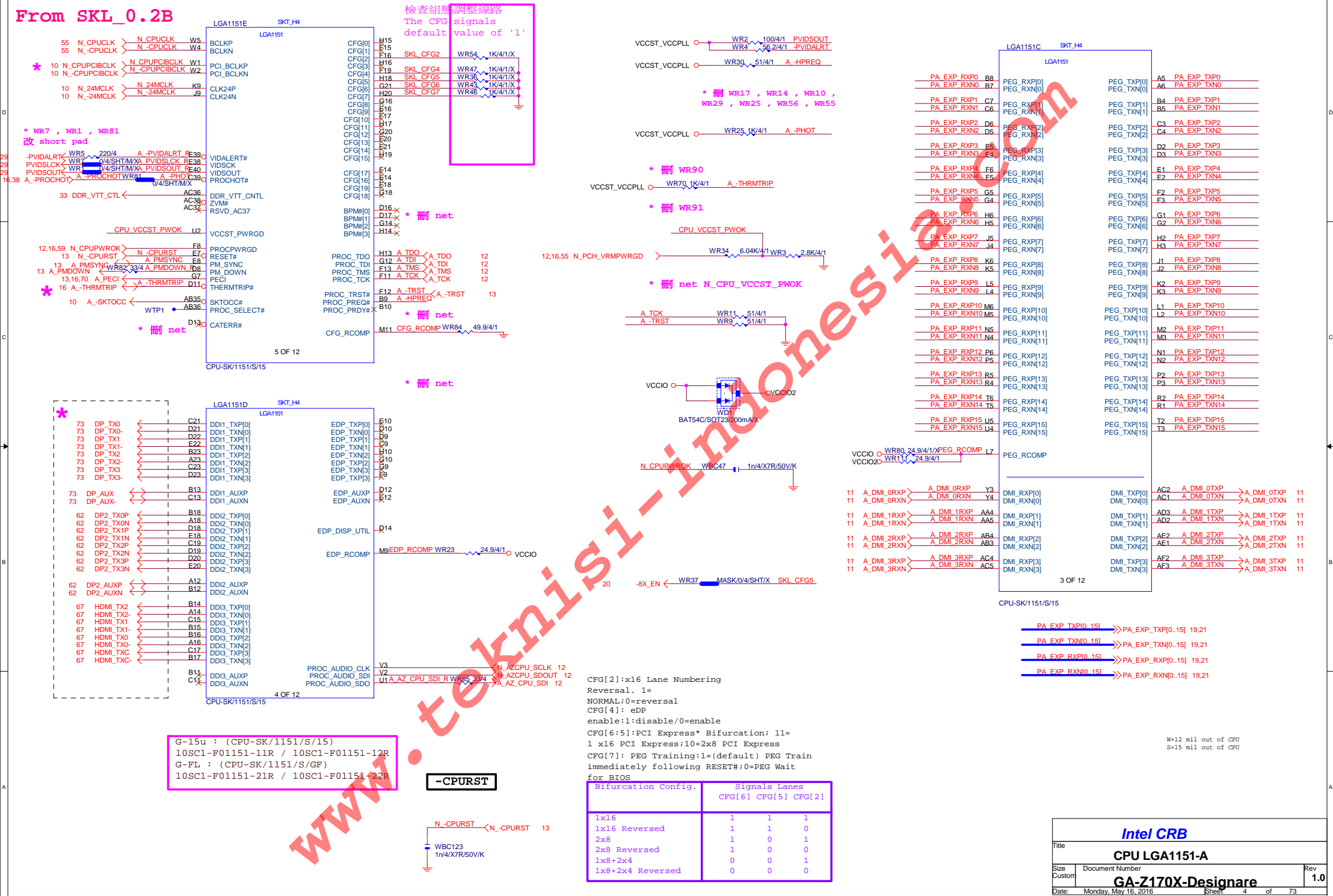
DATE	Change Item	Reason
2016/02/23	1.PCB first release	REV 0.1
2016/03/18	1. 調整Thunderbolt處的rule,由原本的4/6/4改成4/4/REV 0.2 2. 調整Thunderbolt處走線 3. 調整LED亮度.ADD PRN4.PRN5 4. LED_C的+12V走20MIL 5. THX1改SMD 6. 修改圖騰	REV 0.2
2016/04/13	1. 修改燈條控制線路 2. 修改後窗規格 LAN+USB2.0改LAN+USB3.0 HDMI+USB3.0改HDMI+DP IN 3. PCIeX16.PCIEX8 add USB訊號 4. Add WD1	REV 0.3
2016/04/29	1. 修改LED connector線路	REV 1.0

			
Title			
<b>BOM &amp; PCB MODIFY HISTORY</b>			
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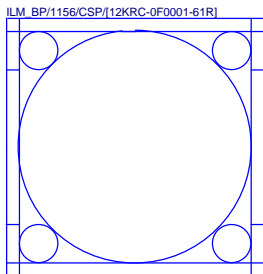
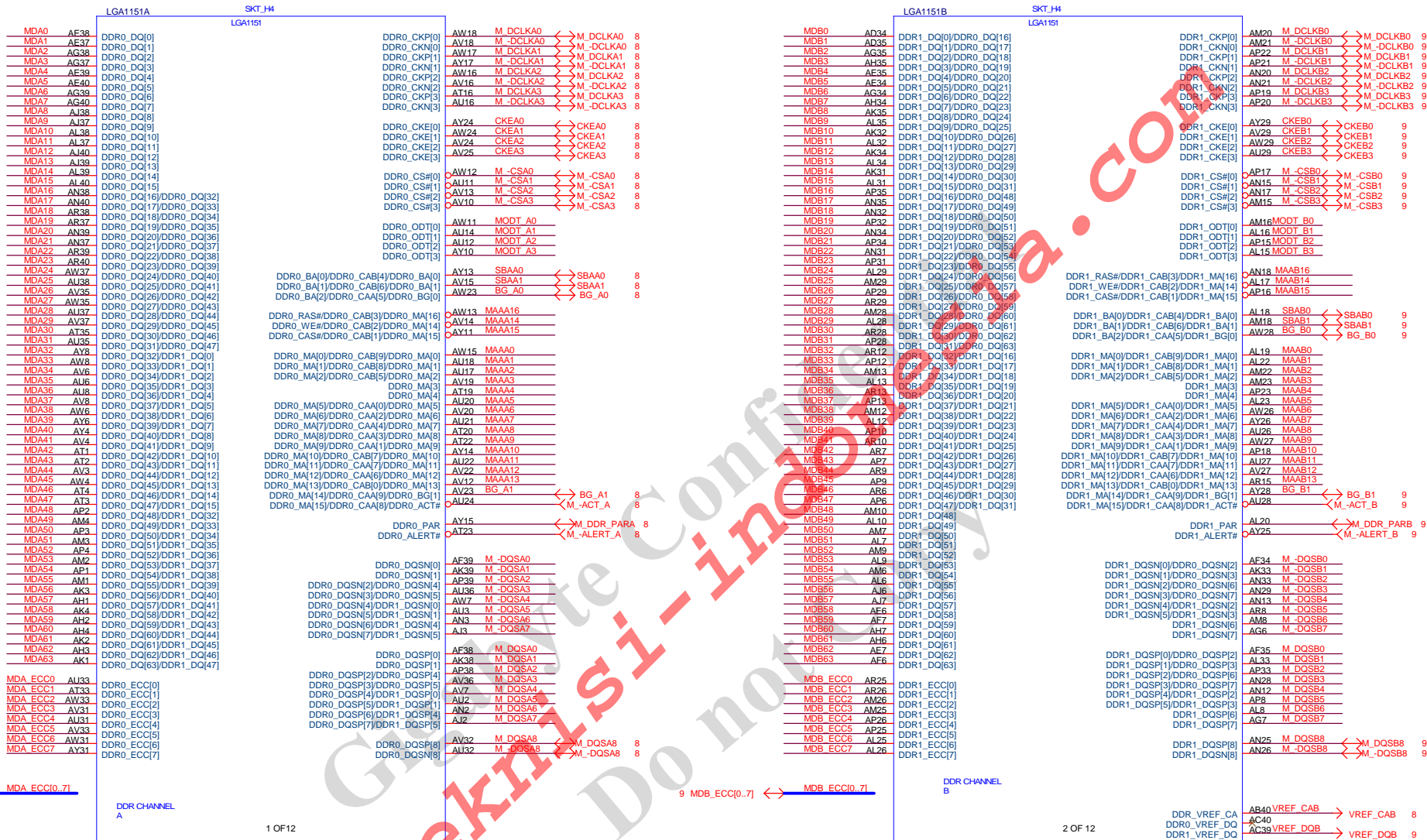
BLOCK DIAGRAM



From SKL\_0.2B



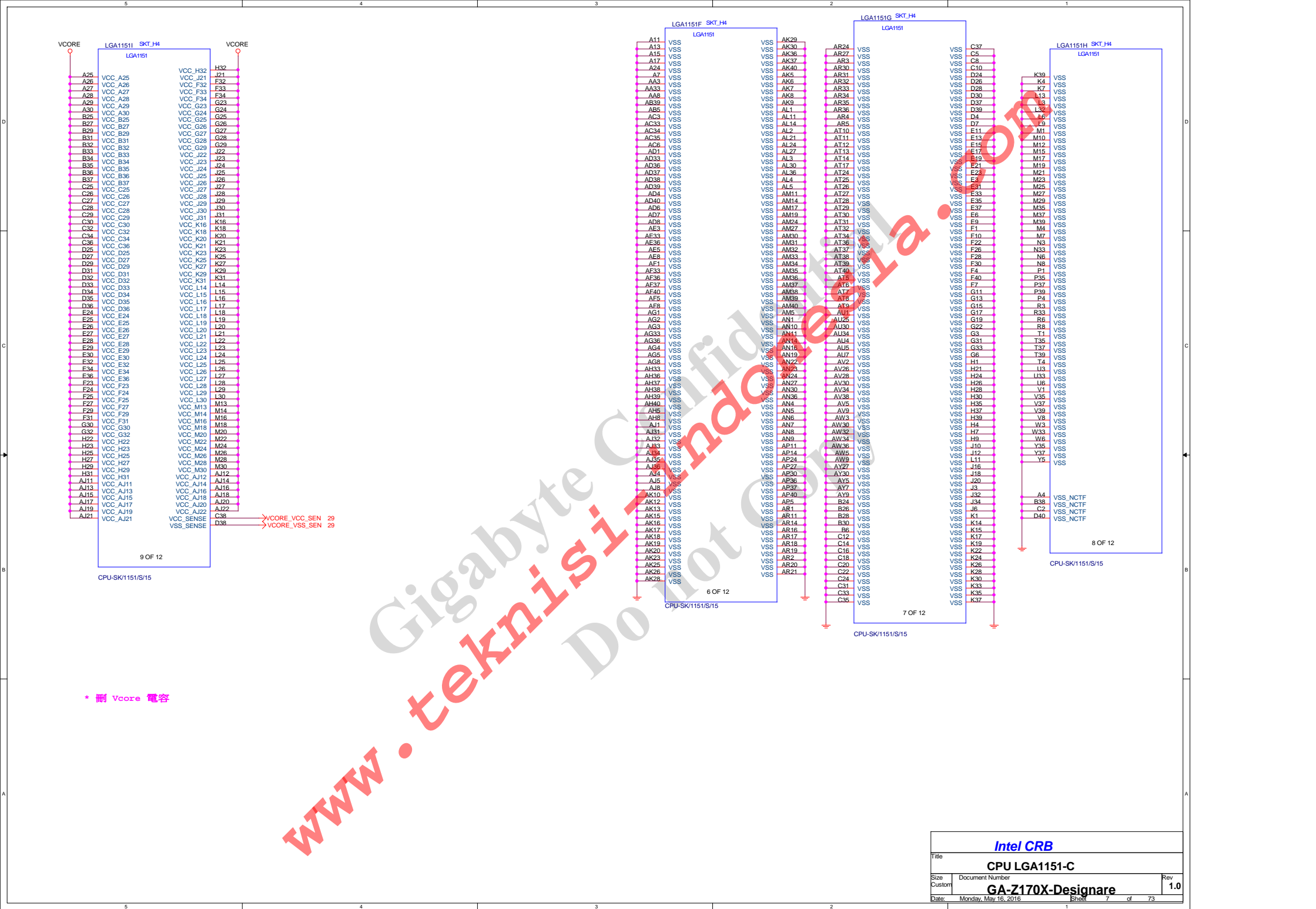
\* 改DDR4 net



Need check the new CPU ME

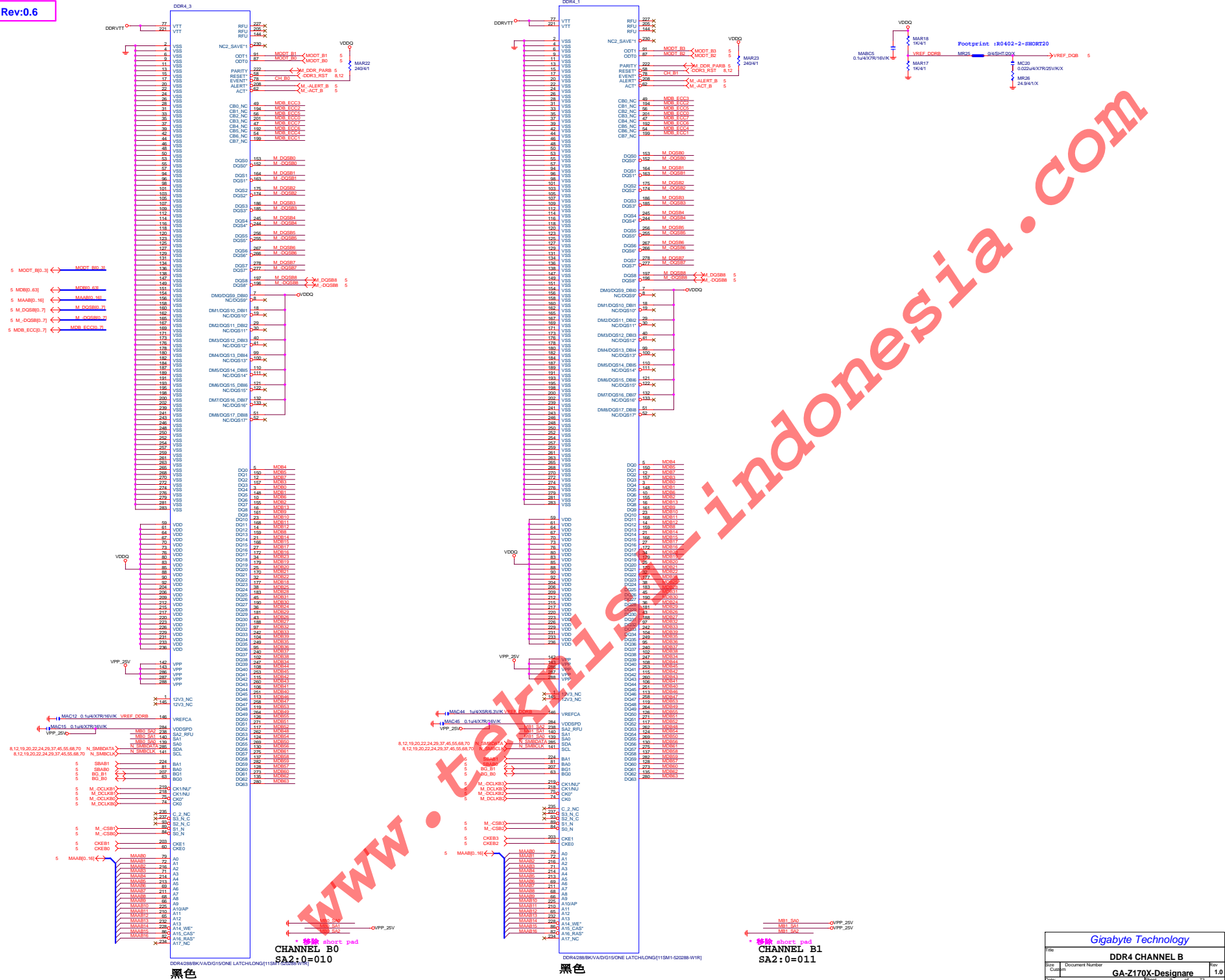










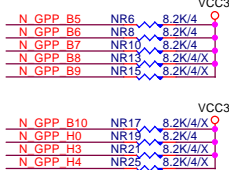
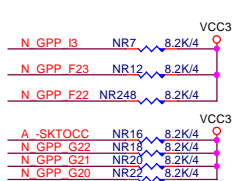
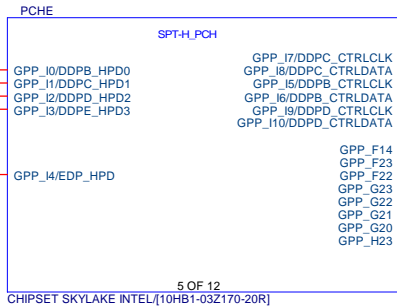


Rev 0.7

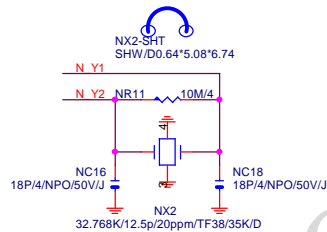
放置PCH端

N\_DDPB\_CTRLCLK NR23 2.2K/4/1  
N\_DDPB\_CTRLDATA NR24 2.2K/4/1

放置PCH端

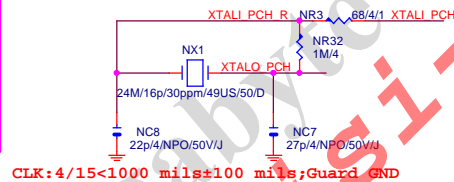
N\_DDPG\_CTRLCLK NR318 2.2K/4/1  
N\_DDPG\_CTRLDATA NR319 2.2K/4/1

32.768KHZ

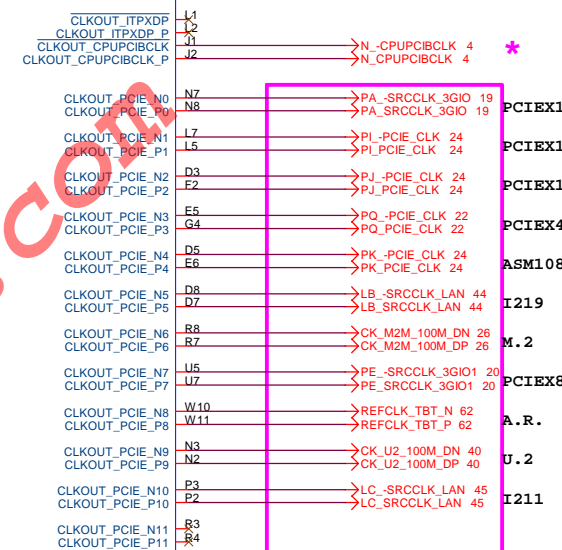
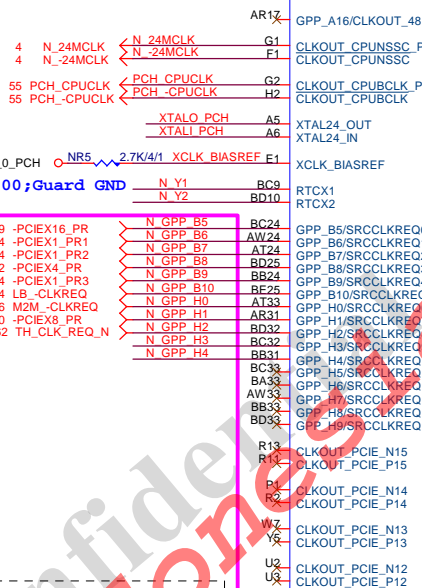


N GPP H4 NR308 0M/SHT/M/X  
N GPP H2 NR309 0M/SHT/M/X  
N GPP H3 NR286 0M/SHT/M/X  
N GPP B10 NR287 0M/SHT/M/X

ON-BOARD DEVICE USED



PCHG SPT-H\_PCH



CLOCK 4/4/4/15

Gigabyte Technology

PCH CLOCK BUFFER

GA-Z170X-Designare

Rev  
1.0

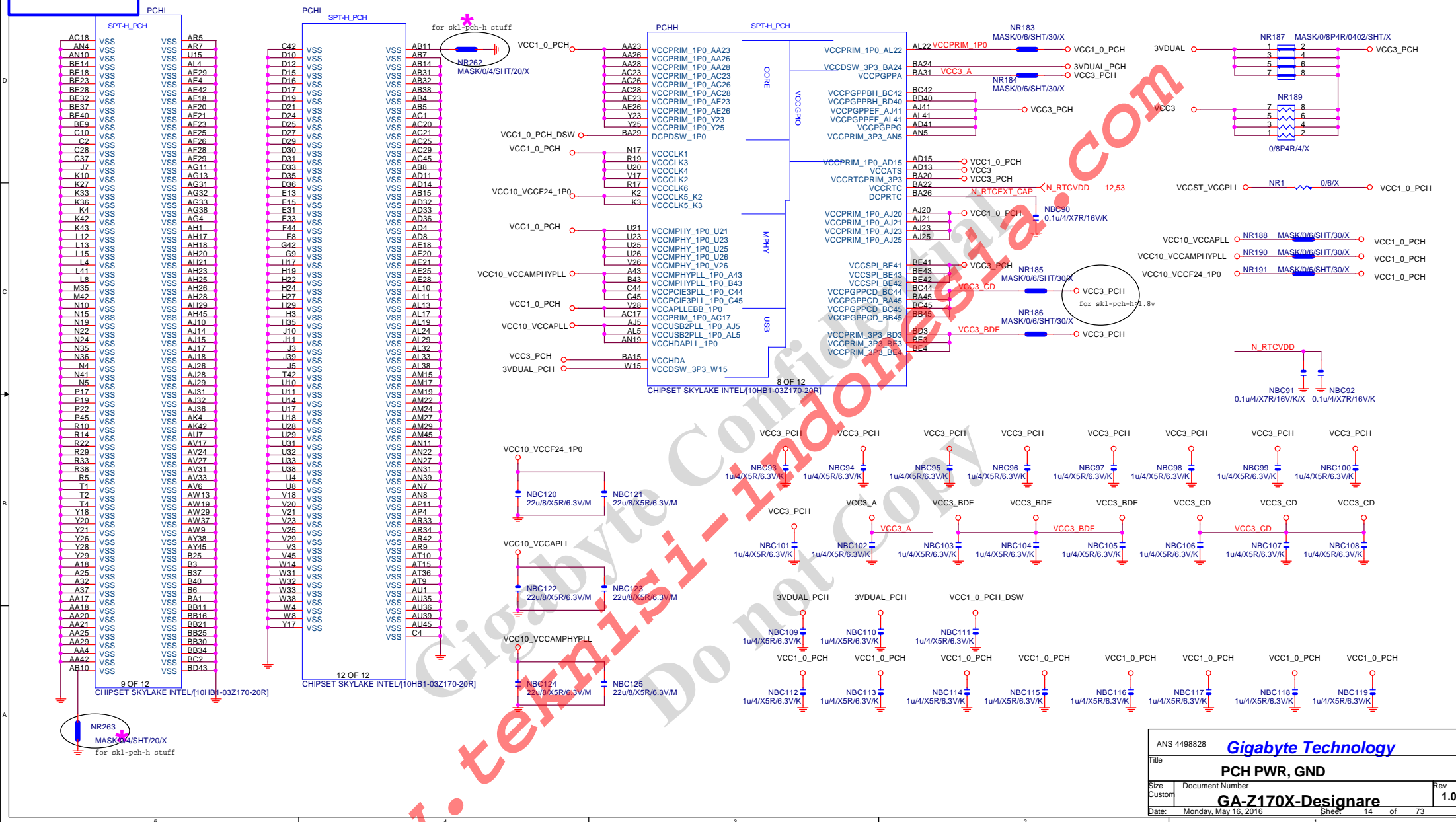
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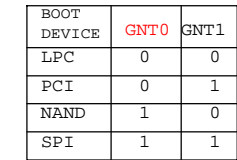




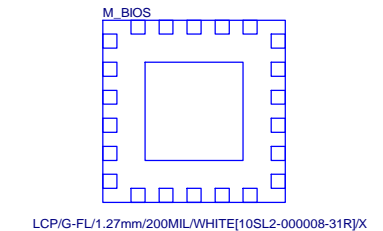




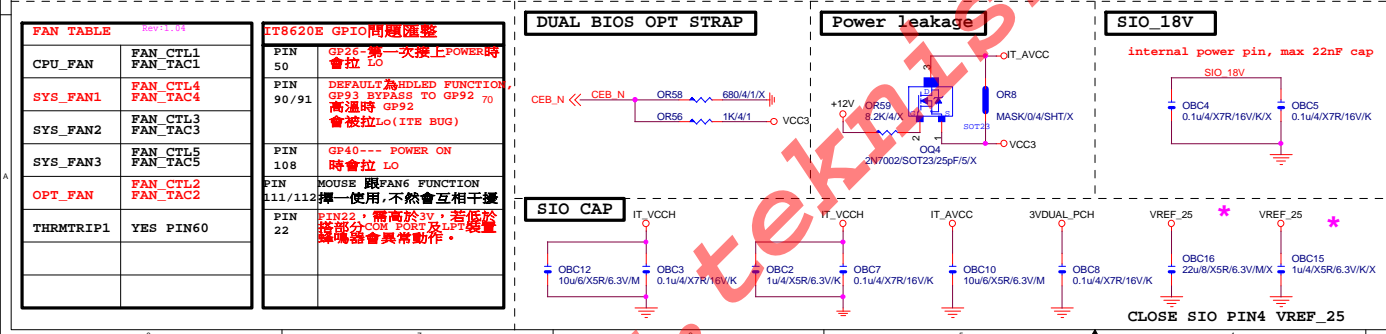
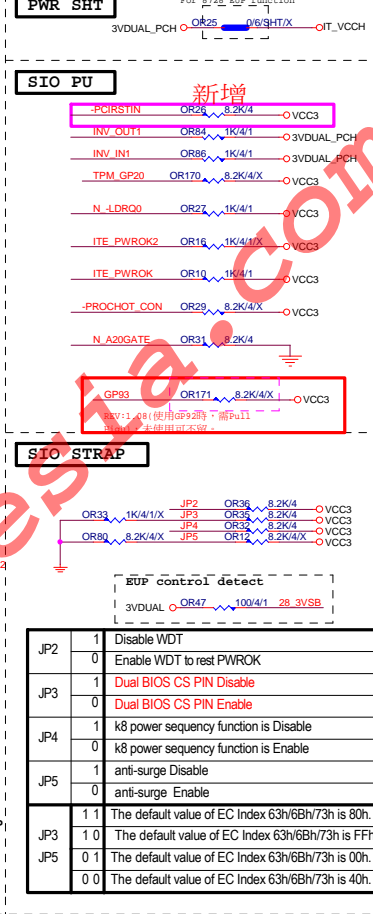




1 means floating  
0 means PD 1K



\* 試産先上 , PVT 移除

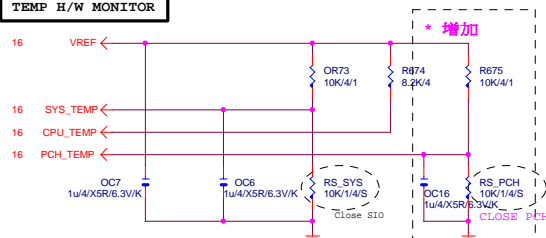


		Intel 219	組態二
Dual LAN		Atheros+Atheros	組態一
		Intel 219+Atheros	組態三
		Intel 219+Intel 210	
No Support ERP		BOM不上	N/A

A

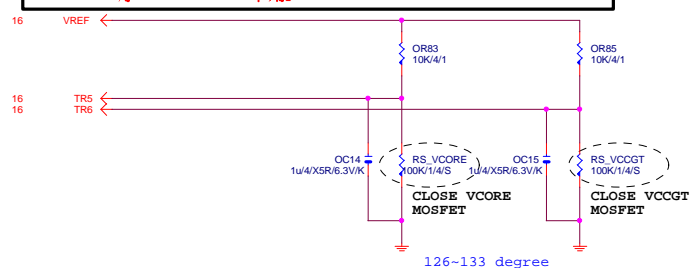
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<p>Title: <b>ITE 8620 LPC IO</b></p>			
Size	Document Number		Rev
Custom			
<h1 style="color: black;">GA-Z170X-Designate</h1>			
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## TEMP H/W MONITOR

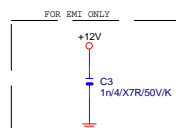
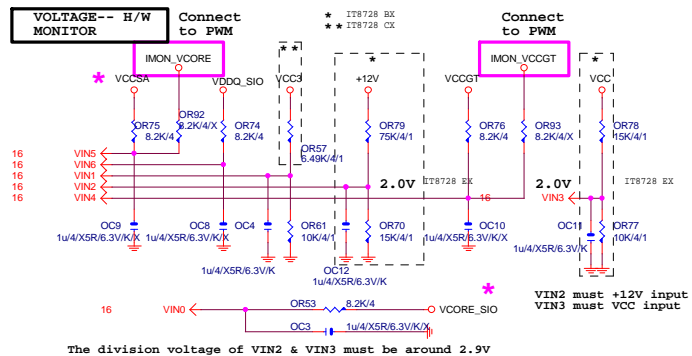


## RS\_VCORE、RS\_VCCGT、CLOSE CPU\_VCORE &amp; VCCGT MOSFET

-PROCHOT: 有mos meartsink 不用prochot function



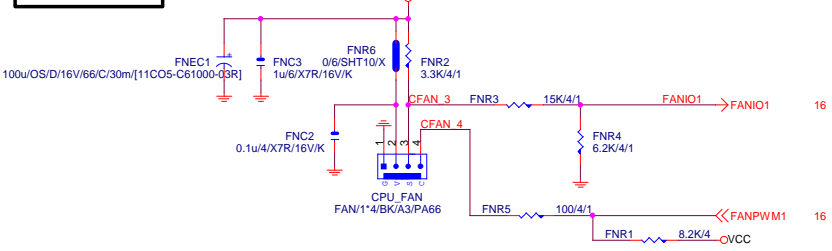
## VOLTAGE-- H/W MONITOR



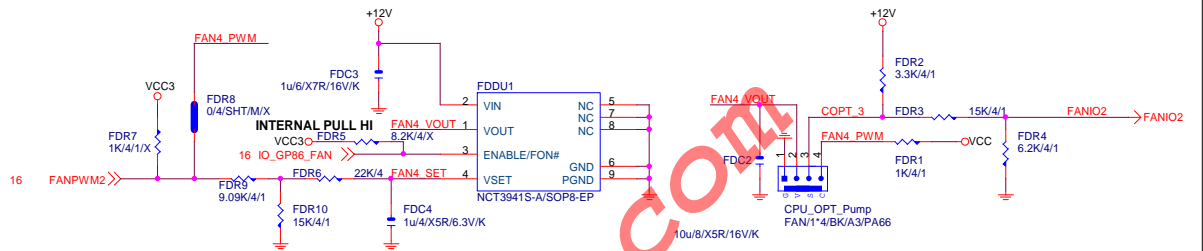
Gigabyte Technology

Title			HWM,KB/MS, FAN CTRL
Size	Document Number	Rev	
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CPU SMART FAN



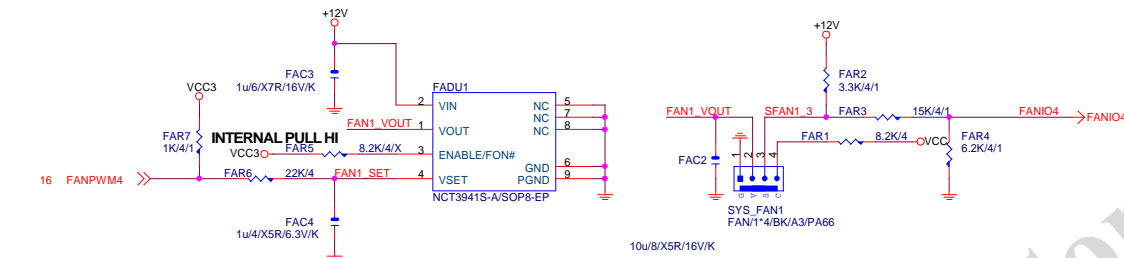
CPU\_OPT



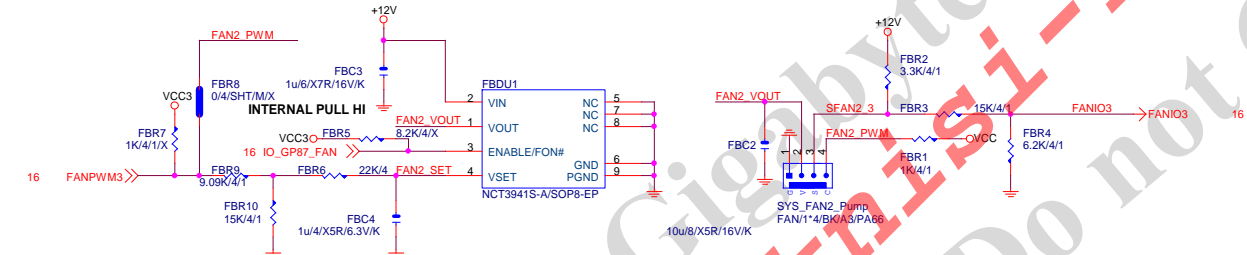
SYSTEM FAN1

Linear SYS\_FAN

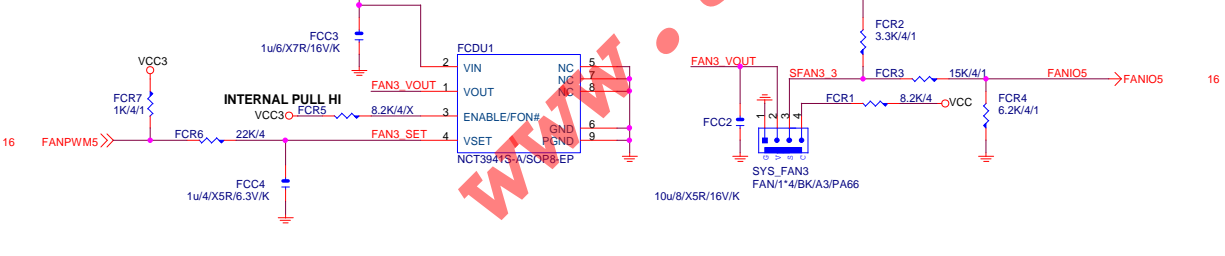
Enable Function (NCT3941S)  
Full Turn On Function (NCT3941S-A)



SYSTEM FAN2



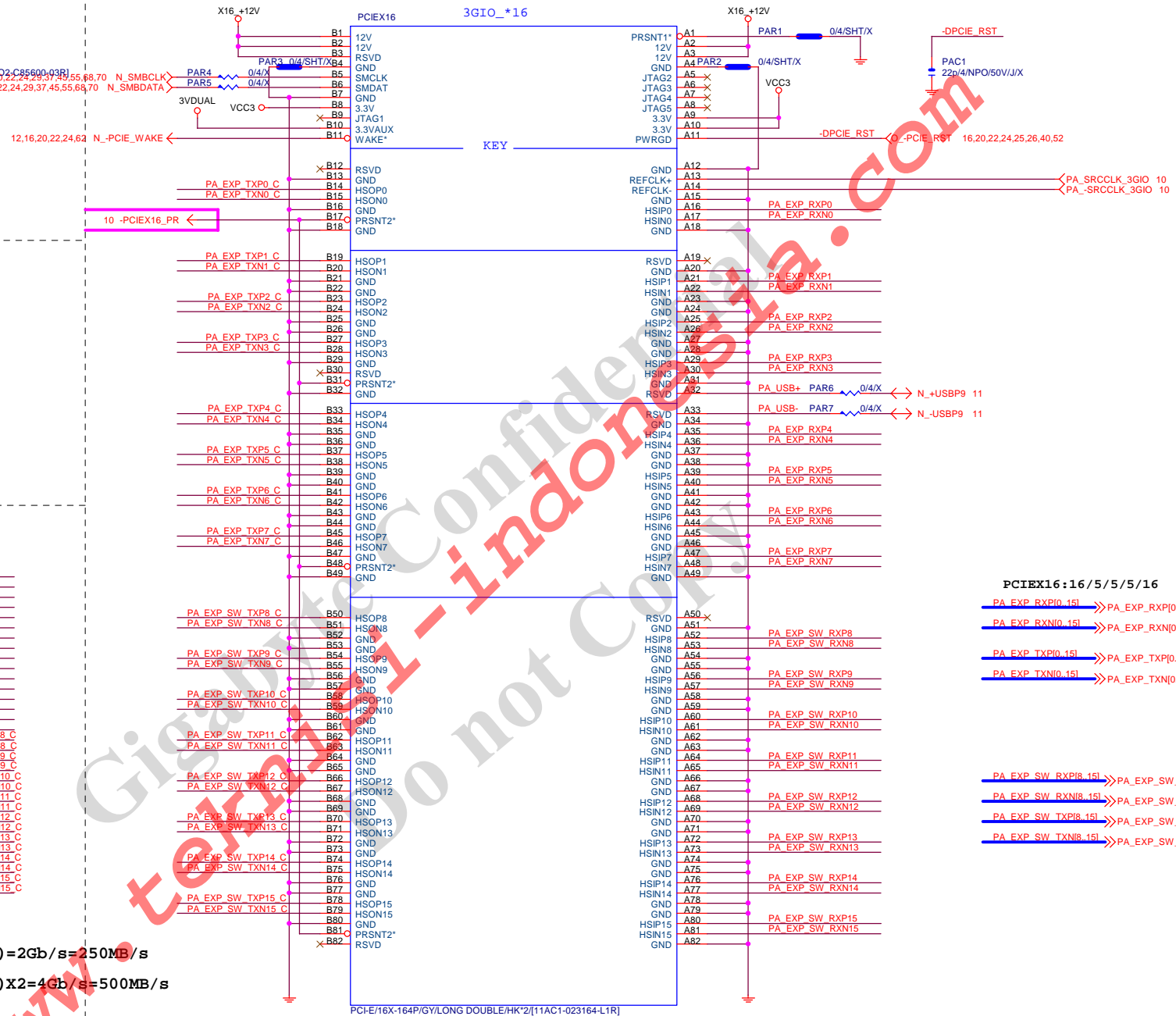
SYSTEM FAN3



PCIEX16 CAP

PCIEX16 SLOT

PCIESLOT-164STH



## PCIEX16 PROTECT SHT

PCIEX16	AC	CAP
---------	----	-----

PA EXP TPX0	PAC5	0.22u4X5R6V.3V/K	PA EXP TPX0 C
PA EXP TPX1	PAC4	0.22u4X5R6V.3V/K	PA EXP TPX0 C
PA EXP TPX1	PAC6	0.22u4X5R6V.3V/K	PA EXP TPX1 C
PA EXP TPX1	PAC7	0.22u4X5R6V.3V/K	PA EXP TPX1 C
PA EXP TPX2	PAC8	0.22u4X5R6V.3V/K	PA EXP TPX2 C
PA EXP TPX2	PAC9	0.22u4X5R6V.3V/K	PA EXP TPX2 C
PA EXP TPX3	PAC10	0.22u4X5R6V.3V/K	PA EXP TPX3 C
PA EXP TPX3	PAC11	0.22u4X5R6V.3V/K	PA EXP TPX3 C
PA EXP TPX4	PAC12	0.22u4X5R6V.3V/K	PA EXP TPX4 C
PA EXP TPX4	PAC13	0.22u4X5R6V.3V/K	PA EXP TPX4 C
PA EXP TPX5	PAC14	0.22u4X5R6V.3V/K	PA EXP TPX5 C
PA EXP TPX5	PAC15	0.22u4X5R6V.3V/K	PA EXP TPX5 C
PA EXP TPX6	PAC16	0.22u4X5R6V.3V/K	PA EXP TPX6 C
PA EXP TPX6	PAC17	0.22u4X5R6V.3V/K	PA EXP TPX6 C
PA EXP TPX7	PAC18	0.22u4X5R6V.3V/K	PA EXP TPX7 C
PA EXP TPX7	PAC19	0.22u4X5R6V.3V/K	PA EXP TPX7 C
PA EXP SW TPX8	PAC21	0.22u4X5R6V.3V/K	PA EXP SW TPX8 C
PA EXP SW TPX8	PAC20	0.22u4X5R6V.3V/K	PA EXP SW TPX8 C
PA EXP SW TPX9	PAC22	0.22u4X5R6V.3V/K	PA EXP SW TPX9 C
PA EXP SW TPX9	PAC23	0.22u4X5R6V.3V/K	PA EXP SW TPX9 C
PA EXP SW TPX10	PAC24	0.22u4X5R6V.3V/K	PA EXP SW TPX10 C
PA EXP SW TPX10	PAC25	0.22u4X5R6V.3V/K	PA EXP SW TPX10 C
PA EXP SW TPX11	PAC26	0.22u4X5R6V.3V/K	PA EXP SW TPX11 C
PA EXP SW TPX11	PAC27	0.22u4X5R6V.3V/K	PA EXP SW TPX11 C
PA EXP SW TPX12	PAC28	0.22u4X5R6V.3V/K	PA EXP SW TPX12 C
PA EXP SW TPX12	PAC29	0.22u4X5R6V.3V/K	PA EXP SW TPX12 C
PA EXP SW TPX13	PAC30	0.22u4X5R6V.3V/K	PA EXP SW TPX13 C
PA EXP SW TPX13	PAC31	0.22u4X5R6V.3V/K	PA EXP SW TPX13 C
PA EXP SW TPX14	PAC32	0.22u4X5R6V.3V/K	PA EXP SW TPX14 C
PA EXP SW TPX14	PAC33	0.22u4X5R6V.3V/K	PA EXP SW TPX14 C
PA EXP SW TPX15	PAC34	0.22u4X5R6V.3V/K	PA EXP SW TPX15 C
PA EXP SW TPX15	PAC35	0.22u4X5R6V.3V/K	PA EXP SW TPX15 C

PCIEX16:16/5/5/5/16

PA EXP RXP[0..15] >> PA EXP RXP[0..15] 4.21

PA\_EXP\_RXN[0..15] >> PA\_EXP\_RXN[0..15] 4,21

PA\_EXP\_TXP[0..15] >> PA\_EXP\_TXP[0..15] 4,21

PA\_EXP\_TXN[0..15] >> PA\_EXP\_TXN[0..15] 4,21

PA EXP SW RXP[8..15] >> PA EXP SW RXP[8..15] 21

PA\_EXP\_SW\_RXN[8..15] >> PA\_EXP\_SW\_RXN[8..15] 21

PA\_EXP\_SW\_TXP[8..15] >> PA\_EXP\_SW\_TXP[8..15] 21

PA EXP SW TXN[8..15] >> PA\_EXP\_SW\_TXN[8..15] 21

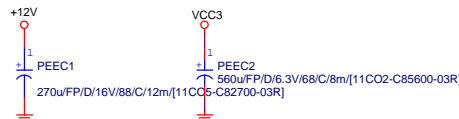
PCI-E REV:2.0--&gt; 5GHZ

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## Gigabyte Technology

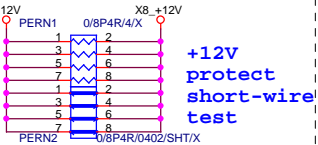
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PCI EXPRESS * 16			
Size Custom	Document Number		Rev
	GA-Z170X-Designare		1.0
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Rev 0.3

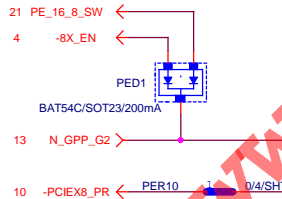
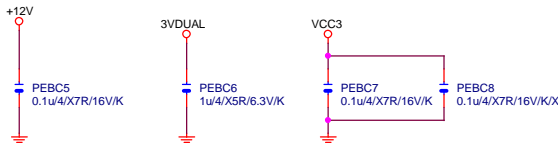


8,9,12,19,22,24,29,37,45,55,68,70 N\_SMBCLK N\_SMBCLK PER8 0/4/X  
8,9,12,19,22,24,29,37,45,55,68,70 N\_SMBDATA N\_SMBDATA PER9 0/4/X

### PCIEX8 PROTECT SHT

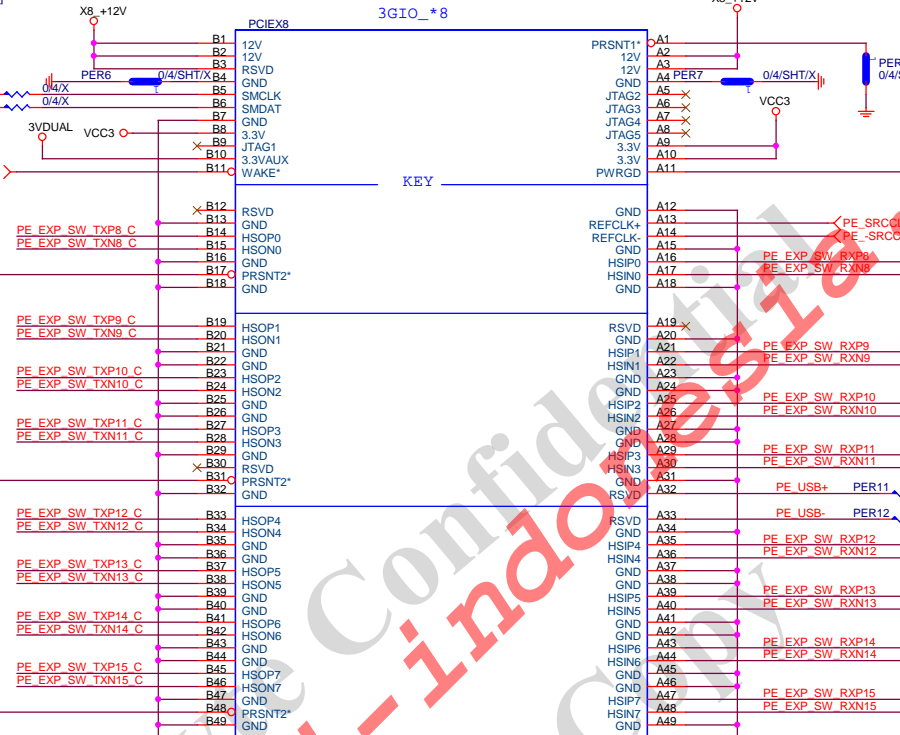


+12V  
protect  
short-wire  
test



### PCIEX8

3GIO\_\*8



PCI-E/8X-99P/GY/LONG DOUBLE/HK\*2/[11AC1-023099-F1R]

黑色

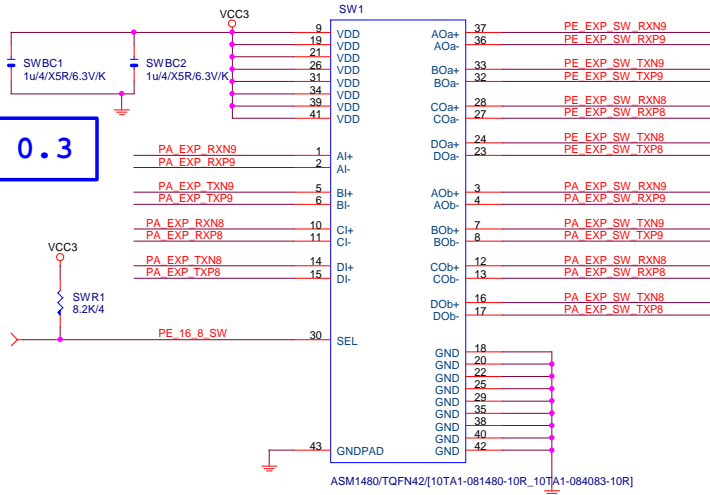
PE EXP SW TXP8	PEC7	0.22u4/X5R/6.3V/K	PE EXP SW TXP8_C
PE EXP SW TXN8	PEC8	0.22u4/X5R/6.3V/K	PE EXP SW TXN8_C
PE EXP SW TXP9	PEC9	0.22u4/X5R/6.3V/K	PE EXP SW TXP9_C
PE EXP SW TXN9	PEC10	0.22u4/X5R/6.3V/K	PE EXP SW TXN9_C
PE EXP SW TXP10	PEC11	0.22u4/X5R/6.3V/K	PE EXP SW TXP10_C
PE EXP SW TXN10	PEC12	0.22u4/X5R/6.3V/K	PE EXP SW TXN10_C
PE EXP SW TXP11	PEC13	0.22u4/X5R/6.3V/K	PE EXP SW TXP11_C
PE EXP SW TXN11	PEC14	0.22u4/X5R/6.3V/K	PE EXP SW TXN11_C
PE EXP SW TXP12	PEC15	0.22u4/X5R/6.3V/K	PE EXP SW TXP12_C
PE EXP SW TXN12	PEC16	0.22u4/X5R/6.3V/K	PE EXP SW TXN12_C
PE EXP SW TXP13	PEC17	0.22u4/X5R/6.3V/K	PE EXP SW TXP13_C
PE EXP SW TXN13	PEC18	0.22u4/X5R/6.3V/K	PE EXP SW TXN13_C
PE EXP SW TXP14	PEC19	0.22u4/X5R/6.3V/K	PE EXP SW TXP14_C
PE EXP SW TXN14	PEC20	0.22u4/X5R/6.3V/K	PE EXP SW TXN14_C
PE EXP SW TXP15	PEC21	0.22u4/X5R/6.3V/K	PE EXP SW TXP15_C
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Gigabyte Technology

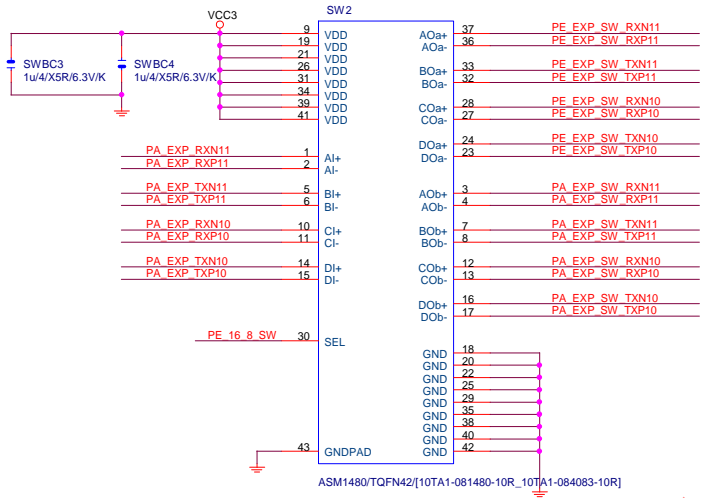
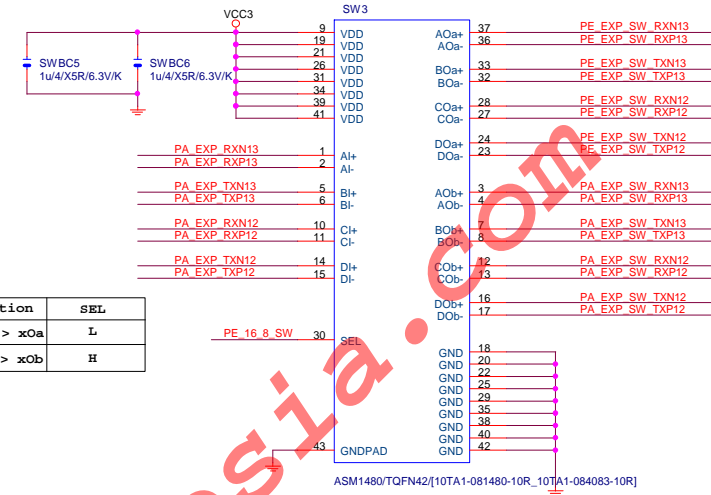
Title				PCI EXPRESS X8	
Size				GA-Z170X-Designare	
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Rev 0.3



Function	SEL
xI--> xOa	L
xI--> xOb	H



PA EXP SW RXP18.15] >>> PA\_EXP\_SW\_RXP18.15] 19

PA EXP SW RXN8.15] >>> PA\_EXP\_SW\_RXN8.15] 19

PA EXP SW TXP18.15] >>> PA\_EXP\_SW\_TXP18.15] 19

PA EXP SW TXN8.15] >>> PA\_EXP\_SW\_TXN8.15] 19

PE EXP SW RXP18.15] >>> PE\_EXP\_SW\_RXP18.15] 20

PE EXP SW RXN8.15] >>> PE\_EXP\_SW\_RXN8.15] 20

PE EXP SW TXP18.15] >>> PE\_EXP\_SW\_TXP18.15] 20

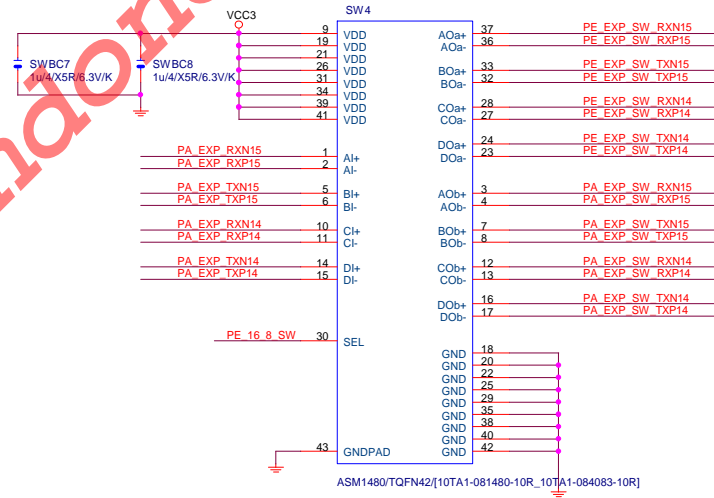
PE EXP SW TXN8.15] >>> PE\_EXP\_SW\_TXN8.15] 20

PA EXP RXP10.15] >>> PA\_EXP\_RXP10.15] 4,19

PA EXP RXN10.15] >>> PA\_EXP\_RXN10.15] 4,19

PA EXP TXP10.15] >>> PA\_EXP\_TXP10.15] 4,19

PA EXP TXN10.15] >>> PA\_EXP\_TXN10.15] 4,19



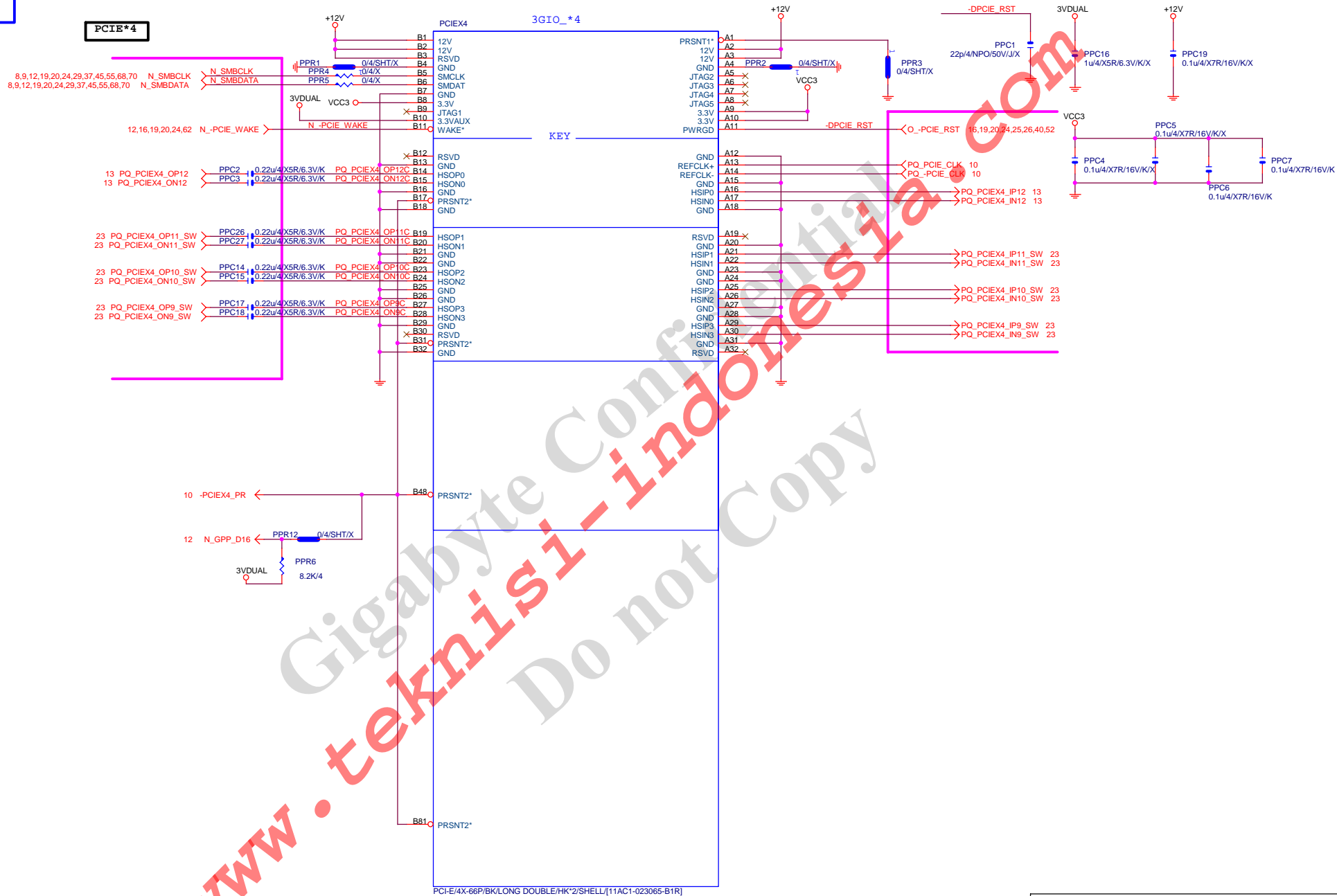
Gigabyte Technology

PCI EXPRESS X16 SWITCH

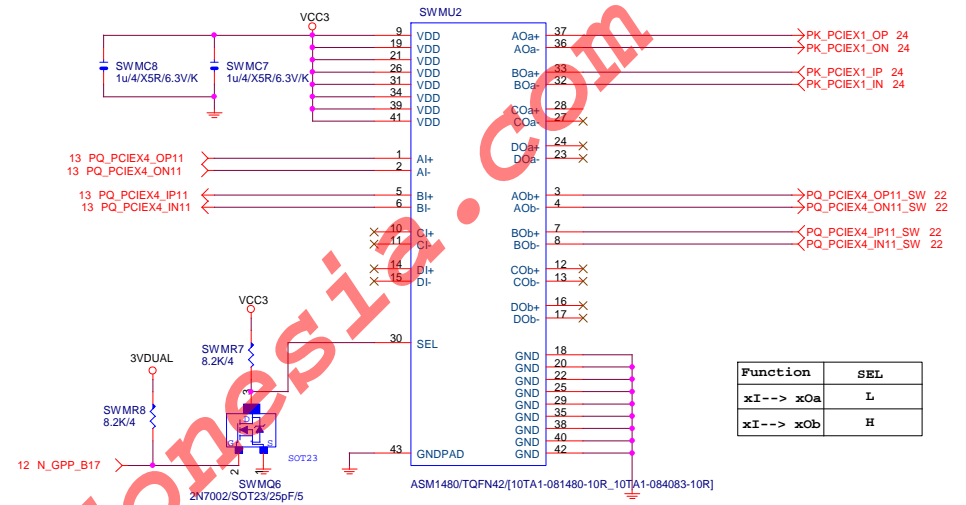
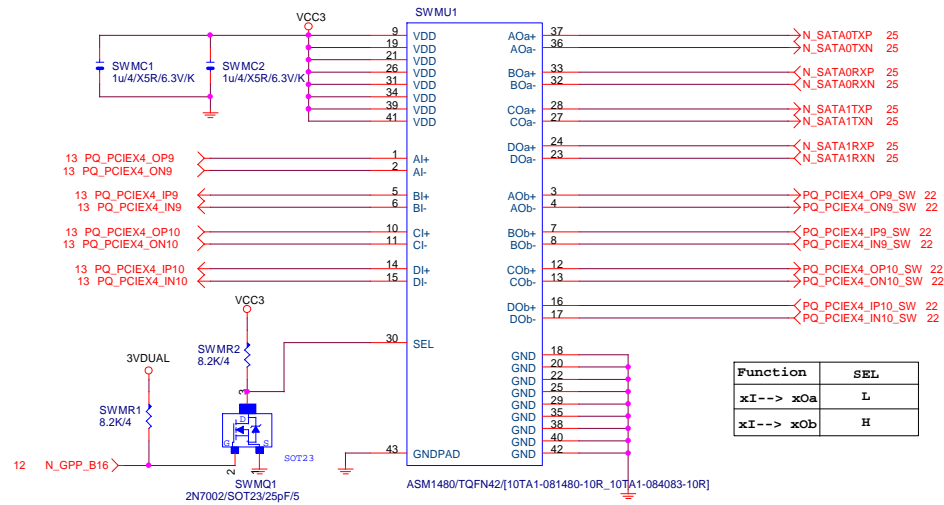
Title	Document Number	Rev
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Rev 0.2

Footprint "PCIESLOT-64STH-1"

**GIGABYTE**

Title			
PCIE X4			
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S.E (N_GPP_B15)	PCIEX4 (N_GPP_D16)	PCIEX1 (N_GPP_G3)	X4 SW (N_GPP_B16)	X1 SW (N_GPP_B17)	P9	P10	P11	P12
LOW	LOW	LOW	HIGH	HIGH	S0	S1	X1	X1
LOW	LOW	HIGH	HIGH	LOW	S0	S1	X2	
LOW	HIGH	LOW	HIGH	HIGH	S0	S1	X1	X1
LOW	HIGH	HIGH	HIGH	HIGH	S0	S1	X1	X1
HIGH	LOW	LOW	HIGH	HIGH	S0	S1	X1	X1
HIGH	LOW	HIGH	LOW	LOW	X4			
HIGH	HIGH	LOW	HIGH	HIGH	S0	S1	X1	X1
HIGH	HIGH	HIGH	HIGH	HIGH	S0	S1	X1	X1

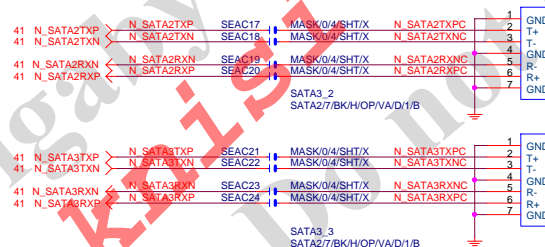
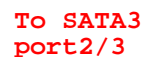
Gigabyte Technology SWITCH			
Title			
Size Custom	Document Number GA-Z170X-Designare		Rev 1.0
Date	Monday, May 16, 2016	Sheet	23 of 73





單層+2SATA:11NR6-C10236-03R

單層: 11NR6-C10118-03R



**GIGABYTE Technology**

## SATA EXPRESS

Size	Document Number	Rev
Custom	<b>GA-Z170X-Designare</b>	<b>1.0</b>
Date:	Monday, May 16, 2016	Sheet 25 of 73

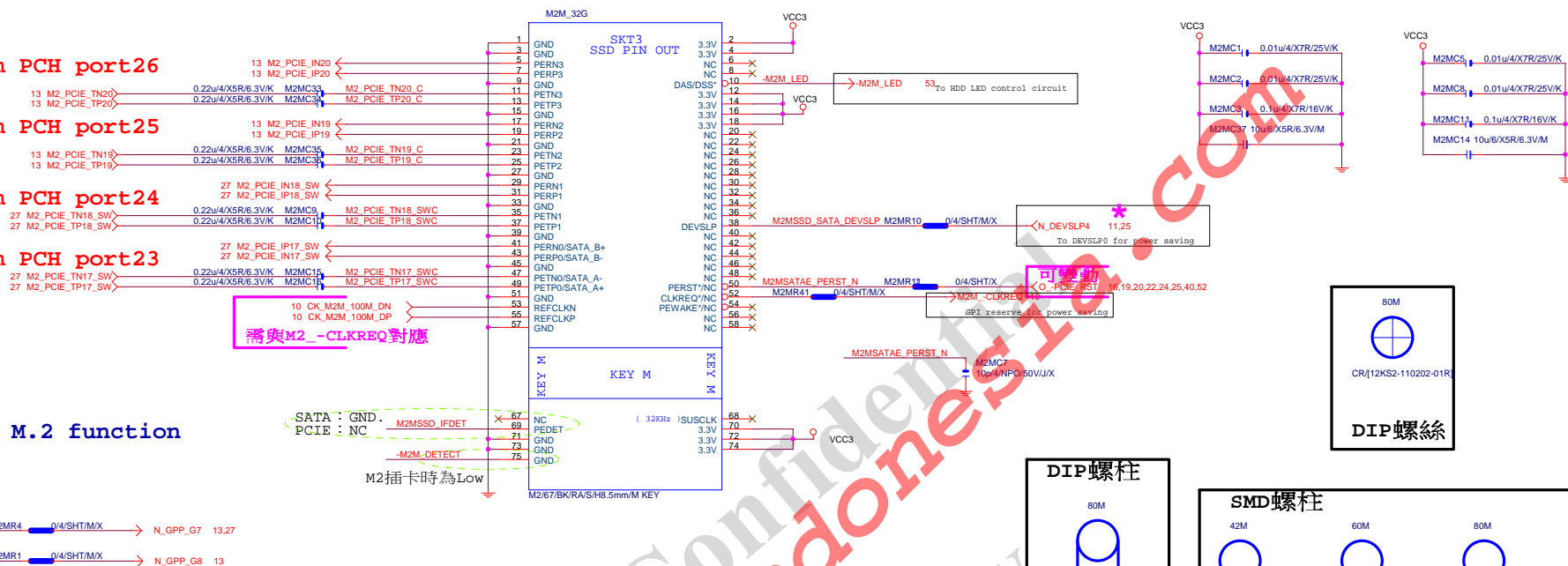
Rev 0.1

M.2 Lane4 from PCH port26

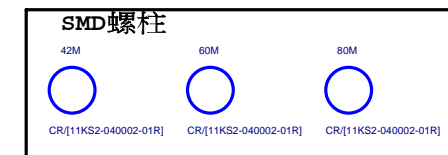
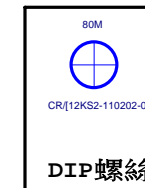
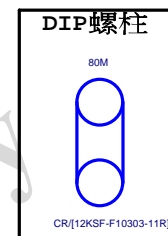
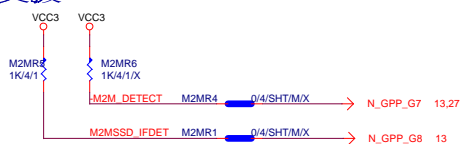
M.2 Lane3 from PCH port25

**M.2 Lane2 from PCH port24**

M.2 Lane2 from PCH port23



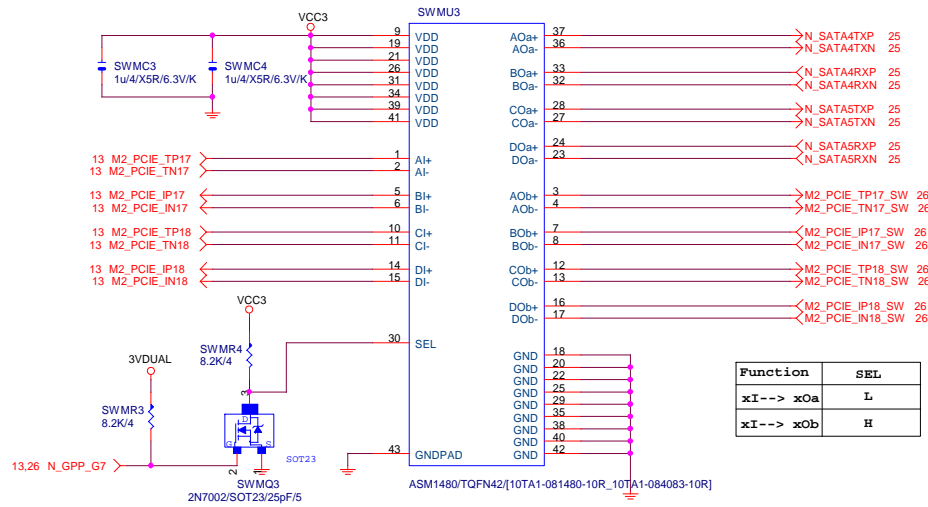
支援SATA and M.2 function

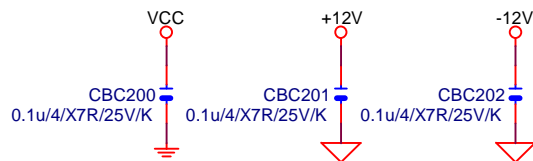




Rev 0.1

(M)TYPE





Gigabyte Technology

Title

ASM1085 POWER

Size  
Custom

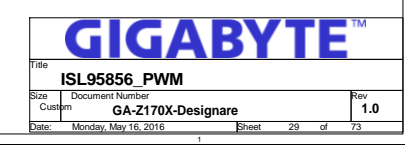
Document Number

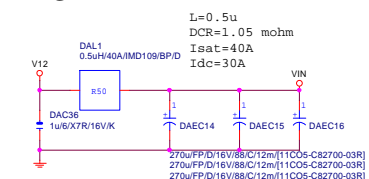
GA-Z170X-Designare

Rev  
1.0

Date: Monday, May 16, 2016

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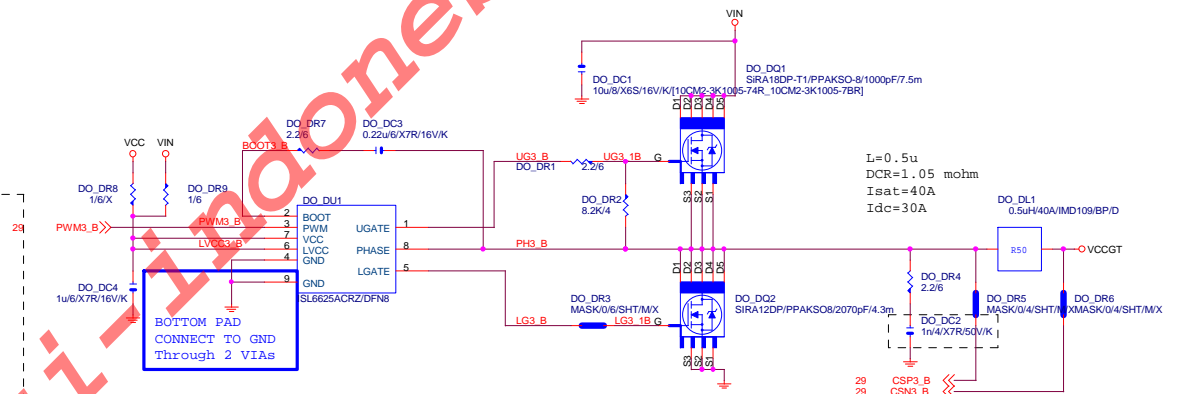
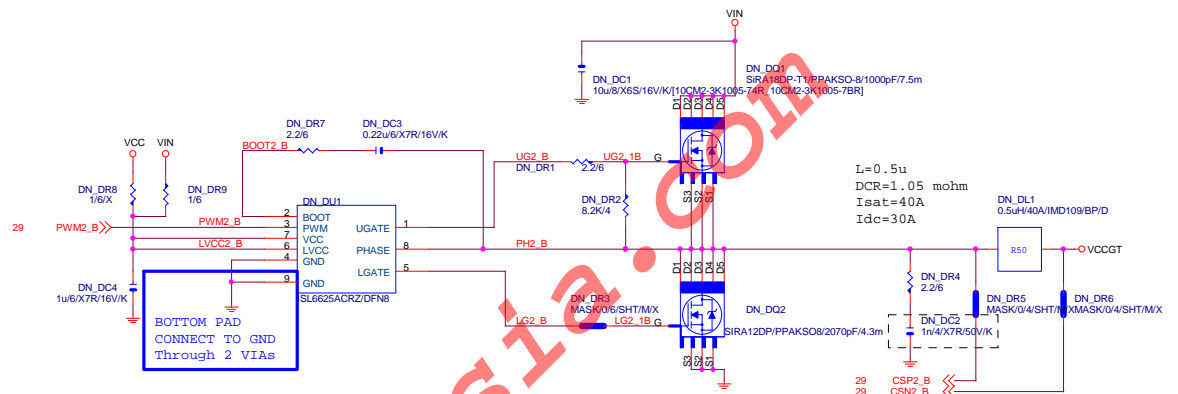
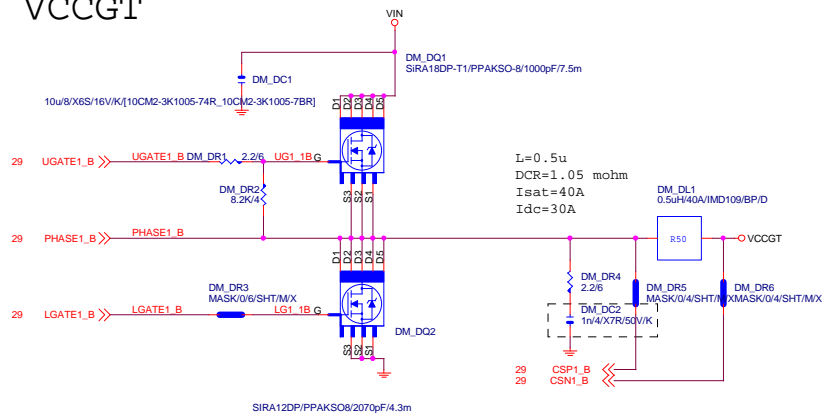
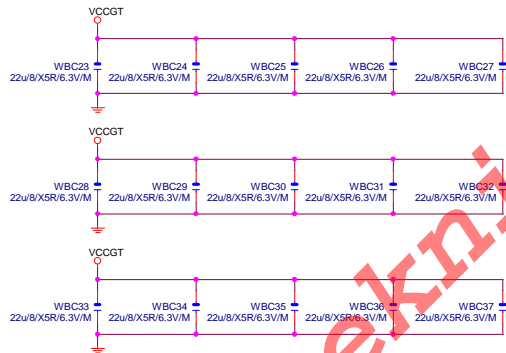
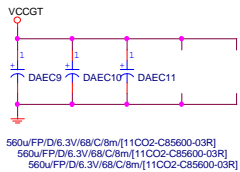




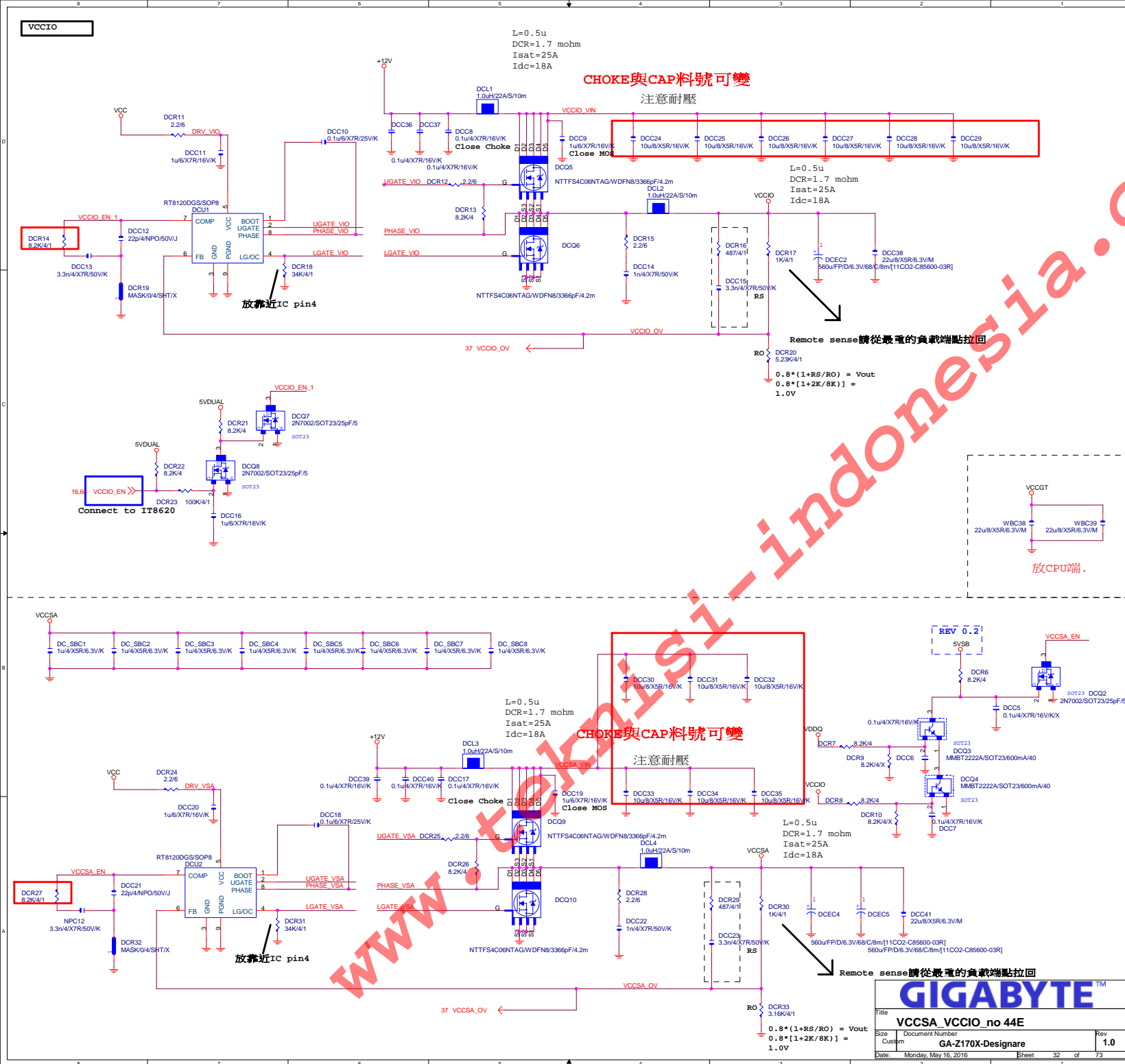
# GIGABYTE™

Title			
ISL95856_MOS			
Size	Document Number	Rev	
Custom	GA-Z170X-Designare	1.0	
Date:	Monday, May 16, 2016	Sheet	30 of 73

## VCCGT

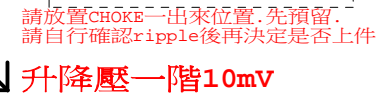
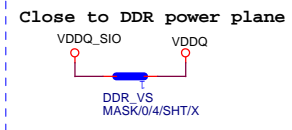
VCCGT CAP 560u\*3PCS  
22u\*15PCS

GIGABYTE™			
Title			
ISL95856 MOS			
Size	Document Number	Rev	
Custom	GA-Z170X-Designare	1.0	
Date:	Monday, May 16, 2016	Sheet	31 of 73

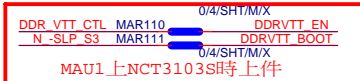




## DDR4



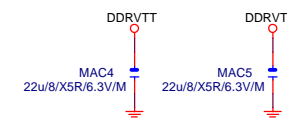
For power sequence require



\* 大電容 x0

MAC4 22uF/8X5R/6.3V/M

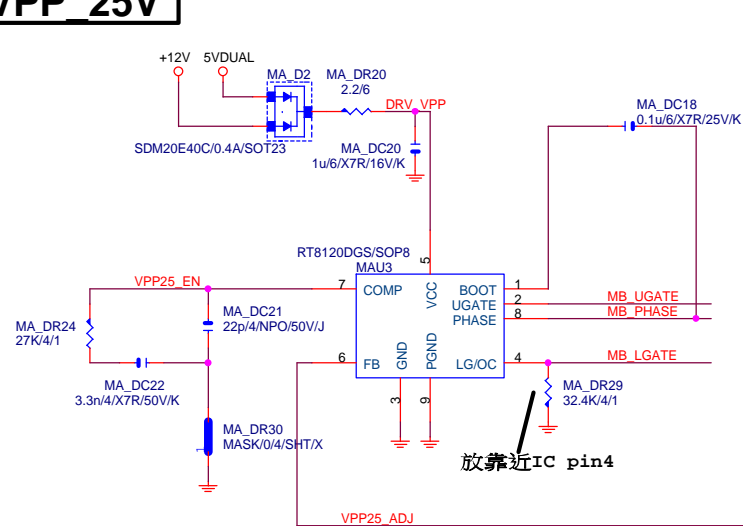
MAC5 22uF/8X5R/6.3V/M

**GIGABYTE™**

Title			
RT8120_ DDR4 POWER			
Size	Document Number	Rev	
Custom	GA-Z170X-Designare	1.0	
Date:	Monday, May 16, 2016	Sheet	33 of 73

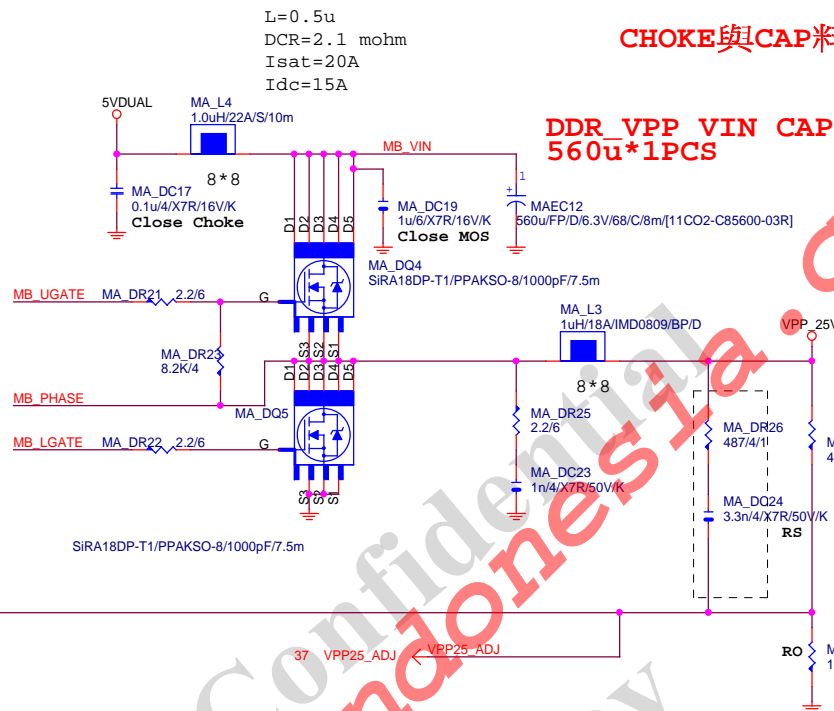
REV:0.83

VPP\_25V



放靠近IC pin4

VPP25\_ADJ



CHOKE與CAP料號可變

DDR\_VPP VIN CAP  
560u\*1PCS

L=0.5u  
DCR=2.1 mohm  
Isat=20A  
Idc=15A

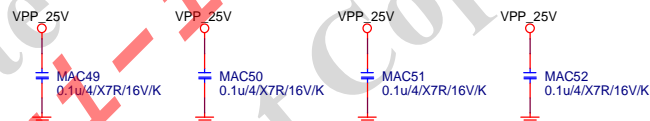
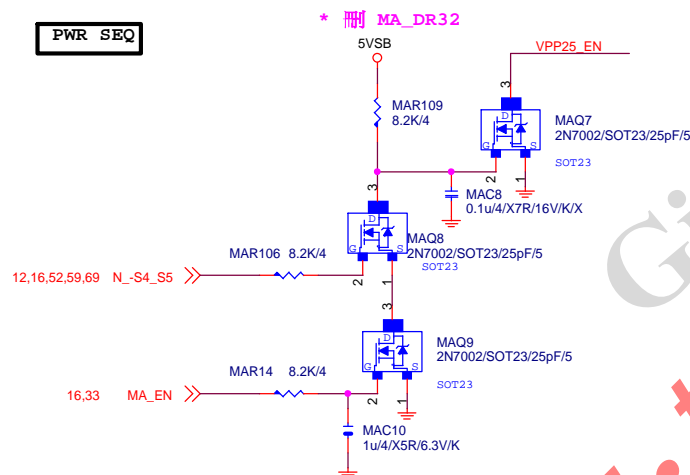
SUPPORT DDR4 2.5V

25A MAX

請放置CHOKE一出來位置.先預留.  
請自行確認ripple後再決定是否上件

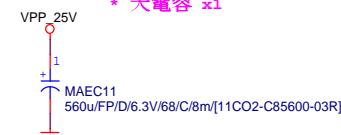
Remote sense請從最重的負載端點拉回

PWR\_SEQ



VPP CAP 560u\*1PCS

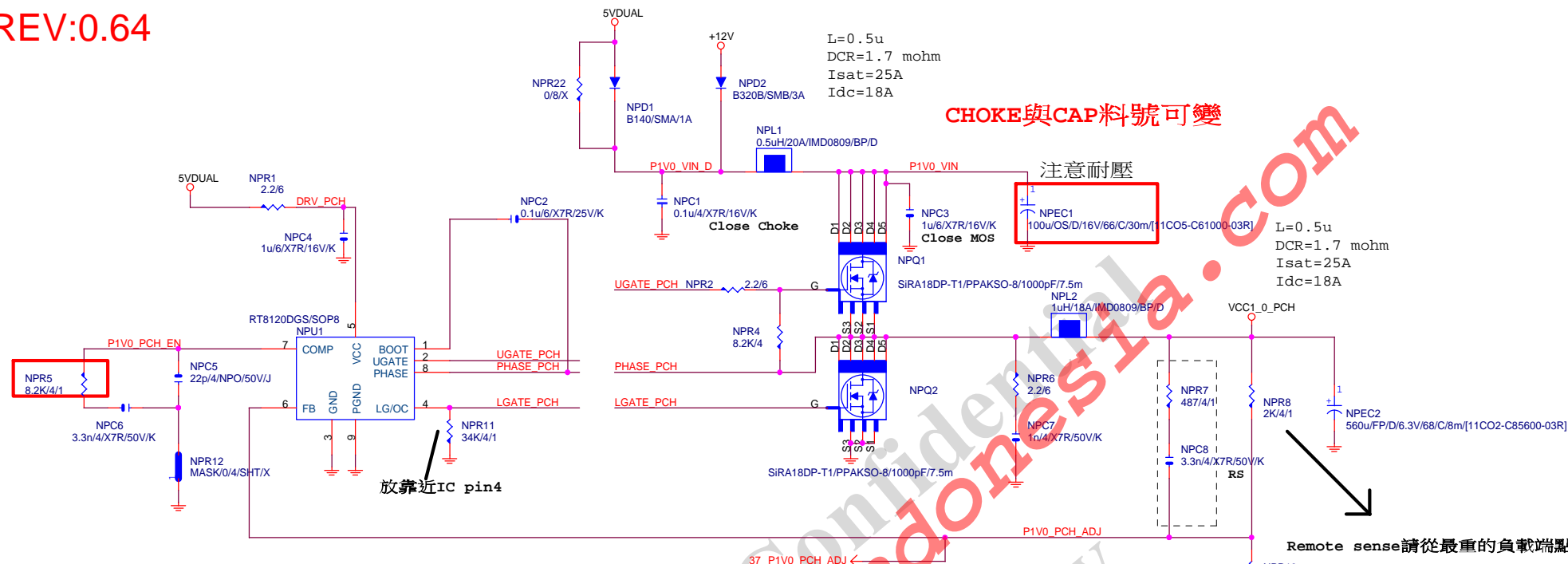
\* 大電容 x1



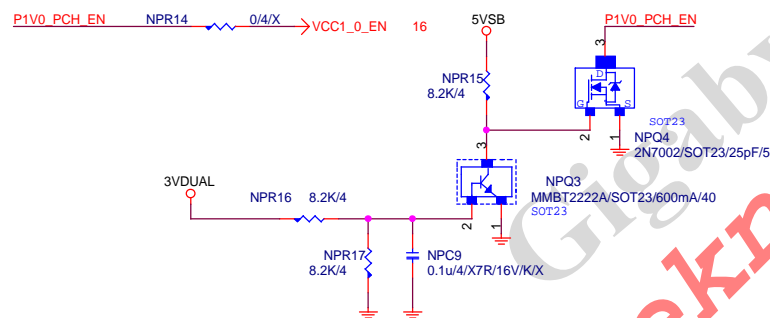
GIGABYTE™

Title		
RT8120_VPP25 POWER		
Size	Document Number	Rev
Custom	GA-Z170X-Designare	1.0
Date:	Monday, May 16, 2016	Sheet 34 of 73

REV:0.64



PWR\_SEQ

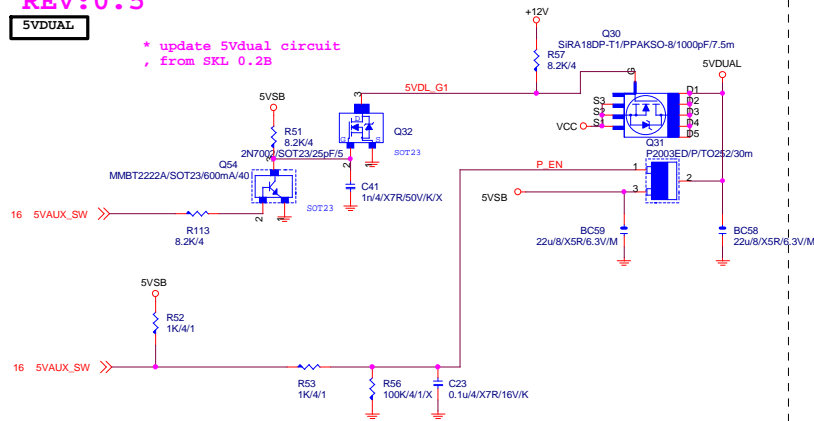


GIGABYTE™			
Title			
RT8120_PCH POWER			
Size	Document Number	Rev	
Custom	GA-Z170X-Designare	1.0	
Date:	Monday, May 16, 2016	Sheet	35 of 73

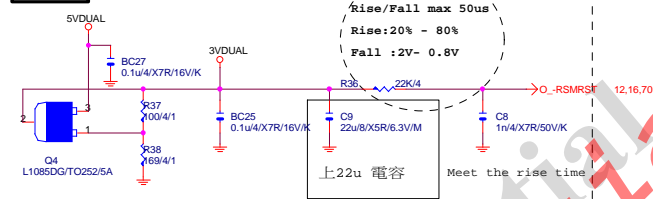
REV: 0.5

5VDUAL

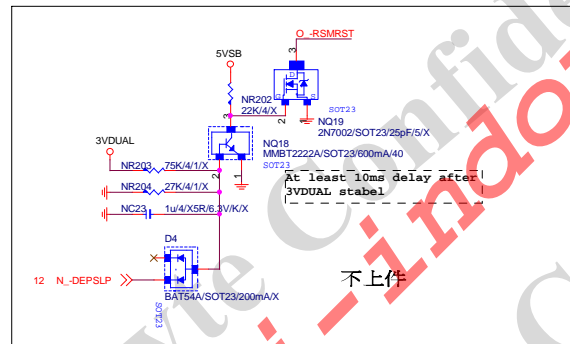
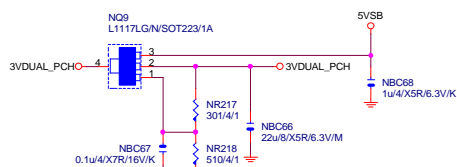
\* update 5Vdual circuit  
from SKL 0.2B



3VDUAL



3VDUAL\_PCH

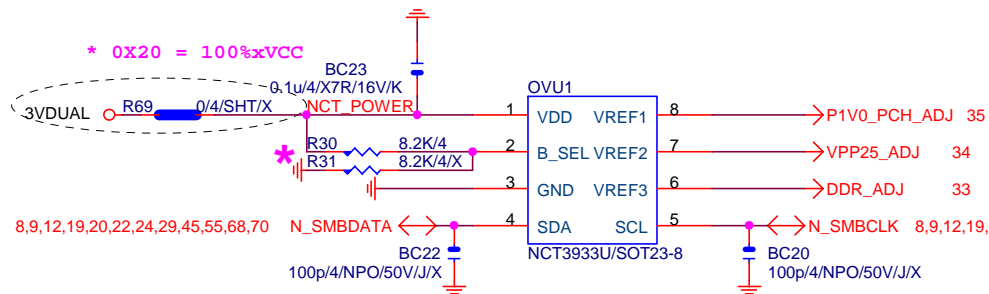


2\_5LEVEL

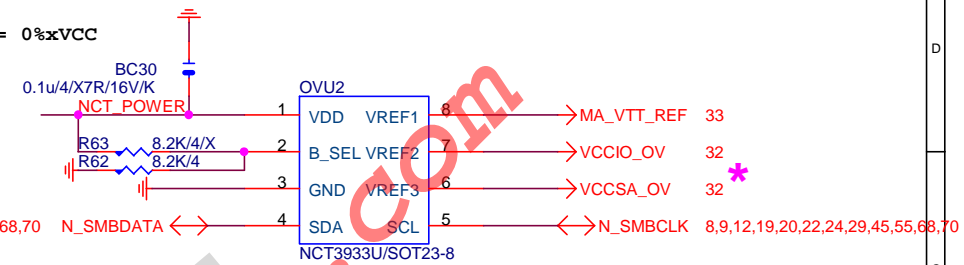
Gigabyte Technology

Title			DISCRETE POWER
Size	Document Number	GA-Z170X-Designare	
Custom		Rev	1.0
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OVER VOLTAGE



0X2A = 0%xVCC



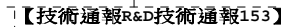
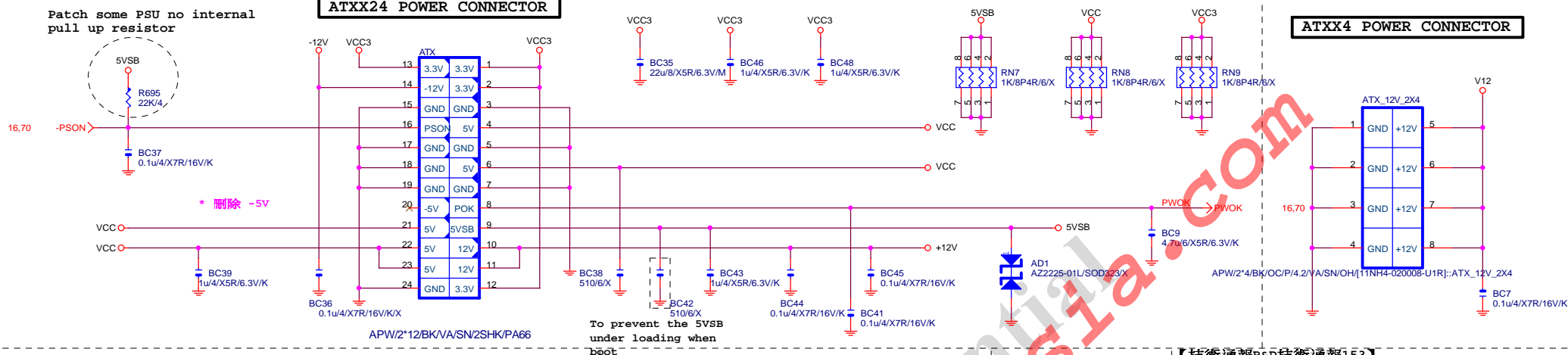
0X22 = 75%xVCC

\* 删除 OVU3

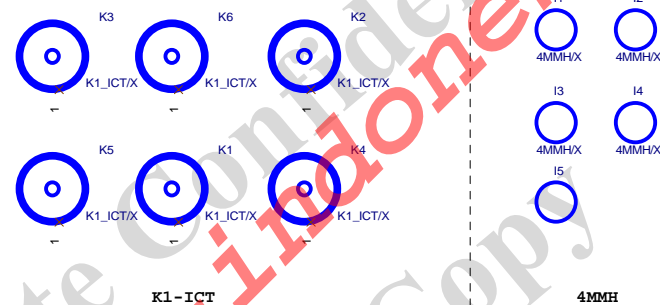
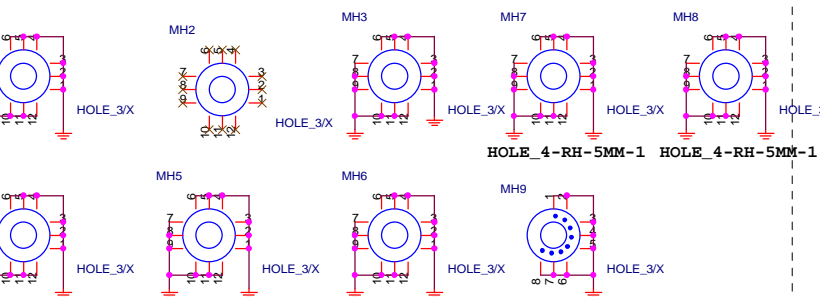
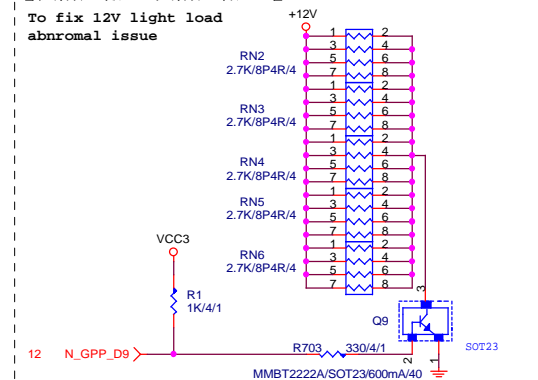
NCT3933	0X2A	0X20	0X22
VREF1	DDRVTT	VREF_DDRA_DQ	PCH Core
VREF2	VREF_DDRA_CA	N/A	VCC1_5_PCH
VREF3	VREF_DDRA_CA	VREF_DDRB_DQ	SMREF

Gigabyte Technology			
Title CPU CORE VR-2			
Size Custom	Document Number	GA-Z170X-Designare	
Date:	Monday, May 16, 2016	Sheet 37 of 73	Rev 1.0

**ATXX4 POWER CONNECTOR**



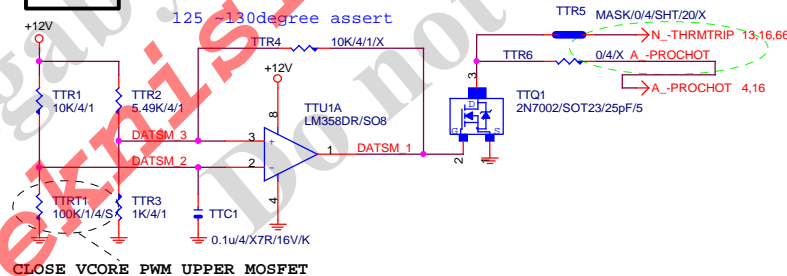
To fix 12V light load  
abnromal issue



**-PROHOT** \* 保留？

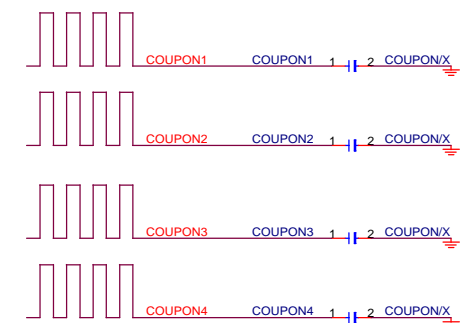
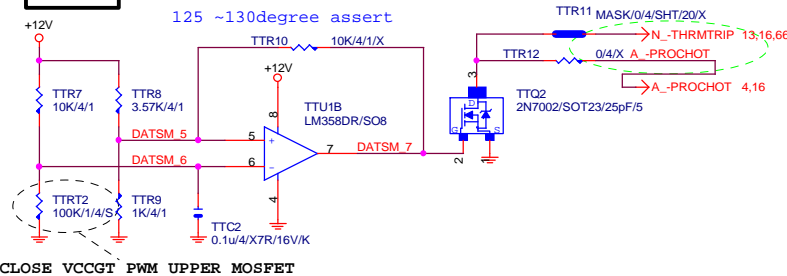


OTP:132度 / PCB THERMAL TRIP:122 度  
125 ~130degree assert



**-PROHOT**

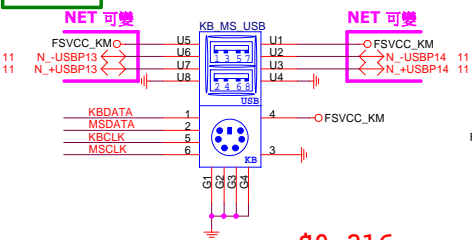
OTP:132度 / PCB THERMAL TRIP:122 度  
125 ~130degree assert





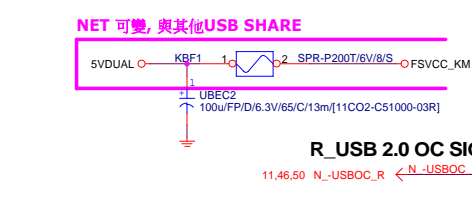
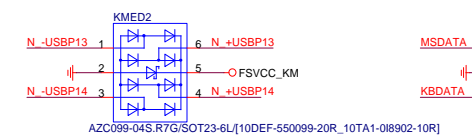
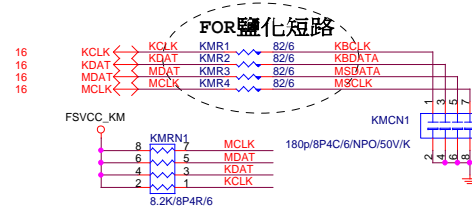
Rev: 0.31

KB/MS

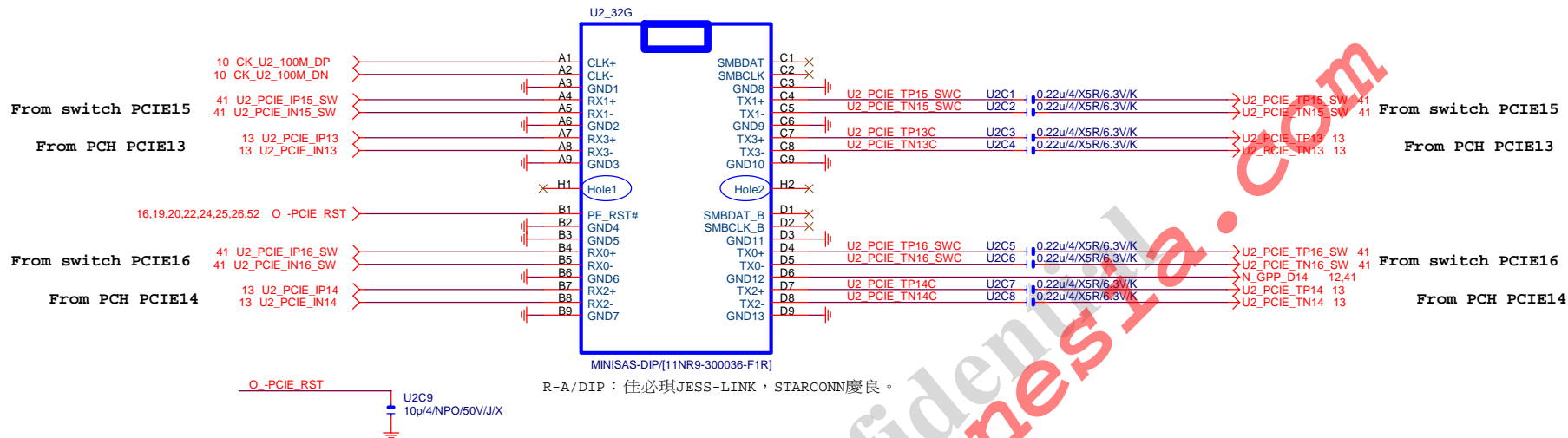


\$0.216

KB/USB/A/PC99(DUAL)/GF/2/RA/D/[11NR6-804006-11R]



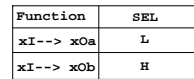
Gigabyte Technology			
Title			
AUDIO JACK			
Size	Document Number	GA-Z170X-Designare	Rev
Custom			1.0
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**GIGABYTE™**

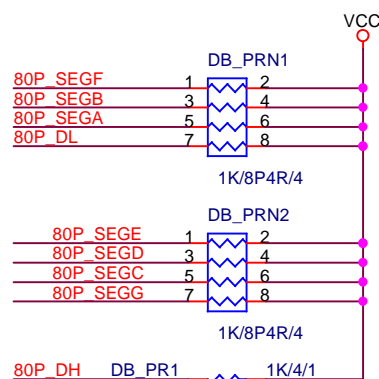
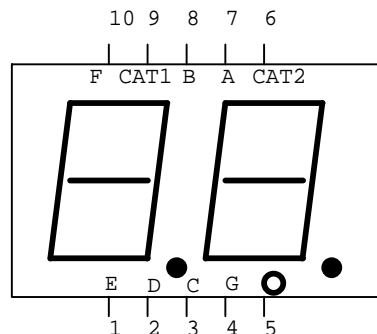
Title		
M.2 to MINISAS		
Size	Document Number	Rev
B	GA-Z170X-Designare	1.0
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(M) TYPE

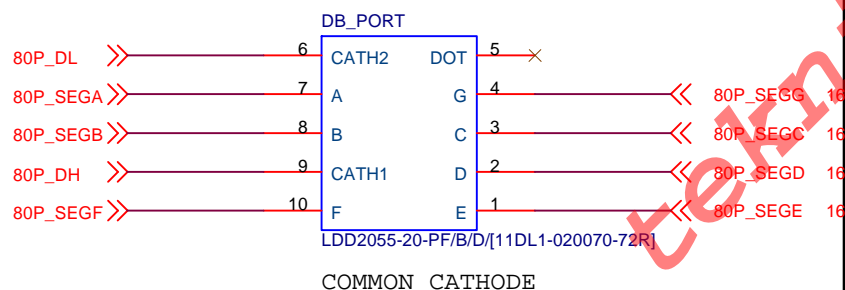


N_GPP_D14	PCIE13	PCIE14	PCIE15	PCIE16
HIGH	PCIE	PCIE	S2	S3
LOW	PCIEX4 (Reverse)			

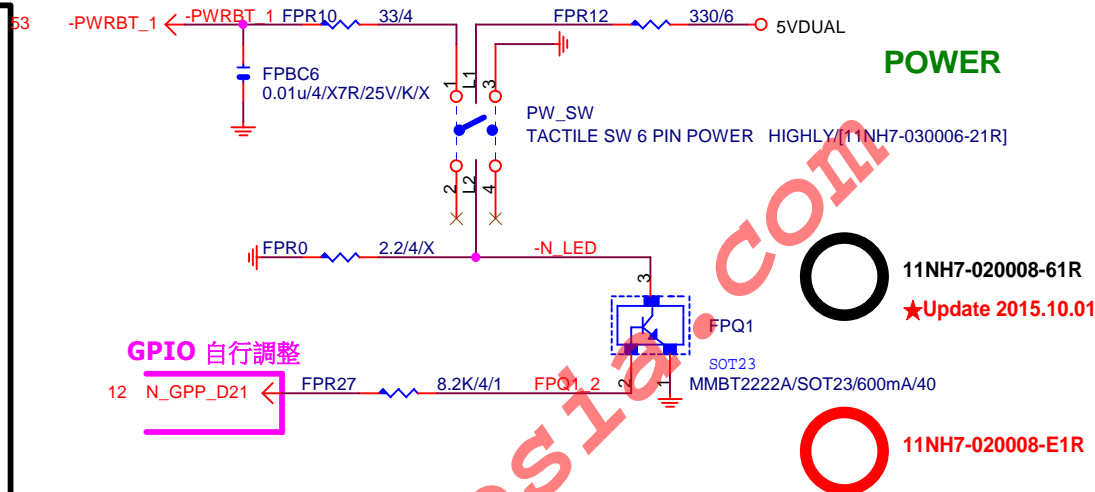
## 80 PORT

Physical Package  
(TOP VIEW)

★Update 2015-05.27



COMMON CATHODE



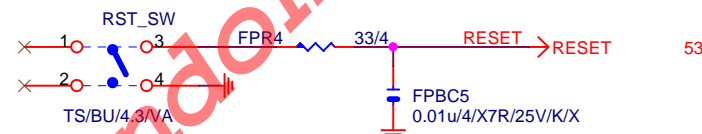
## POWER

11NH7-020008-61R

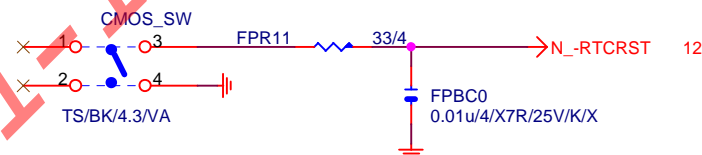
★Update 2015.10.01

11NH7-020008-E1R

## Reset

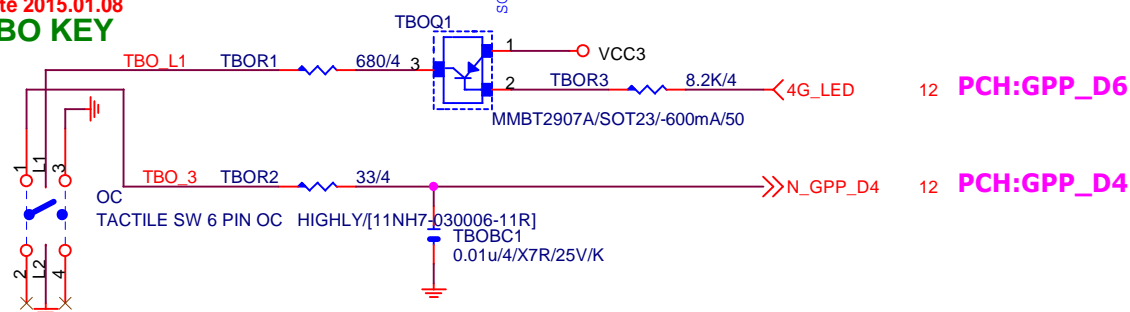


## Clear CMOS



★Update 2015.01.08

**TURBO KEY**



2 PCH:GPP D6

**PCH:GPP\_D4**

**Gigabyte Technology**  
**NXP-PTN3356**

Title
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Size	1
Custom	

Document Number
-----------------

## GA-Z170X-Designare

Rev	1.0
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Date: Monday, May 16, 2016

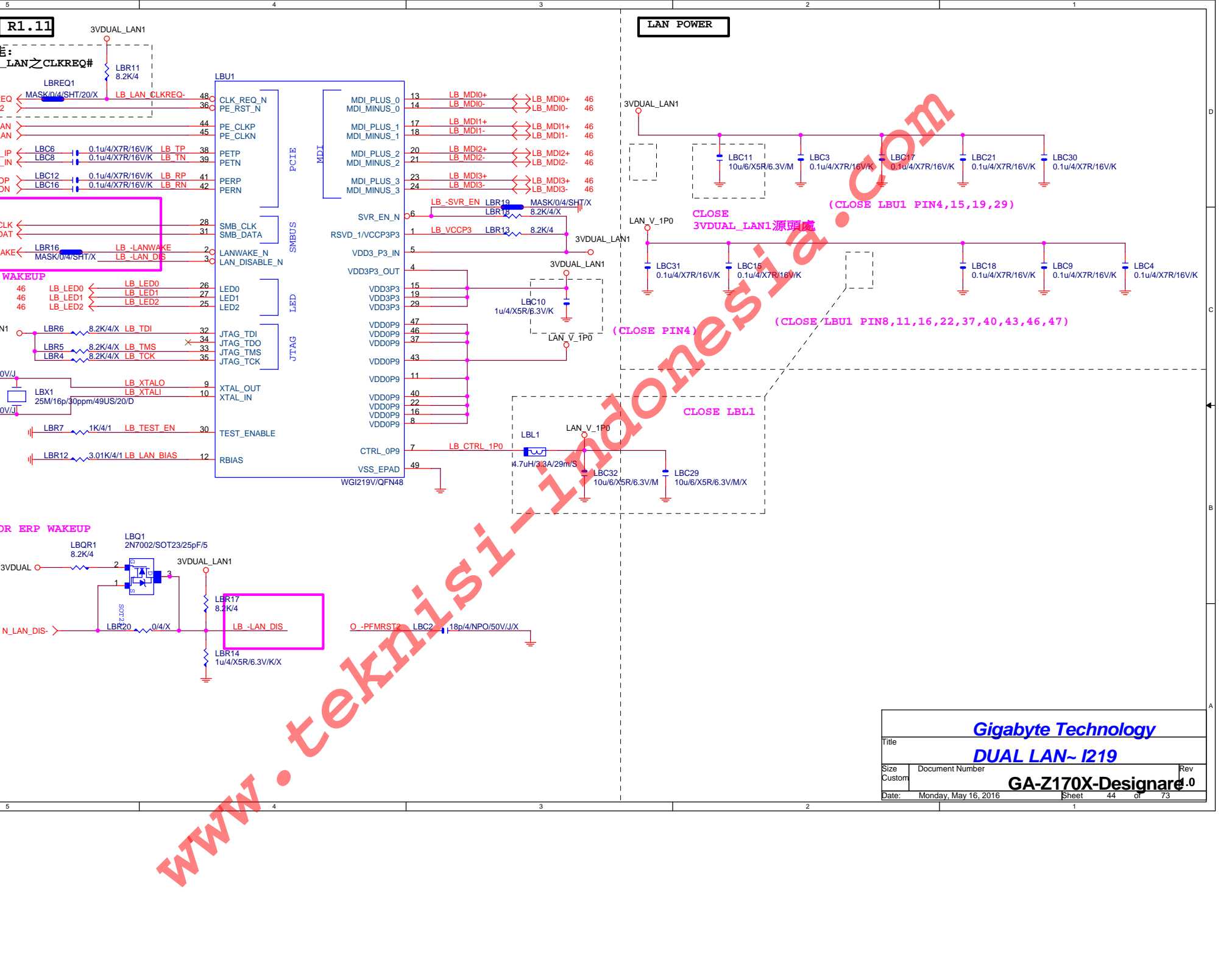
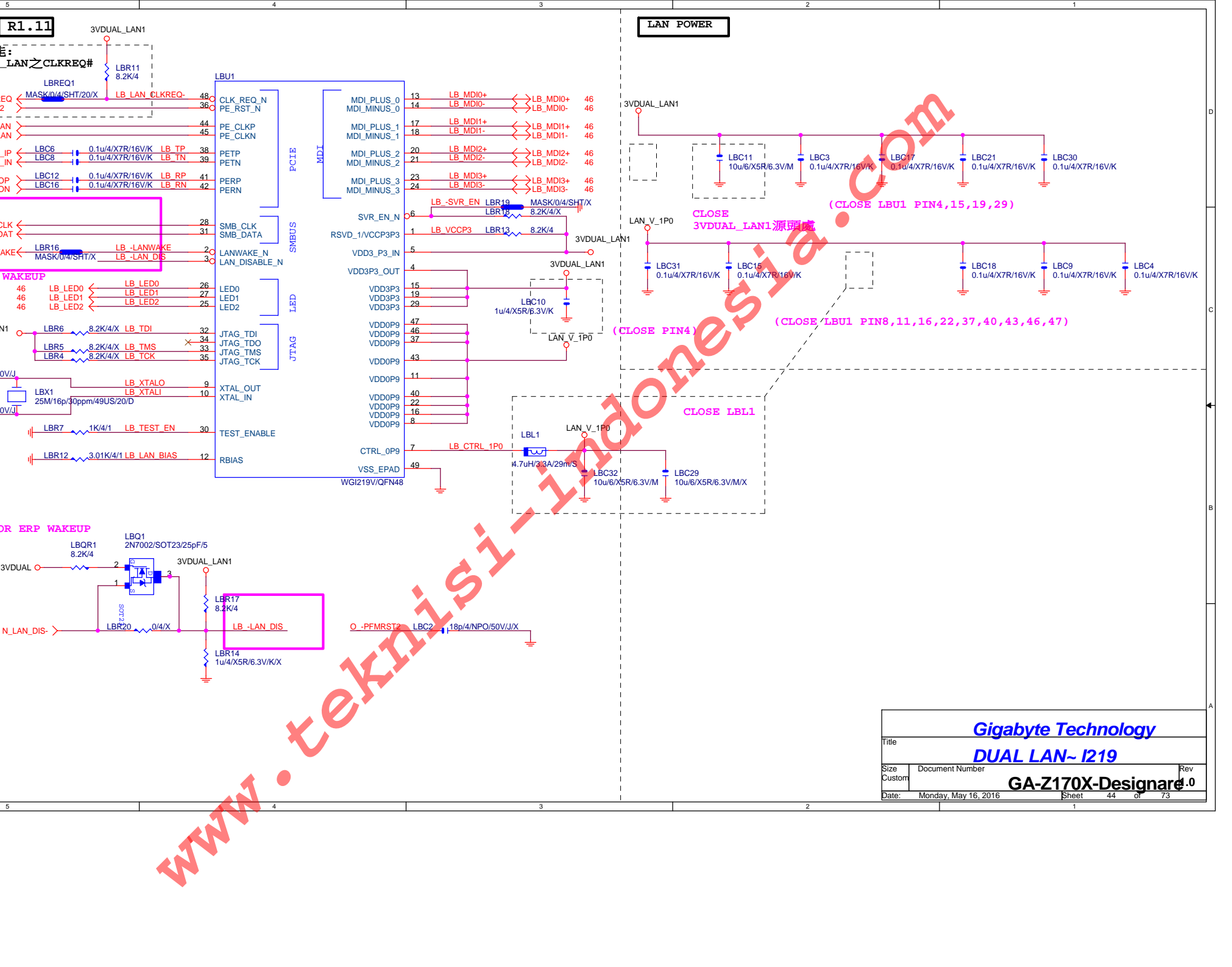
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3

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[illegible][illegible][illegible][illegible]

I211AT不支援:NC-SI,SMBus

N/A

3VDUAL\_LAN2

When pulled up, iNVM security features are enabled.

N/A

LAN POWER

LAN FLASH

SUPPORT CIRCUITS

POWER  
SUPPLY &  
I210  
REGULATOR

I211-AT\_MDI\_LED\_SDP

WG1211AT/QFN64(10HP2-400211-10R)

Gigabyte Technology

DUAL LAN~ I211

GA-Z170X-Designare 0

Title

Size  
Custom

Document Number

Date: Monday, May 16, 2016

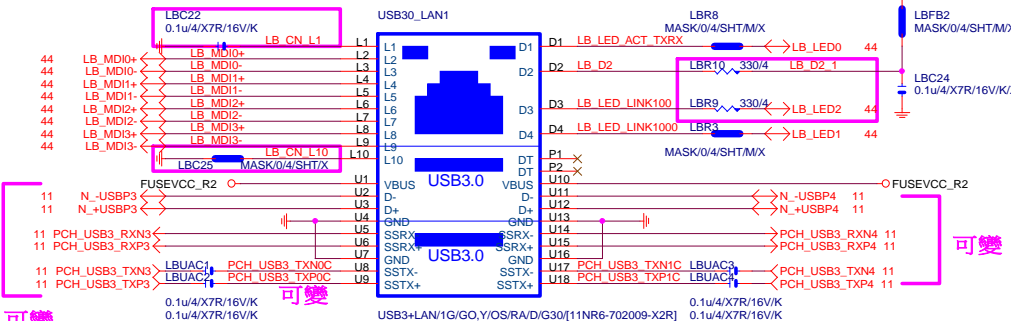
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Rev



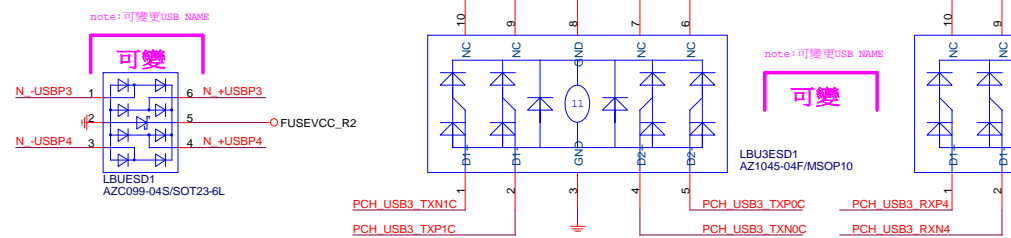
# USB\_LAN CONNECTOR-B R1.11

[I219]



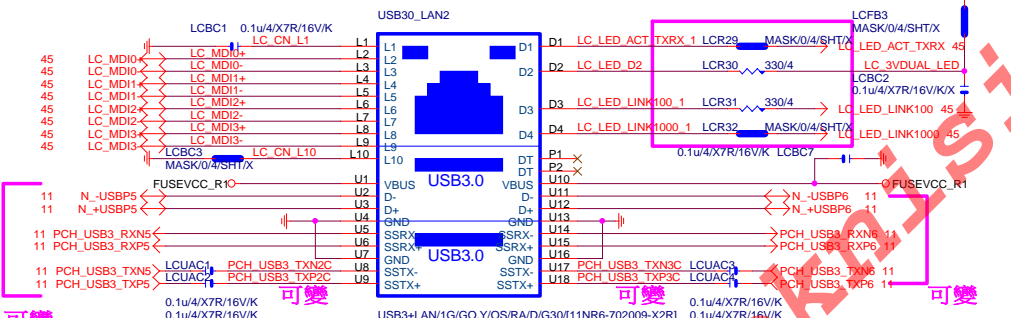
LA\_MDI-->100歐姆:[20/4/8/4/20]

## RMA ESD PROTECT



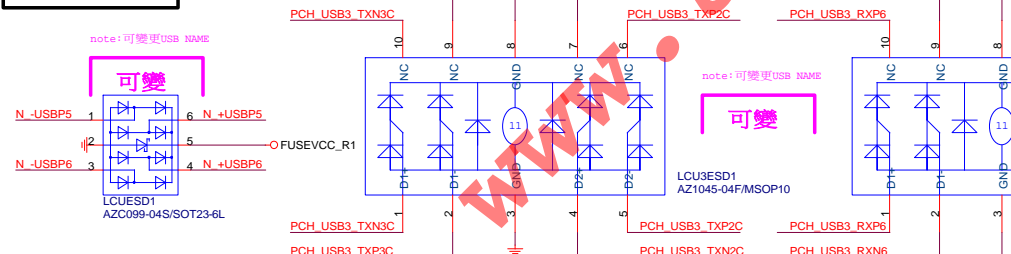
## USB\_LAN CONNECTOR-C

[I211]

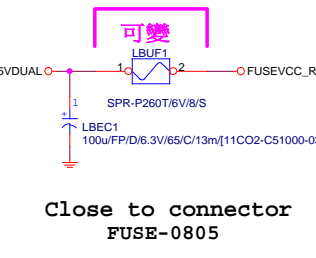


LA\_MDI-->100歐姆:[20/4/8/4/20]

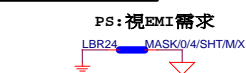
## RMA ESD PROTECT



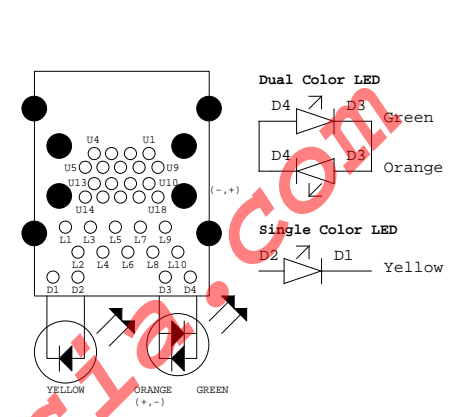
## USB POWER



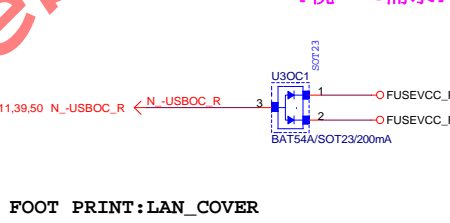
## EMI SHORT PAD



## USB30\_LAN LAYOUT示意图



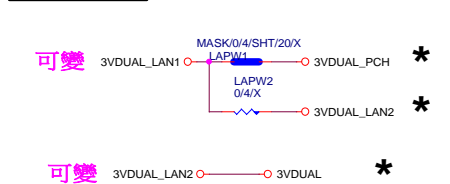
## LAN COVER



## NOTE:

- 3VDUAL\_LAN1, 3VDUAL\_LAN2 對接POWER供應電流 [目前暫接3VDUAL]
- USB2.0/3.0對應USB PORT [目前暫接USB 0,1,2,3 PORT]
- USB DROOP/DROP E-CAP
- USB OC線路

## LAN POWER

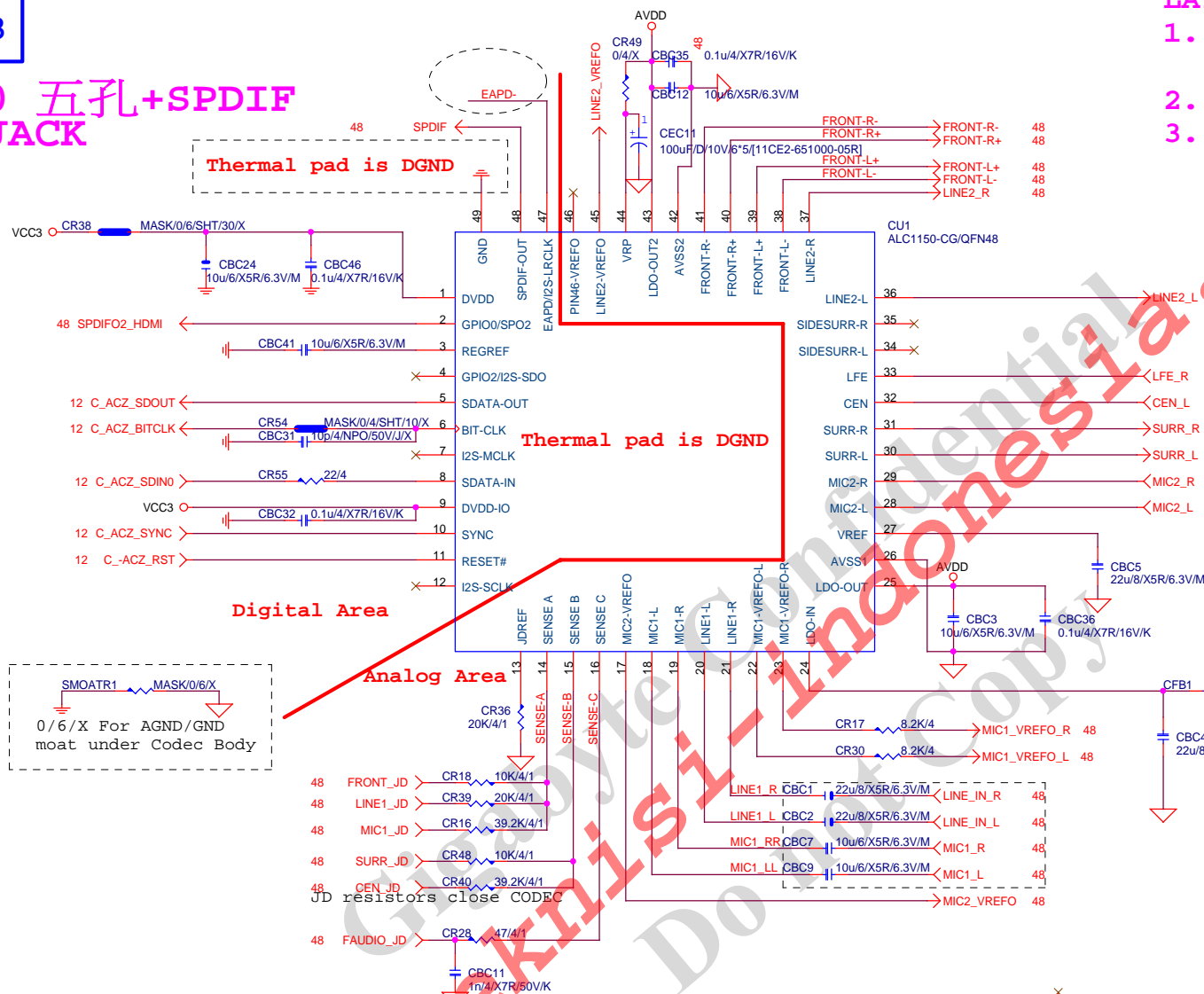


~USB30\_LAN1設定在ERP可LAN WAKEUP  
~USB30\_LAN2由獨立LAN POWER L1117供給

Gigabyte Technology			
LAN CONNECTOR-I219&I211			
Size	Document Number	Rev	1.0
Custom			
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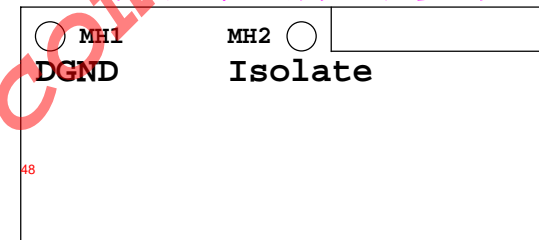
Rev 0.93

# ALC1150 五孔+SPDIF AUDIO JACK



LAYOUT注意:螺絲孔下GND方式

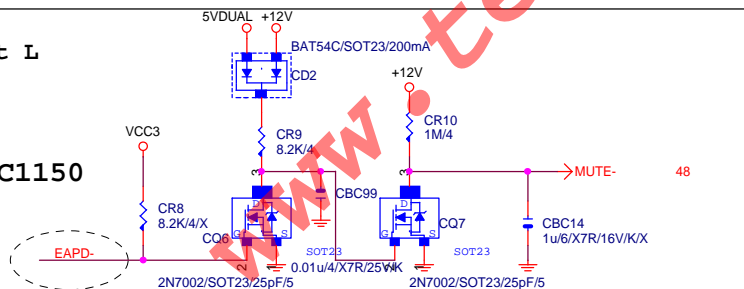
1. MH1空間夠,下DGND  
空間不夠,才改為Isolate
2. MH2一律改為Isolate
3. Codec下方,第二層必須參考GND



SMOATR1 MASK/0/6/X  
0/6/X For AGND/GND  
moat under Codec Body

EAPD: Default L  
H : ON  
L : OFF

Close to ALC1150



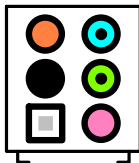
LAYOUT注意:要加  
GND切割線



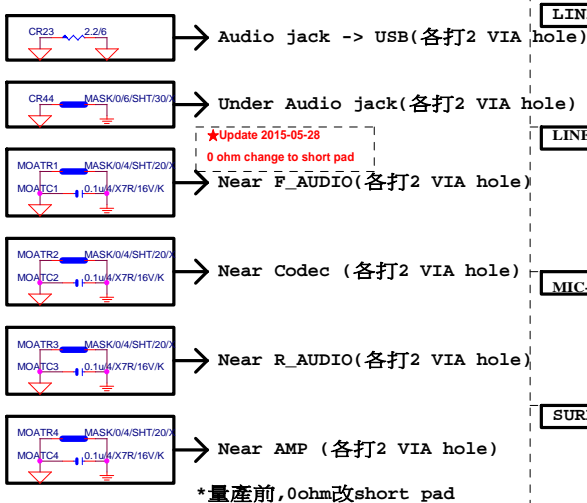
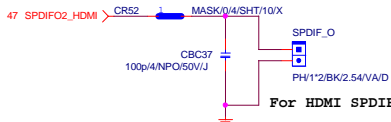
Gigabyte Technology

Title				
ALC1150				
Size	Document Number	GA-Z170X-Designare		Rev
Custom				1.0
Date:	Monday, May 16, 2016	Sheet	47 of 73	

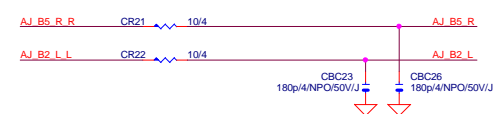
AZALIA JACK



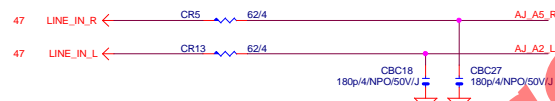
## SPDIF\_OUT



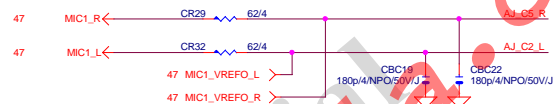
## LINE-OUT



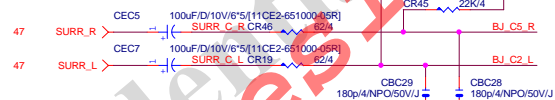
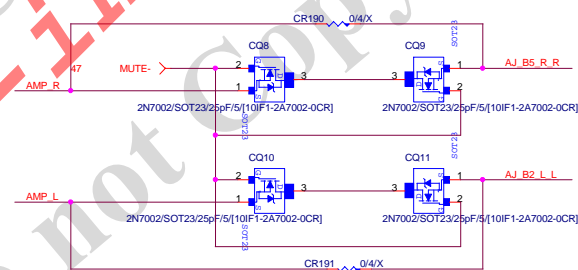
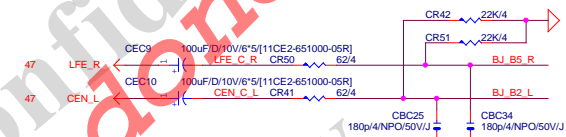
**LINE-IN**



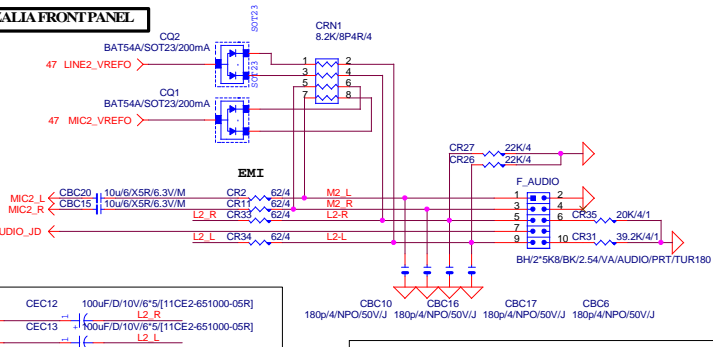
## MIC-IN



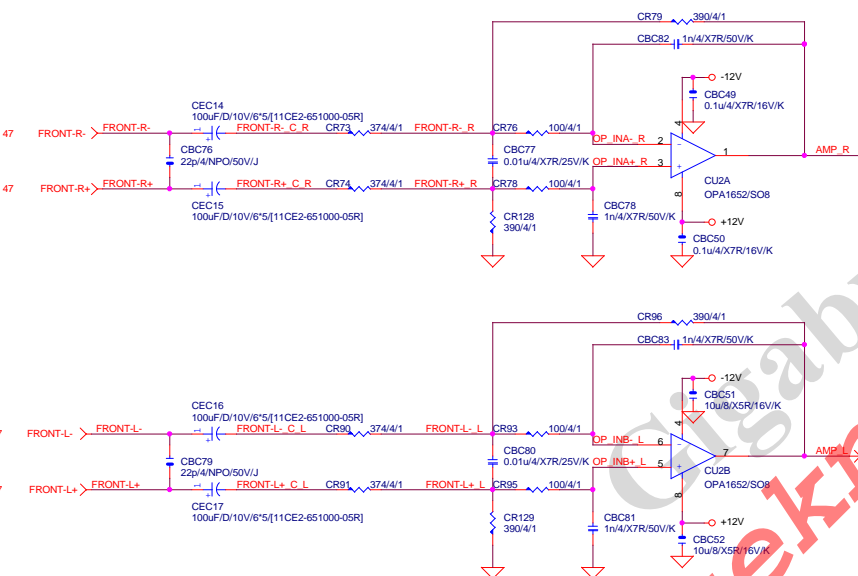
**SURROUND**

**CEN/LFE**

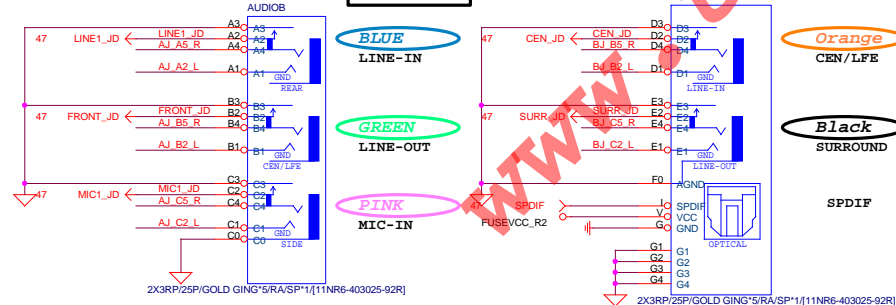
### AZALIA FRONT PANEL



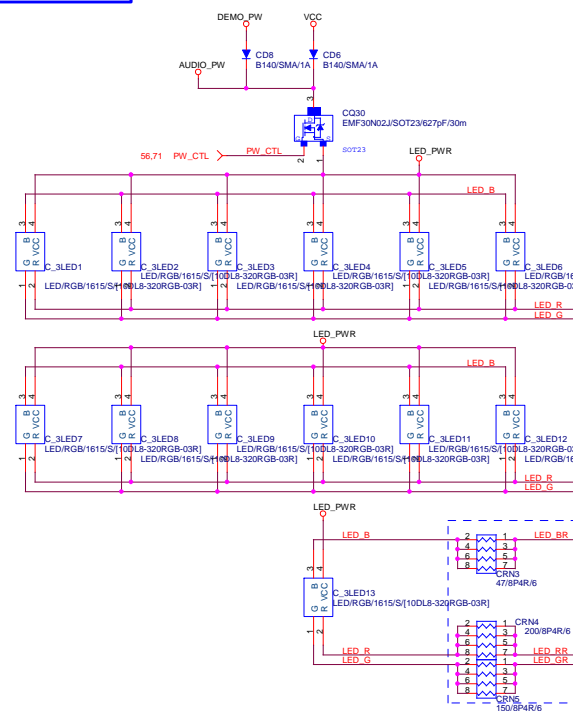
## Differential to Single-End AMPLIFIED



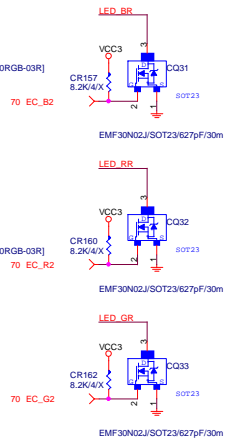
**AZALIA JACK**



## DEMO LED ON



## RGB LED CONTROL

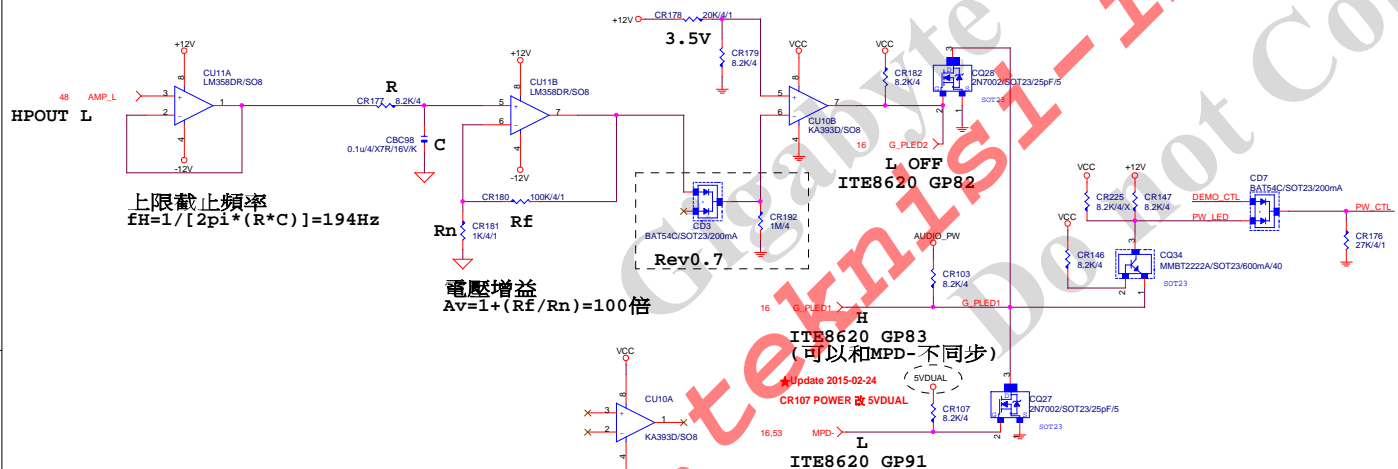


## AUDIO LED Control

	IO_GP82	IO_GP83	IO_GP91
Still Mode	L	H	L
OFF Mode	L	L	L
Pluse Mode	L	H	BREATH
Beat Mode	OD	H	L

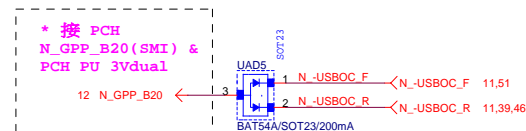
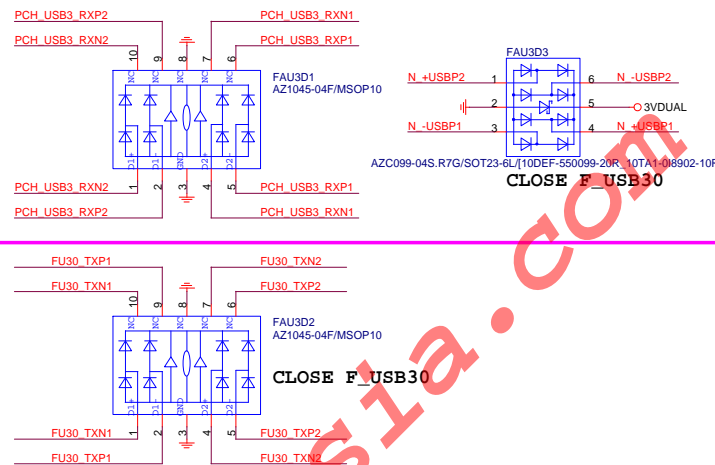
## 三色 LED Control

	EC_GP30 (R)	EC_GP44 (G)	EC_GP (B)
藍	L	L	H
綠	L	H	L
淺綠	L	H	H
紅	H	L	L
粉紅	H	L	H
黃	H	H	L
白光	H	H	H
循環	順序:藍-綠-淺綠-紅-粉紅-黃-白光切換間隔時間為 1 秒		



GIGABYTE™

Title	AUDIO LED	
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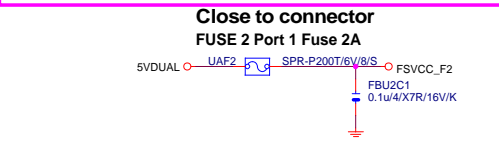
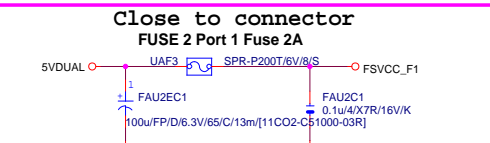
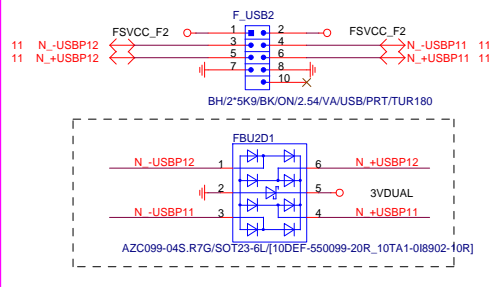
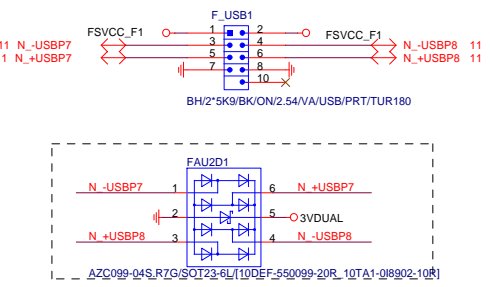


FRONT USB1

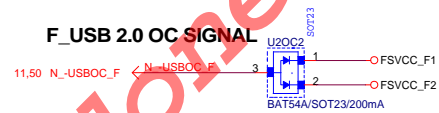
FRONT USB2

NET 可變

NET 可變



F\_USB 2.0 OC SIGNAL



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USB2.0

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## ★Update 2015-12-29

★Update 2015-12-29

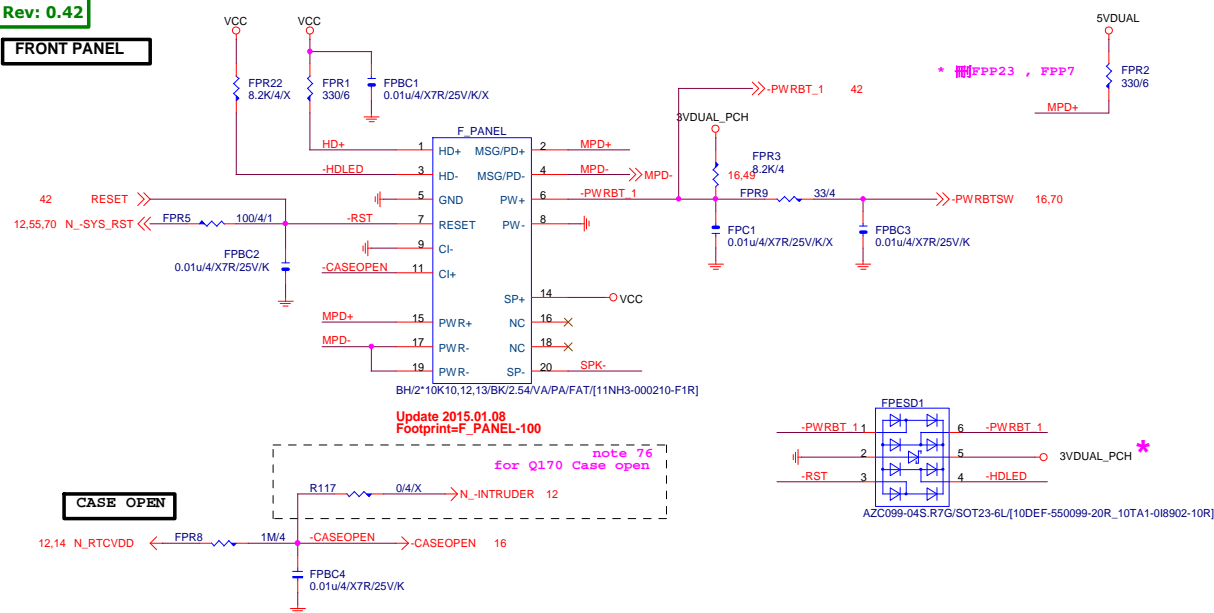


## TPM CONNECT

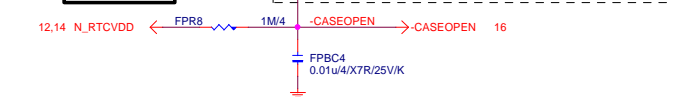




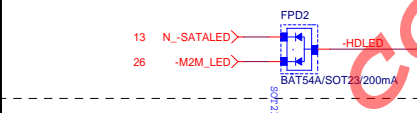
FRONT PANEL



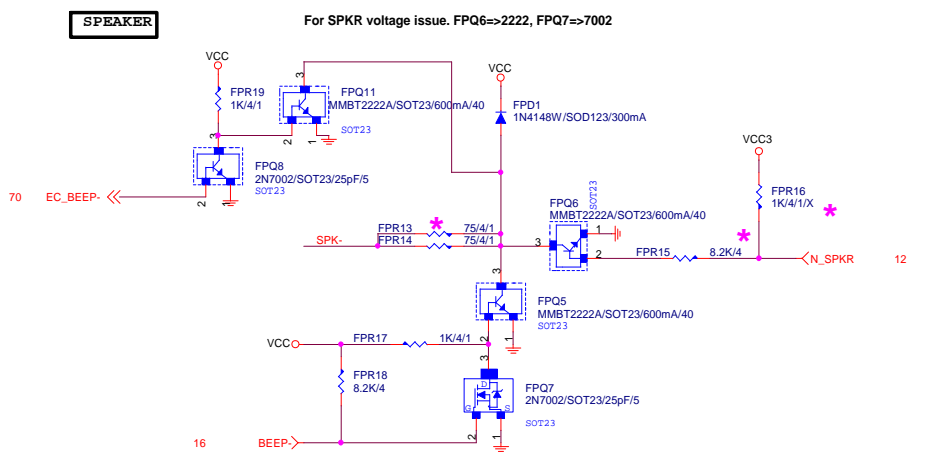
CASE OPEN



SATA LED SATALED# signal open-collector, pull-up (8.2 kΩ to 10 kΩ) to Vcc3\_3



SPEAKER

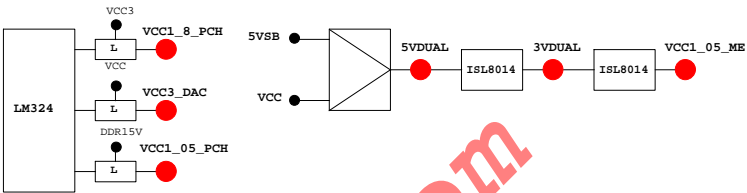


PCH GPIO LIST TABLE					
PIN NAME	PWR	Default	USAGE	NOTE	
GP0	MAIN	H-Z	GPI0	N/A	
GP1/TACH1	MAIN		GPI01	N/A	
GP2/PIRQ#	MAIN		GPI	-PIRQE	P/U 8.2K VCC3
GP3/PIRQF#	MAIN		GPI	-PIRQF	P/U 8.2K VCC3
GP4/PIRQG#	MAIN		GPI	-PIRQG	P/U 8.2K VCC3
GP5/PIRQH#	MAIN		GPI	-PIRQH	P/U 8.2K VCC3
GP6/TACH2	MAIN		GPI	PCIEX1 Detect	P/U 8.2K VCC3
GP7/TACH3	MAIN		GPI	GPI07	P/U 8.2K VCC3
GP8	STBY	H	GPI	GPI08	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	GPI012	N/A
GP13	STBY	L	GPI	LPCPME#	P/U 8.2K 3VDUAL
GP14/OC7#	STBY		NATIVE	USB OC7#	N/A
GP15	STBY	L	GPI	GPI015(TLS Enable)	P/U 8.2K 3VDUAL
GP16	MAIN		GPI	GPI016	P/U 8.2K VCC3
GP17/TACH0	MAIN		GPI	GPI017	P/U 8.2K VCC3
GP18	MAIN		GPI	Mobile Only	N/A
GP19	MAIN		GPI	GPI019	P/U 8.2K VCC3
GP20	MAIN		GPI	GPI020	P/U 8.2K VCC3
GP21	MAIN		GPI	GPI021	P/U 8.2K VCC3
GP22	MAIN	H-Z	GPI	GPI022	P/U 8.2K VCC3
GP23	MAIN		GPI	GPI023	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	GPI027	P/U 8.2K 3VDUAL
GP28	STBY	H	GPO	PWR LED	P/U 8.2K 3VDUAL
GP29	STBY	L	GPI	GPI029	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	GPI039	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	GPI044	P/U 8.2K 3VDUAL
GP45	STBY		NATIVE	GPI045	P/U 8.2K 3VDUAL
GP46	STBY	L	NATIVE	GPI046	P/U 8.2K 3VDUAL
GP47	STBY			Mobile Only	N/A
GP48	MAIN	H-Z	IN	GPI048	P/U 8.2K 3VDUAL
GP49	MAIN	H-Z	IN	GPI049	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	GPI063	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

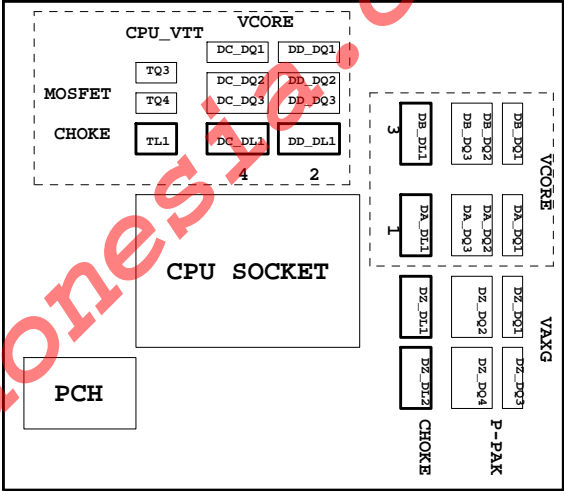
Super I/O ITE8720 GPIO Table

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#CIRRXL/GP55	-RSMRST	
PME#/GP54	-LPCPME	
PD5/GP75/BUSS00	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	-PFMRST1	
PCIRST1#/GP12	-PFMRST2	
3VBSBW#/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/BUSS01	MB_ID3	
PD7/GP77/BUSS02	MB_ID4	
AFD#/GP86/SMB_C_R	SRG_2x8	FST_2X8
INIT#/GP85/SMB_D_M	DDR_LED1_C	GTLREF_AD2
ACK#/GP83	DDR_LED2_C	
STB#/GP87/SMB_C_M	DDR_LED3_C	
PWRON#GP44	VCORE_OV1	
PANSW#/#GP43	PWRBTSW	
KDAT/GP61	-PWRBTSW	
KCLK/GP60	KDAT	
MDAT/GP57	KCLK	
MACL/GP56	MDAT	
GP66/VLDIT_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/SMB_D_R	-EN_PWM2	
PSI_L/FAN_CLT5/CIRRXL2/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/BUSS00	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

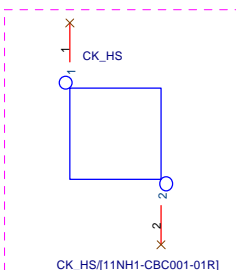
散熱模組料號：

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

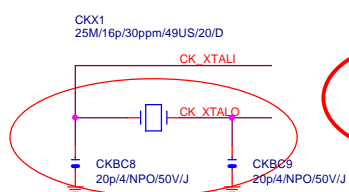
	3 pin FAN control	4 pin FAN control	FAN speed	Controller
CPU FAN	FANPWM1	FANPWM3	FANIO1	IT8720
	ICH_FAN_PWM2	ICH_FAN_PWM0	ICH_FAN_TACH0	PCH
SYS FAN	FANPWM2	N/A	FANIO2	IT8720
	ICH_FAN_PWM1	N/A	ICH_FAN_TACH1	PCH
PWR FAN	N/A	N/A	FANIO3	IT8720
			ICH_FAN_TACH2	PCH

Gigabyte Technology			
Title	TABLE LIST		
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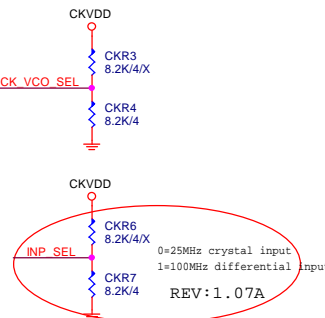
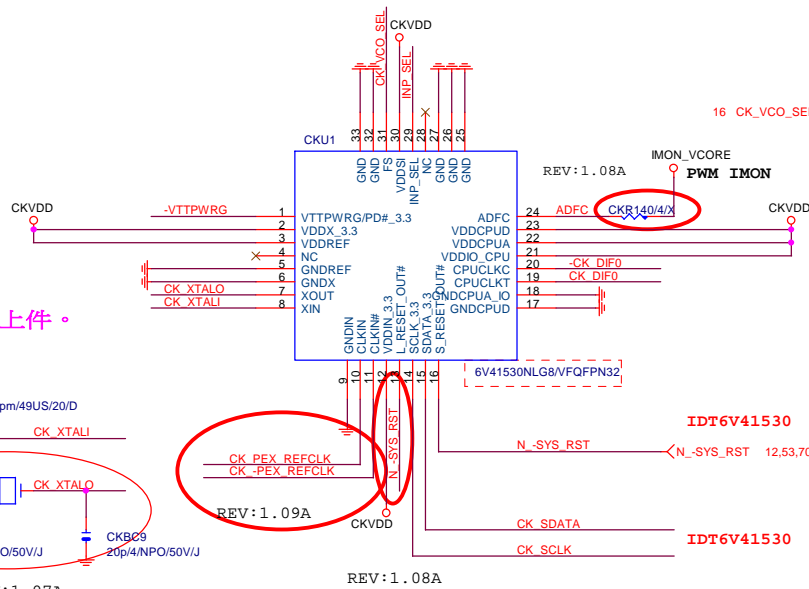
IDT6V41530



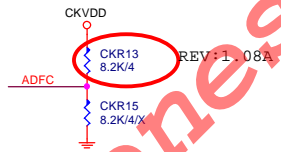
\*可變，依需求上件不上件。



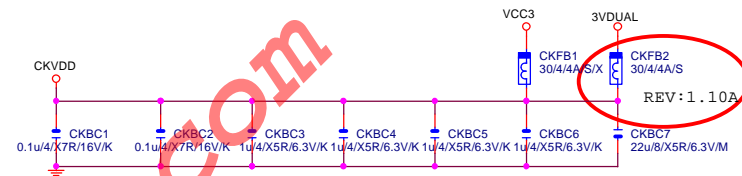
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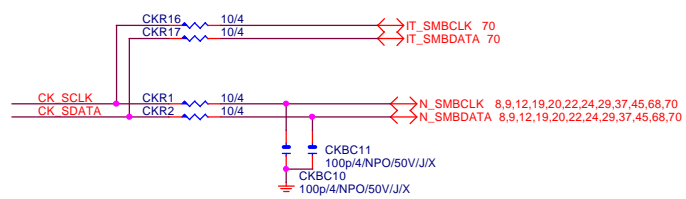
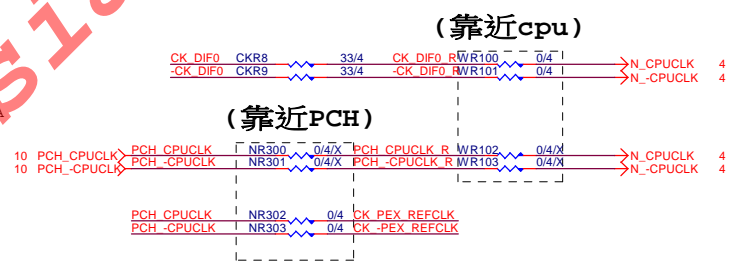
REV:1.07A



REV:1.08A

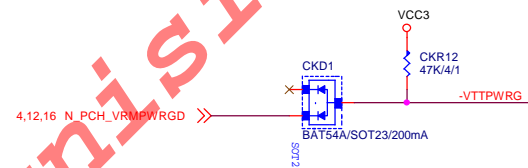


REV:1.10A

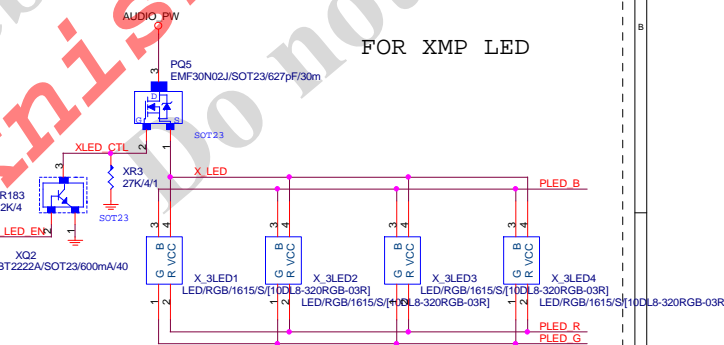
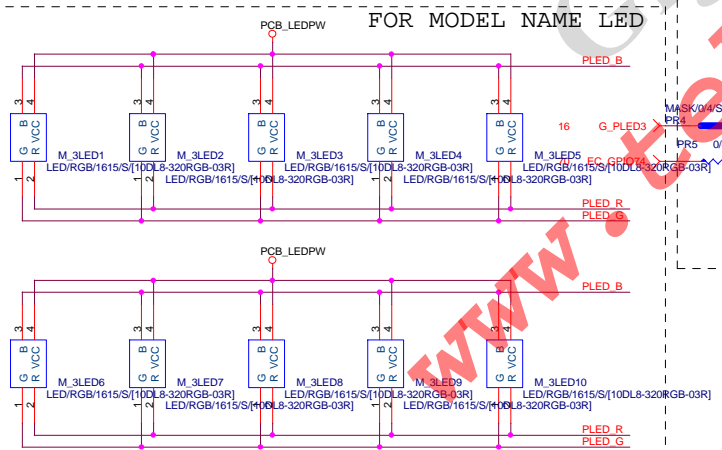
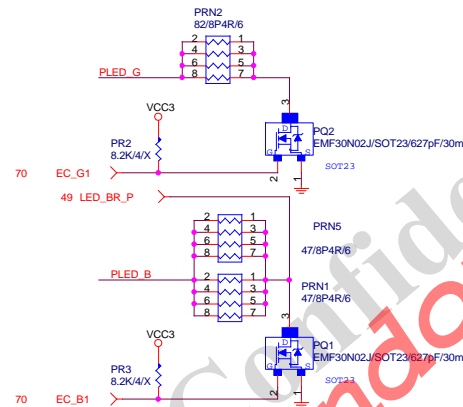
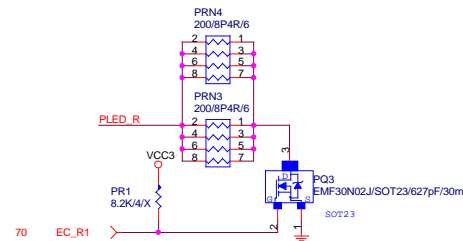
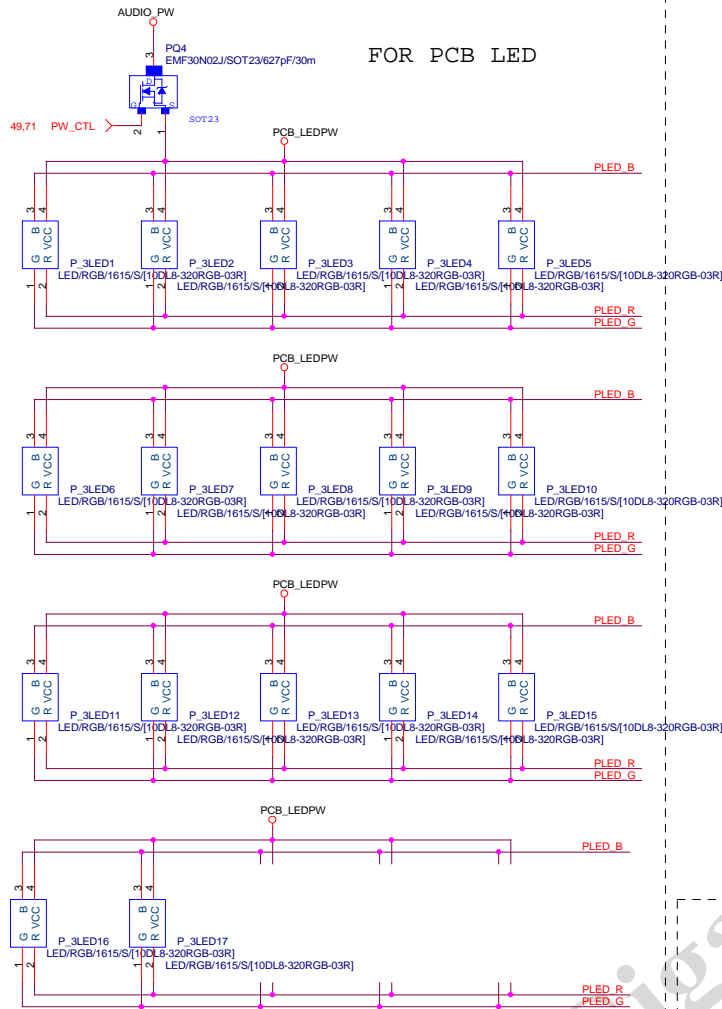


INP_SEL	Intput
0	Crystal
1	CLK_INP/M

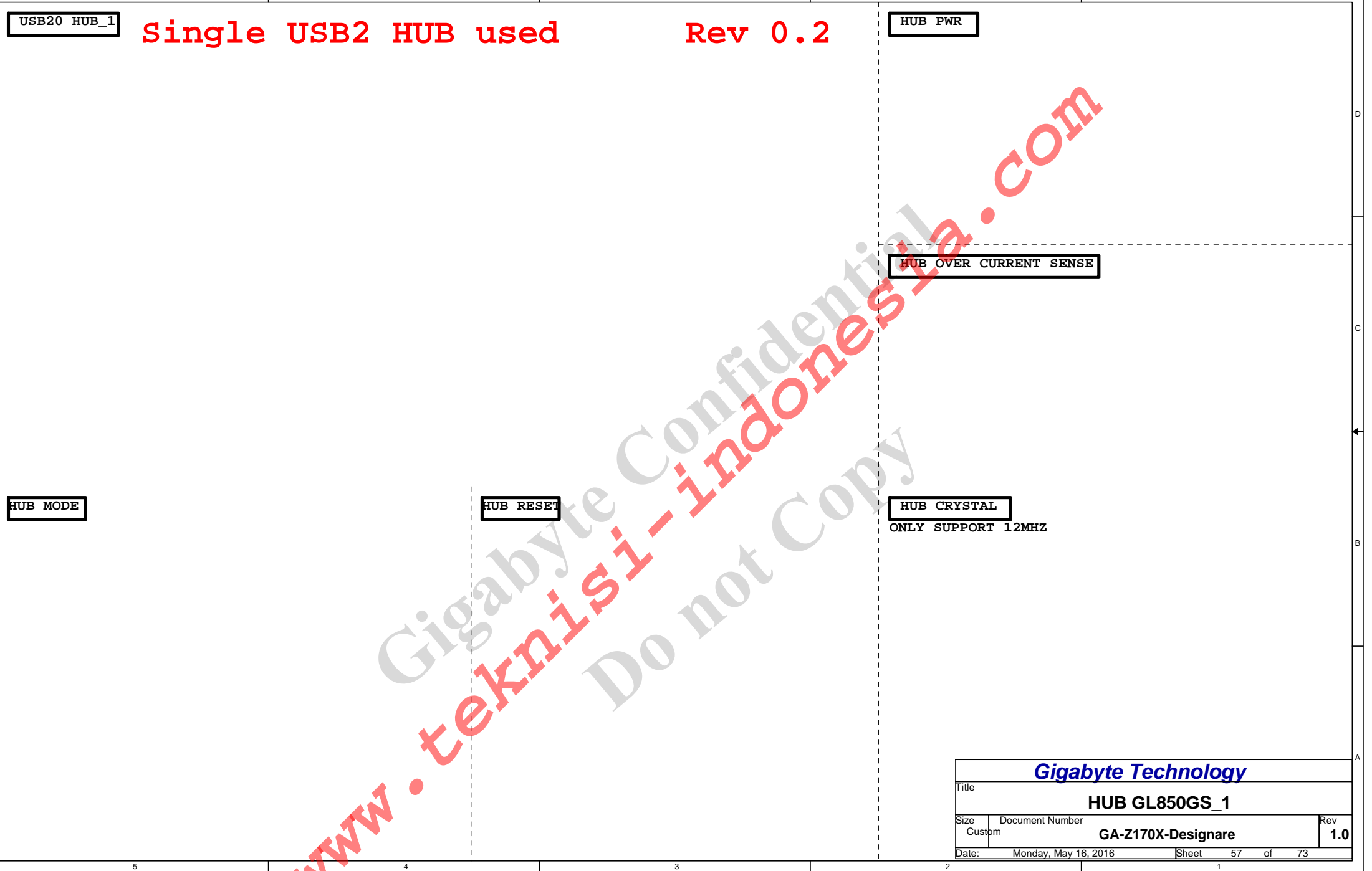
CK_VCO_SEL	VCO
0	400M
1	1200M



			
Title <b>IDT6V41530_CLK BUFFER</b>			
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GIGABYTE™		
Title		
MODEL NAME LED		
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Title		
HUB GL850GS_1		
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SINGLE Display Port

Display Port with HDMI, or HDMI only.



DP  
HDMI

Footprint: DP\_HDMI-2,  
P/N: 11NR6-H04039-02R

OR

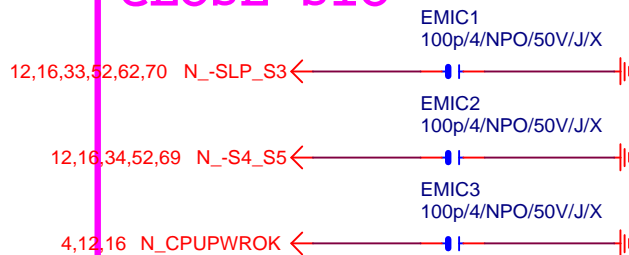


HDMI only

Footprint: DP\_HDMI-2, Capture  
Value: HDMI/19P/BK/S/RA/INTEL

GIGABYTE			
Title			
DP PORT			
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### CLOSE SIO



### CLOSE PCH



### CLOSE AUDIO

**GIGABYTE™**

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EM/ESD		
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固態電容料號.請自行修改

日系黑色固態	Capture Value
11C02-C85600-01R	560u/FP/D/6.3V/68/C/8m
11C05-C82700-01R	270u/FP/D/16V/88/C/12m
11C05-C61000-01R	100u/OS/D/16V/66/C/30m
11C02-C51000-01R	100u/FP/D/6.3V/65/C/13m

日系一般固態	Capture Value
11C02-685600-01R	560u/FP/D/6.3V/68/8m
11C05-882700-01R	270u/FP/D/16V/88/12m
11C05-661000-03R	100u/OS/D/16V/66/30m
11C02-651000-02R	100u/OS/D/6.3V/66/30m

台系固態	Capture Value
11C02-661000-09R	100u/OS/D/6.3V/66/A/35m
11C05-691000-09R	100u/OS/D/16V/69/A/35m
11C05-8C2700-09R	270u/FP/D/16V/8C/A/10m
11C02-695600-09R	560u/FP/D/6.3V/69/A/11m

IRON CHOKE

	料號	Capture Value	SIZE	Footprint
DIP	11LC5-M4500C-01R	0.5uH/40A/IMD109/M/D	10*10	CHOKE05U-40A-1PQ-3
DIP	11LC5-M2500C-01R	0.5uH/20A/IMD0809/M/D	8*8	CHOKE1U-R50M-IF

Ferrite

	料號	Capture Value	SIZE	Footprint
DIP	11LC5-F3500C-11R	0.5uH/32A/INCG109/FSI/D	10*10	CHOKE05U-40A-1PQ-3
DIP	11LC5-F2500C-11R	0.5uH/25A/INC0809/F/D	8*8	CHOKE1U-R50M-IF
SMD	未建(SIUC1007-R30M-JJ1W)		10*7	CHOKE11X8MM-SMD

BEAD

	料號	Capture Value	SIZE	Footprint
DIP	10LFB-15470A-01R	47/4030/15A/S	4*3	BEADC8B-BPH_SMD

PWM料號

		料號	Capture Value	Footprint
PWM	ISL95856	10TA1-695856-01R		IC52QFN-6x6-G
PWM	ISL95858	10TA1-695858-01R		IC52QFN-6x6-G
PWM	IR35201	10TA1-635201-00R		IC56QFN-9VRS4339
PWM	IR3570	10TA1-603570-00R		IC40MLFP-ISL95835

<b>GIGABYTE™</b>			
Title <b>RT8120_DDR4 POWER</b>			
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REAR IO

RS\_SYS

F\_AUDIO

AUDIO

DD\_DQ1 DD\_DQ3 DC\_DQ1 DC\_DQ3 DB\_DQ1 DB\_DQ3  
DD\_DQ4 DD\_DQ2 DC\_DQ4 DC\_DQ2 DB\_DQ4 DB\_DQ2

TTRT1

RS\_VCORE  
ECRS\_VCORE

DD\_DL1 DD\_DL2 DC\_DL1 DC\_DL2 DB\_DL1 DB\_DL2

CPU

DA\_DL1

DA\_DL2

DO\_DL1

DN\_DL1

DM\_DL1

DANTC1

RS\_VCCGT

TTRT2

DA\_DQ1 DA\_DQ3 DA\_DQ4 DA\_DQ2

DO\_DQ1 DO\_DQ2

DN\_DQ1 DN\_DQ2

DM\_DQ1 DM\_DQ2

DANTC2

DANTC3

DANTC4

SIO

PCH

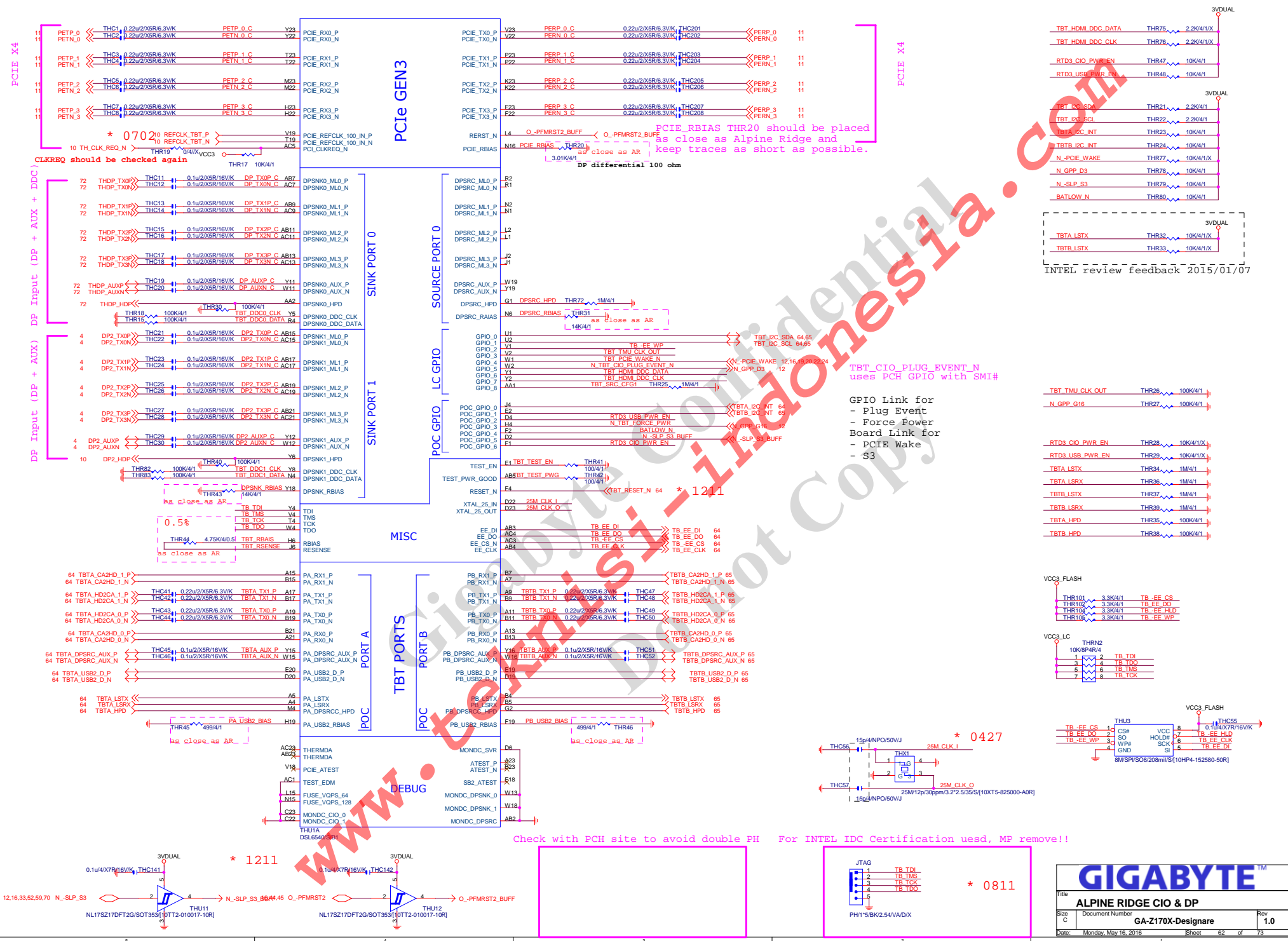
RS\_PCH  
ECRS\_PCH

SATA\_EXPRESS

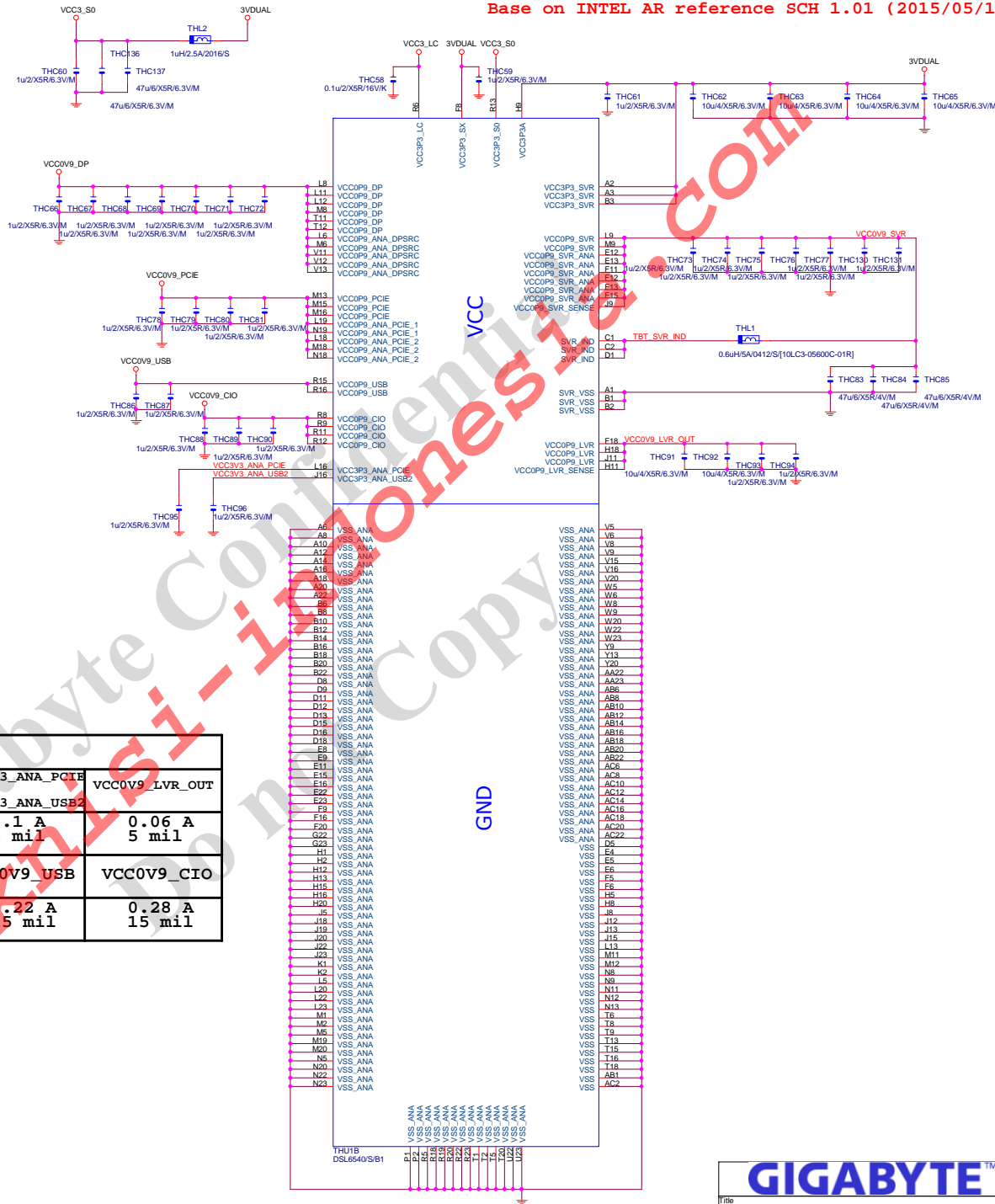
ECRS\_SYS

熱敏電阻	擺放靠近位置	走線方式
DANTC1	DA_DL2	Differential
DANTC2	DA_DQ3	Differential
DANTC3	DM_DQ2	Differential
DANTC4	DM_DL1	Differential
RS_VCORE	DC_DQ2	N/A
RS_VCCGT	DN_DQ2	N/A
TTRT1	DC_DQ4	N/A
TTRT2	DM_DQ2	N/A
RS_PCH	PCH	N/A
RS_SYS	F_AUDIO	N/A
ECRS_PCH	PCH	N/A
ECRS_SYS	SATA	N/A
ECRS_MOS	DC_DQ2	N/A

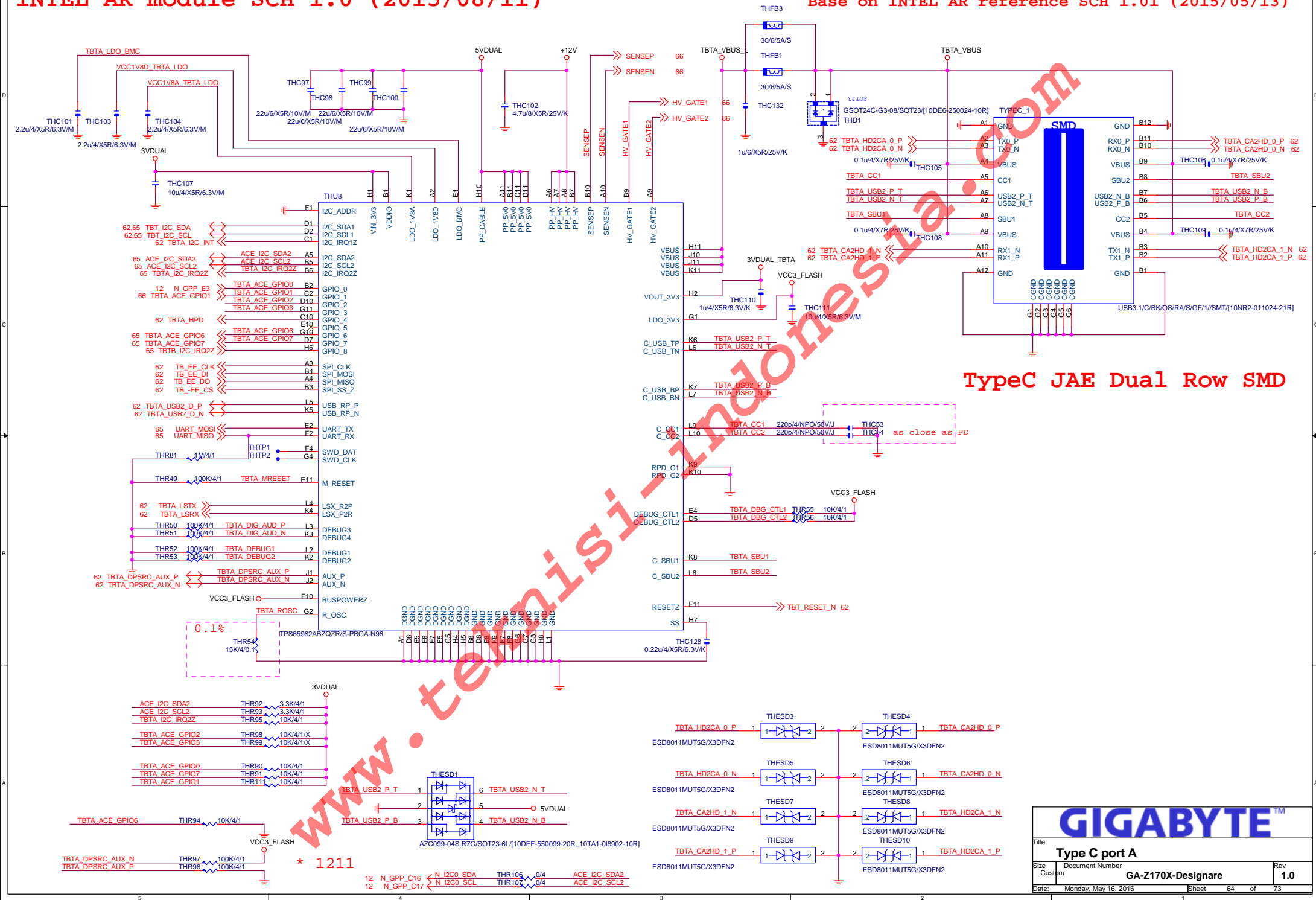
Gigabyte Technology			
File NTC MAP			
Size	Document Number	Rev	
GA-Z170X-Designare		1.0	
GA-Z170X-Designare	1.0	1.0	

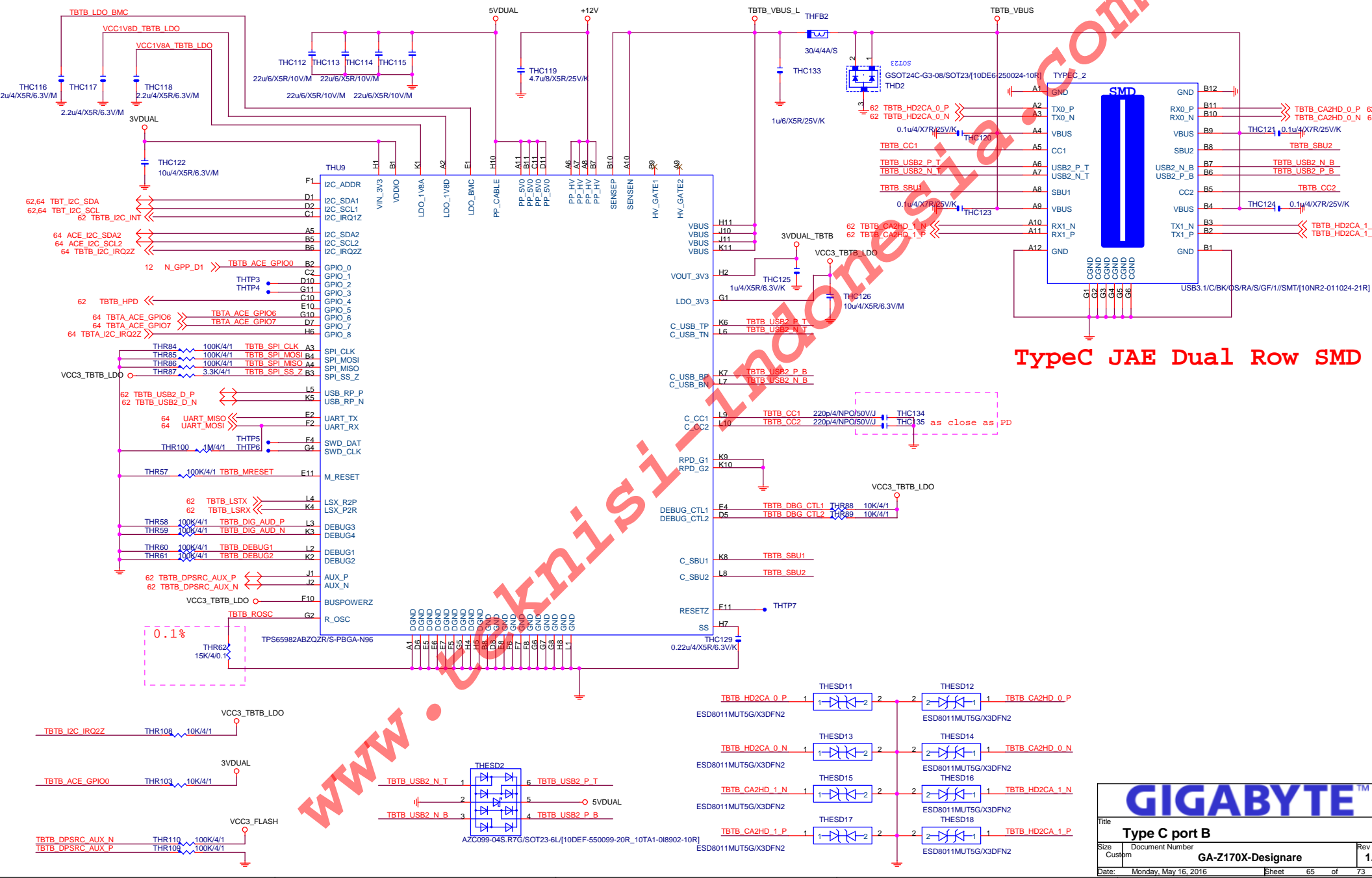


Power Consumption Table					
	VCC3	3VDUAL	VCC3_LC	VCC3V3_ANA_PCIE VCC3V3_ANA_USB2	VCC0V9_LVR_OUT
Max Current(A)	1.05 A 40 mil	0.19 A 10 mil	0.03 A 5 mil	0.1 A 5 mil	0.06 A 5 mil
	VCC0V9_SVR	VCC0V9_DP	VCC0V9_PCIE	VCC0V9_USB	VCC0V9_CIO
Max Current(A)	1.83 A 80 mil	0.7 A 30 mil	0.58 A 30 mil	0.22 A 15 mil	0.28 A 15 mil



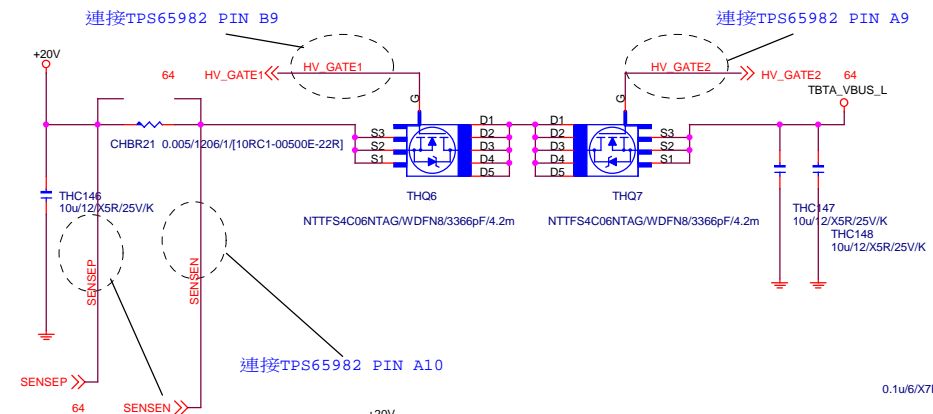
Base on INTEL AR reference SCH 1.01 (2015/05/13)





TypeC JAE Dual Row SMD

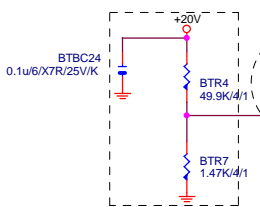
GIGABYTE™		
Title Type C port B		
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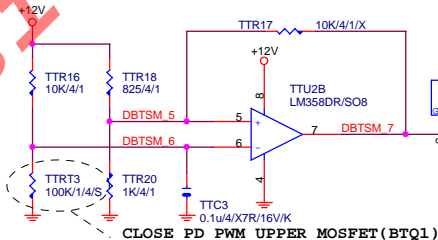
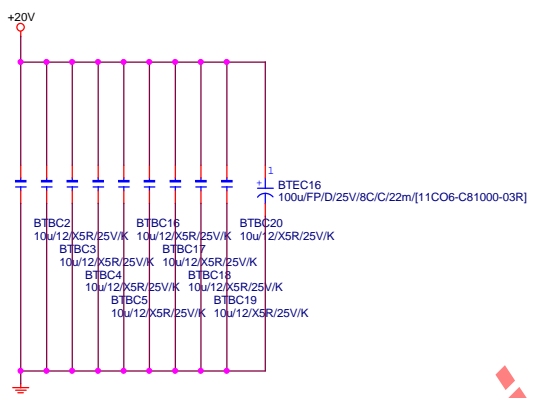
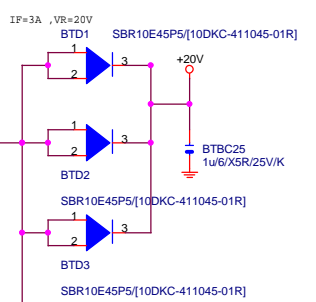
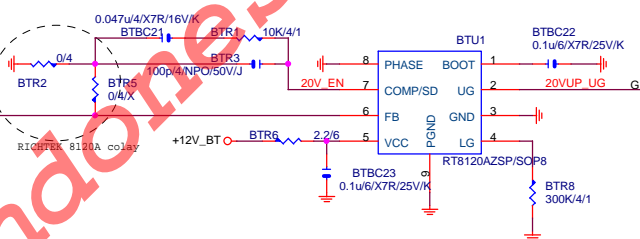
$L=0.5\mu$   
 $DCR=1.05\text{ mohm}$   
 $I_{sat}=40A$   
 $I_{dc}=30A$



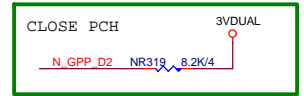
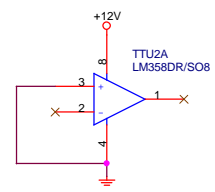
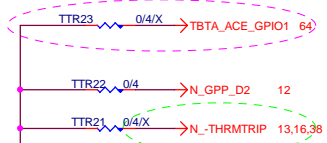
$$0.6 \cdot R2 = (V_{out} - 0.6) \cdot R3 \cdot \frac{BTL1}{2.2uH/40A/INC1310/FBP/D(11LC5-F4220B-21R)}$$



Close to TD4



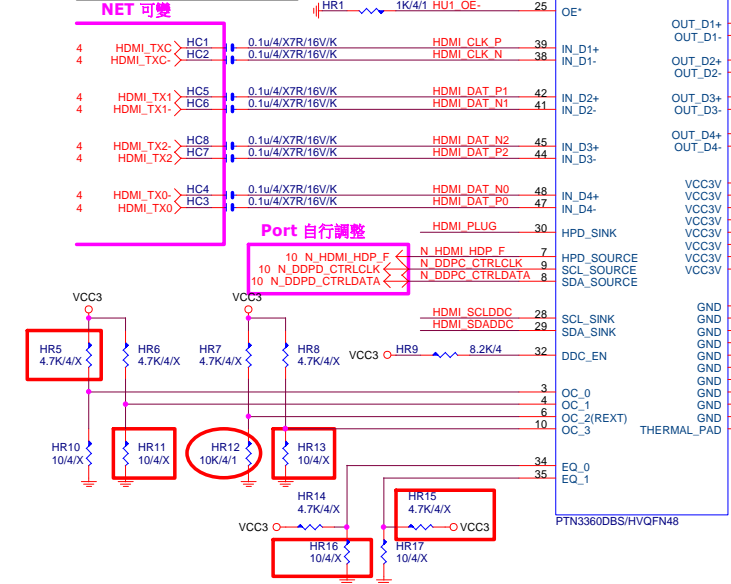
CLOSE PD PWM UPPER MOSFET (BTQ1)



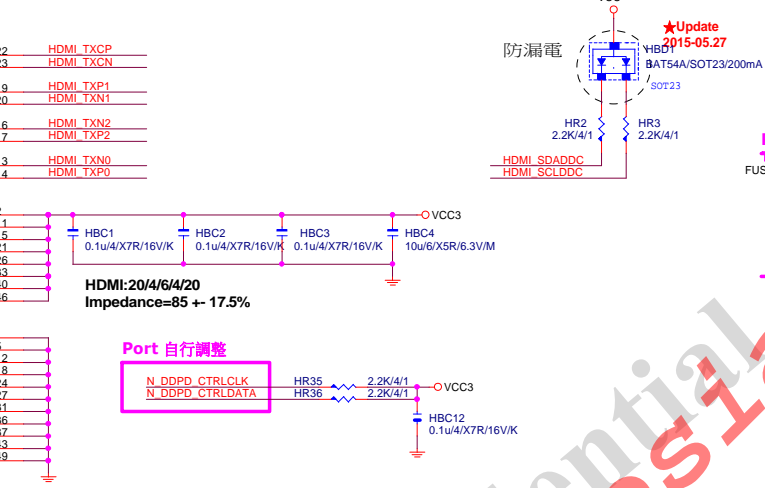
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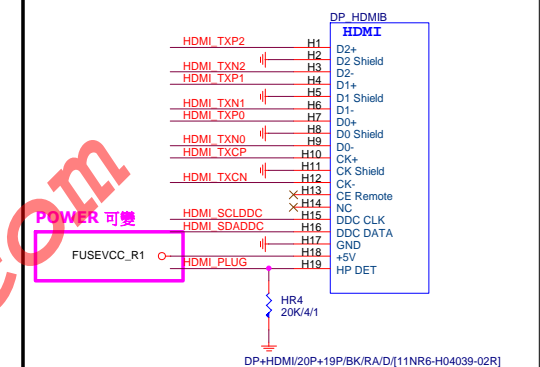
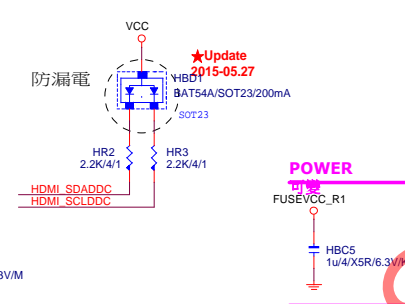
HDMI LEVEL SHIFT



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

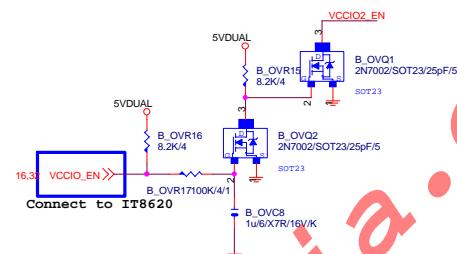


【技術通報R&D技術通報150】  
HDMI eye diagram 1.4版(deep color)會fail  
原因: 因目前的HDMI訊號過長,造成RISING TIME過慢,而會壓到eye diagram  
改善: ASMEDIA ASM1442 : 3.16K(PIN6 PULL DOWN電阻) 10ohm(PIN4 PULL DOWN電阻)

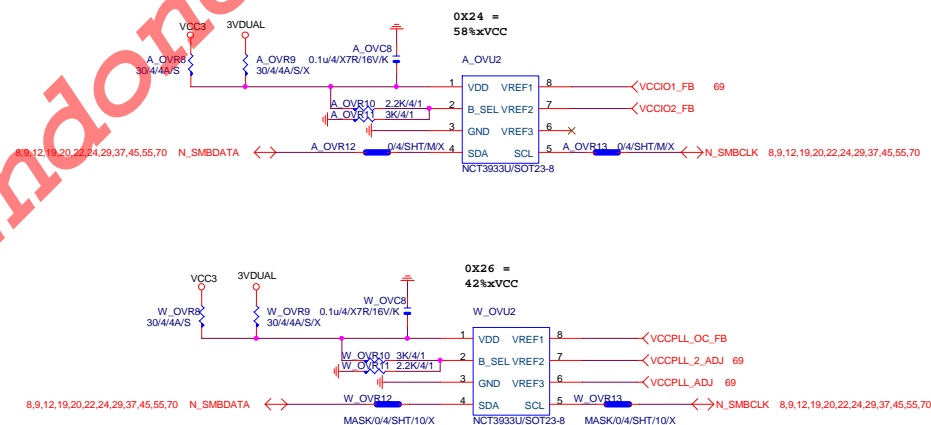


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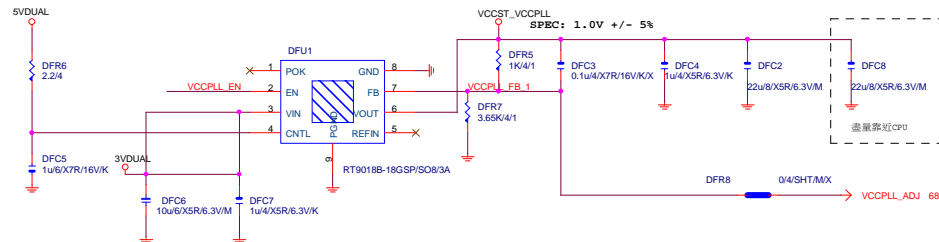
VCCI02



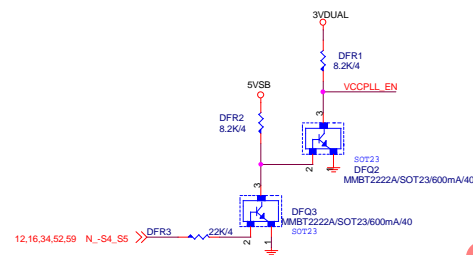
## VCCPLL\_OC



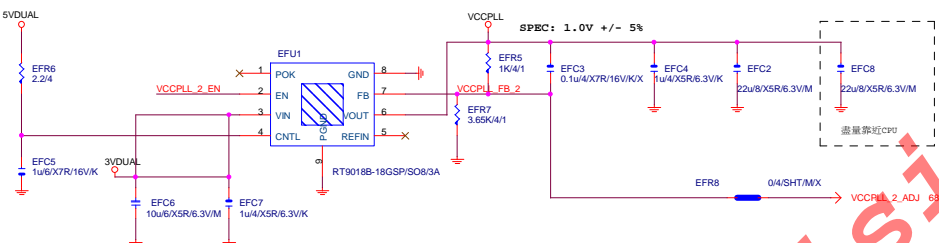
# VCCST\_VCCPLL



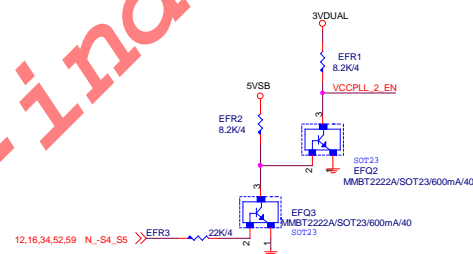
1.0V/ICCMAX:0.11A



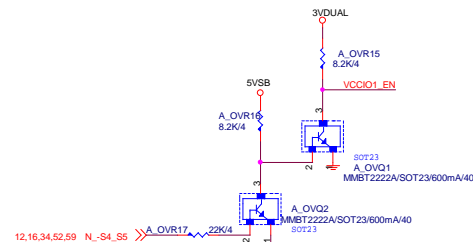
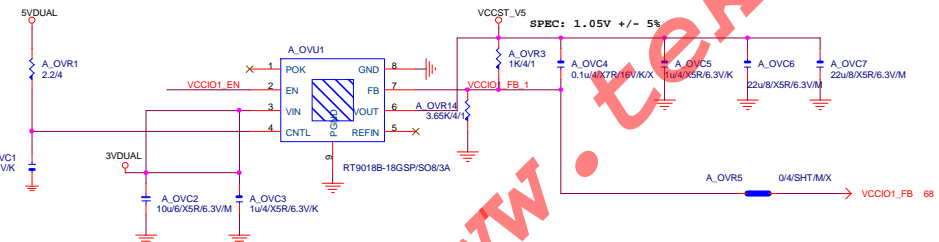
# VCCPLL

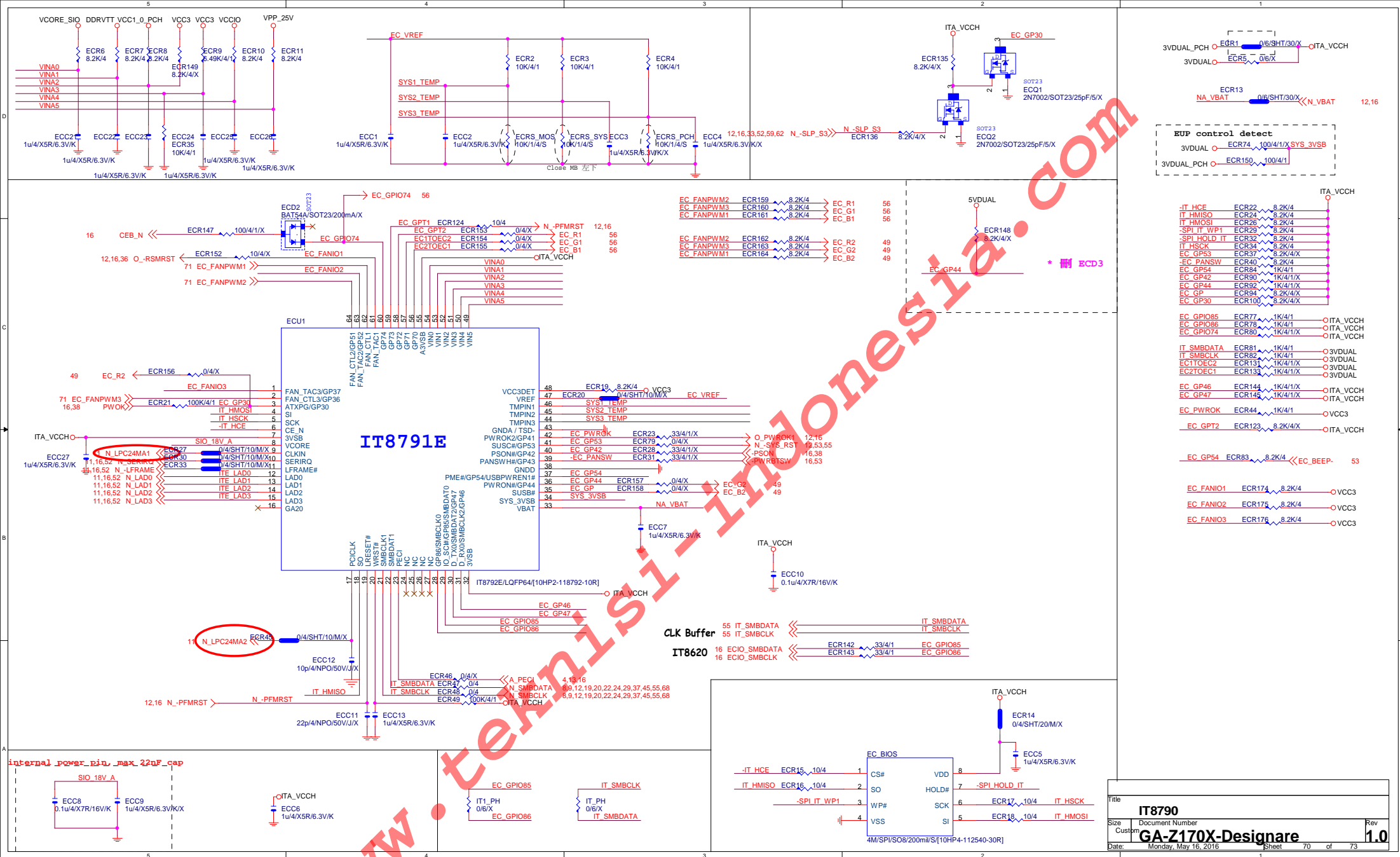


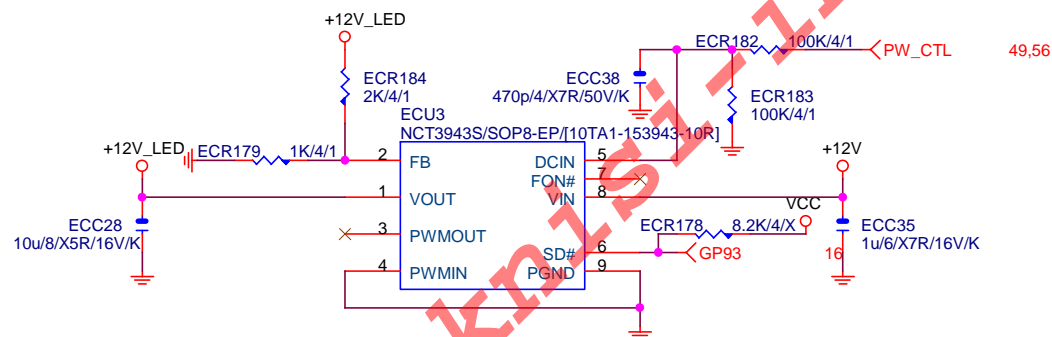
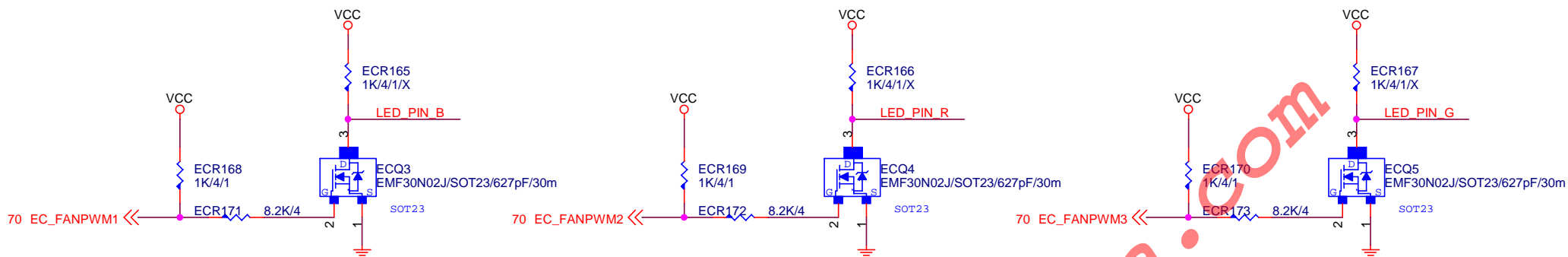
1.0V/ICCMAX:0.11A



# VCCST\_V5

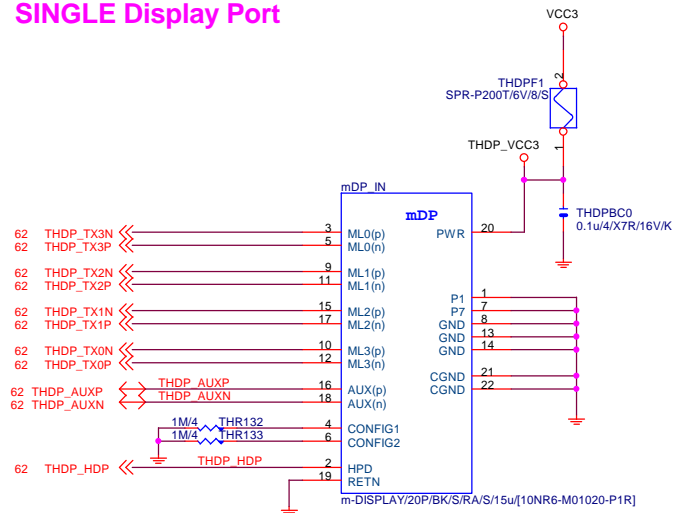




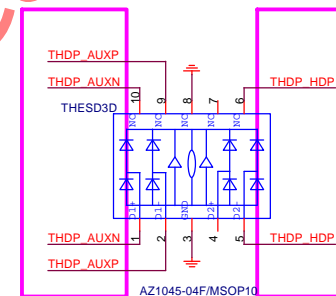
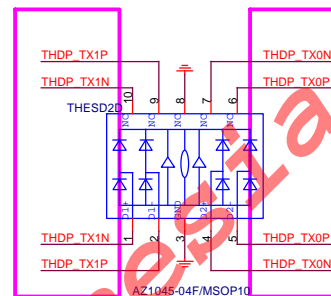
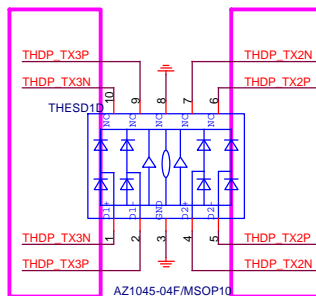


Title		
IT8790		
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# SINGLE Display Port



mini DP



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DISPLAY PORT IN		
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