

Model Name: GA-Q170M-MK rev 1.0

SHEET TITLE

|    |                            |
|----|----------------------------|
| 01 | COVER SHEET                |
| 02 | BOM & PCB MODIFY HISTORY   |
| 03 | BLOCK DIAGRAM              |
| 04 | CPU_LGA1151-A              |
| 05 | CPU_LGA1151-B-DDR4         |
| 06 | CPU_LGA1151-C              |
| 07 | CPU_LGA1150-D              |
| 08 | DDR4 CHANNEL A             |
| 09 | DDR4 CHANNEL B             |
| 10 | PCH_CLK BUFFER             |
| 11 | PCH_DMI,USB,PCIE           |
| 12 | PCH_MISC                   |
| 13 | PCH SATA,PCIE,SATA_EXPRESS |
| 14 | PCH_PWR,GND                |
| 15 | BIOS                       |
| 16 | ITE 8628 LPC IO            |
| 17 | HWM                        |
| 18 | FAN CTRL--SIO              |
| 19 | PCI EXPRESS*16 SLOT        |
| 20 | PCI EXPRESS*4 SLOT(PCH)    |
| 21 | PCI EXPRESS*1 SLOT         |
| 22 | M.2X4                      |
| 23 | SATA EXPRESS               |
| 24 | ISL95858 PWM-IRON          |
| 25 | ISL95858 MOS_VCORE-IRON    |
| 26 | ISL95858 MOS_VCCGT-IRON    |
| 27 | VCCSA_VCCIO_VCCPLL         |
| 28 | RT8120_DDR_VDDQ            |
| 29 | RT8120_VPP25 POWER         |

SHEET TITLE

|    |                            |
|----|----------------------------|
| 30 | RT8120_PCH-CHOKE           |
| 31 | DISCRETE POWER             |
| 32 | NCT3933                    |
| 33 | ATX POWER , A_-PROCHOT     |
| 34 | KB_MS_USB                  |
| 35 | DVI CONN                   |
| 36 | PTN3356 - DP to VGA - IC   |
| 37 | PTN3356 - DP to VGA - Conn |
| 38 | DVI-I,SWITCH,HDMI          |
| 39 | INTEL I219                 |
| 40 | INTEL I211AT               |
| 41 | USB_LAN CONNECTOR          |
| 42 | Realtek ALC887             |
| 43 | MONO SPKR                  |
| 44 | REAR AUDIO JACK            |
| 45 | F_USB30                    |
| 46 | F_USB                      |
| 47 | COM , LPT , TPM , DEBUG    |
| 48 | FP,SPK,BZ                  |
| 49 | EMI-ESD                    |
| 50 | POWER MAP                  |
| 51 | POWER零件使用表                 |
| 52 | TABLE LIST                 |
| 53 | NTC MAP                    |
| 54 |                            |
| 55 |                            |
| 56 |                            |
| 57 |                            |

Gigabyte Technology

|             |                              |       |         |
|-------------|------------------------------|-------|---------|
| Title       |                              |       |         |
| Cover Sheet |                              |       |         |
| Size        | Document Number              | Rev   |         |
| Custom      | GA-Q170M-MK                  | 1.0   |         |
| Date:       | Wednesday, December 09, 2015 | Sheet | 1 of 53 |

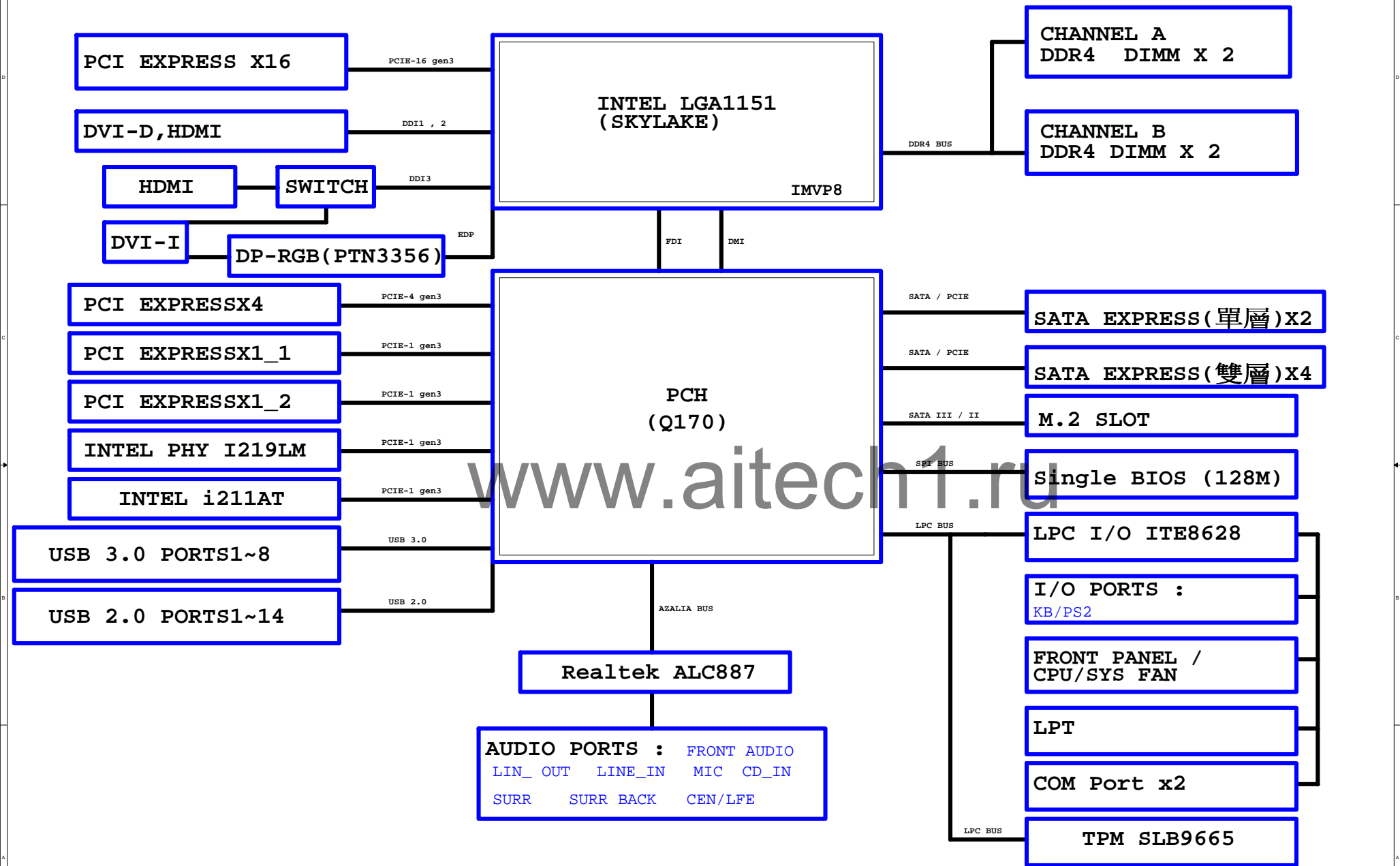
2015/01/23

[illegible]

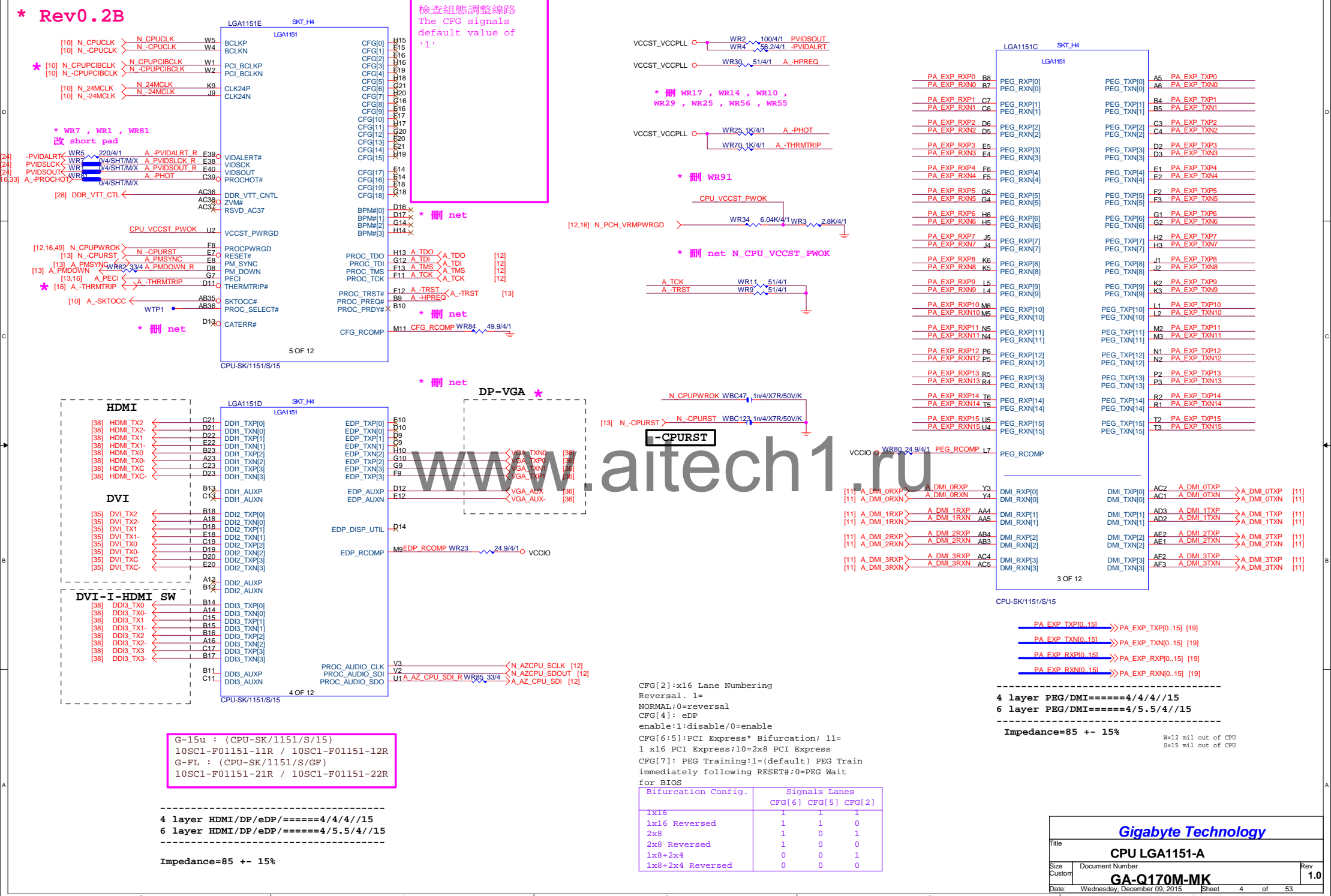
## Circuit or PCB layout change

[illegible]

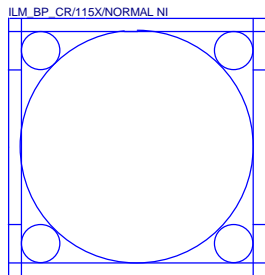
BLOCK DIAGRAM



\* Rev0.2B



# \* 改DDR4 net



Need check the new CPU MB



- [8] MODT\_A[0..3] <=> MODT\_A10..31
- [9] MODT\_B[0..3] <=> MODT\_B10..31
- [8] MDA[0..63] <=> MDA10..631
- [9] MDB[0..63] <=> MDB10..631
- [8] M\_DQSA[0..7] <=> M\_DQSA10..71
- [8] M\_-DQSA[0..7] <=> M\_-DQSA10..71
- [8] MAA[0..16] <=> MAA10..161
- [9] MAB[0..16] <=> MAB10..161
- [9] M\_DQSB[0..7] <=> M\_DQSB10..71
- [9] M\_-DQSB[0..7] <=> M\_-DQSB10..71

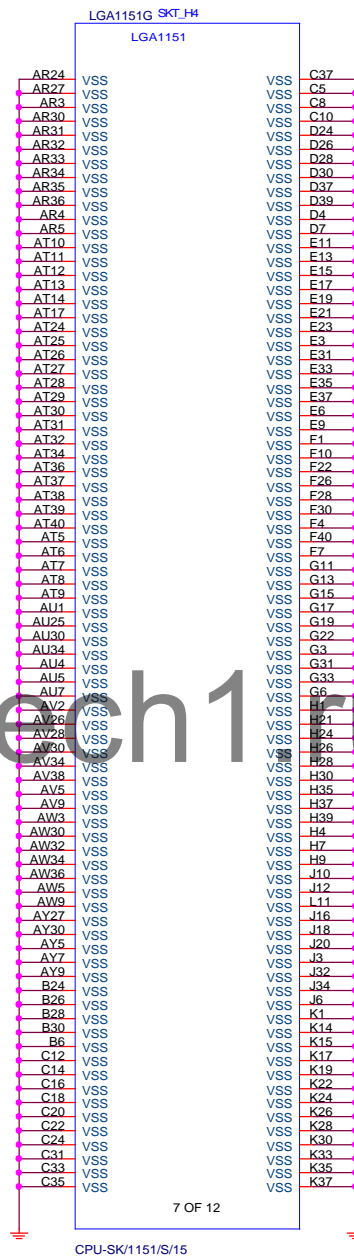
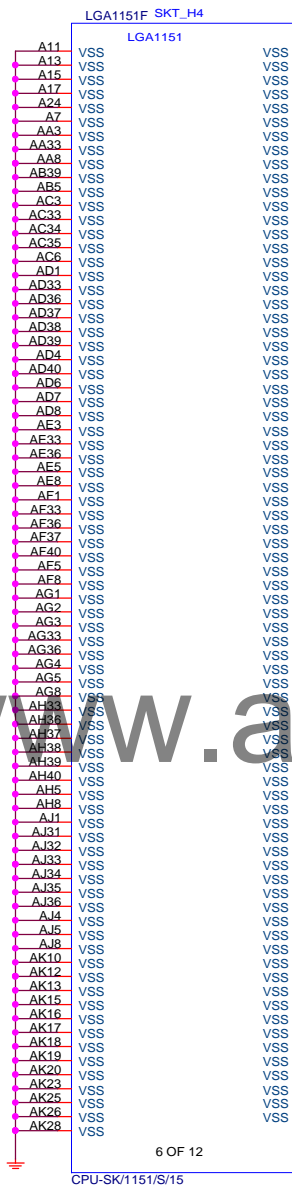
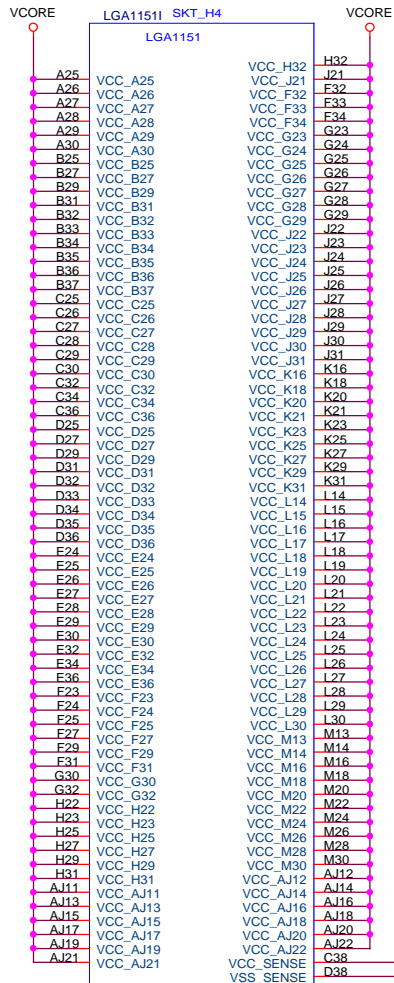
**Gigabyte Technology**

Title: **CPU LGA1151-B**

Size: Custom Document Number: **GA-Q170M-MK** Rev: **1.0**

Date: Wednesday, December 09, 2015 Sheet: 5 of 53



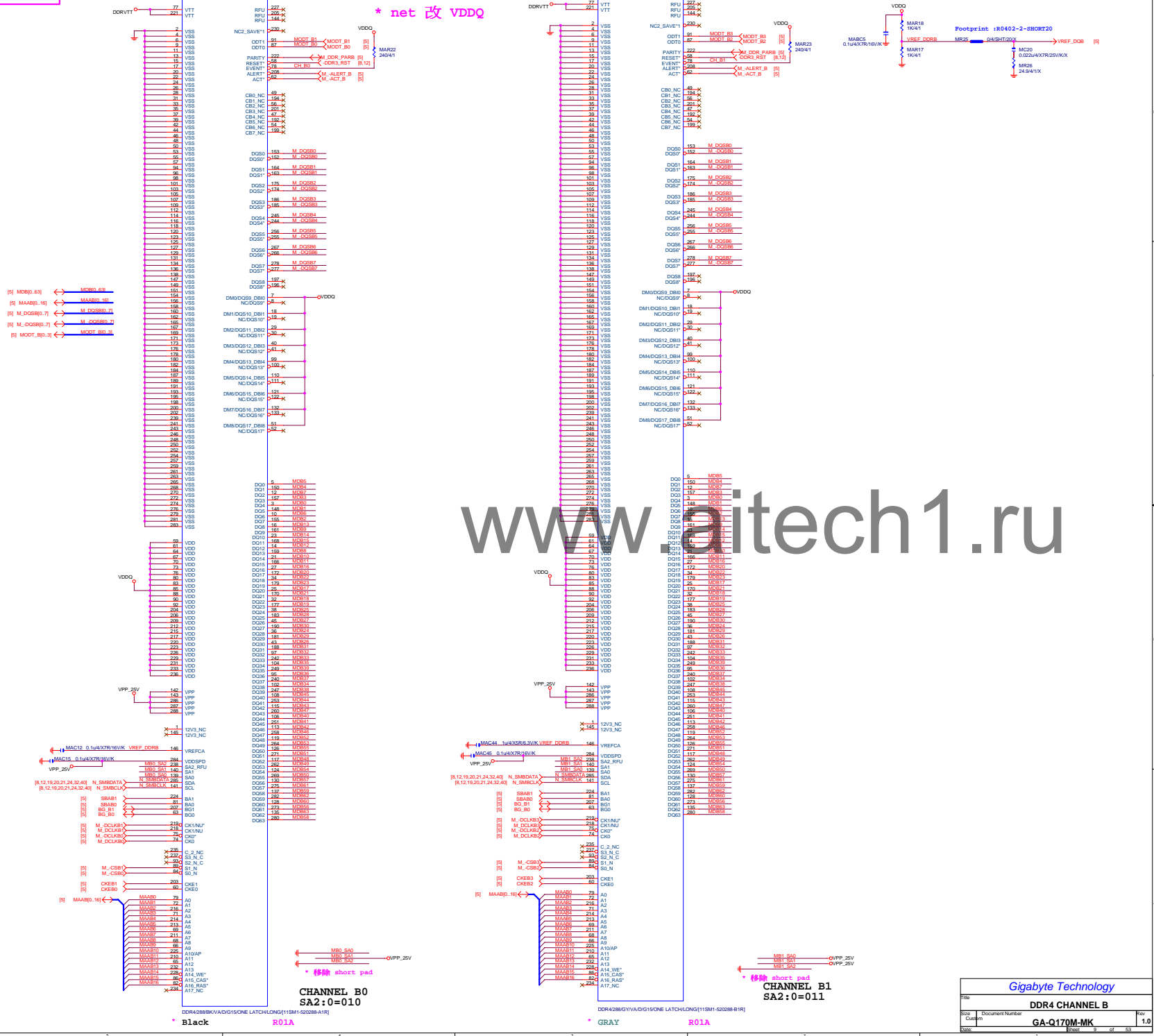


\* 刪 Vcore 電容

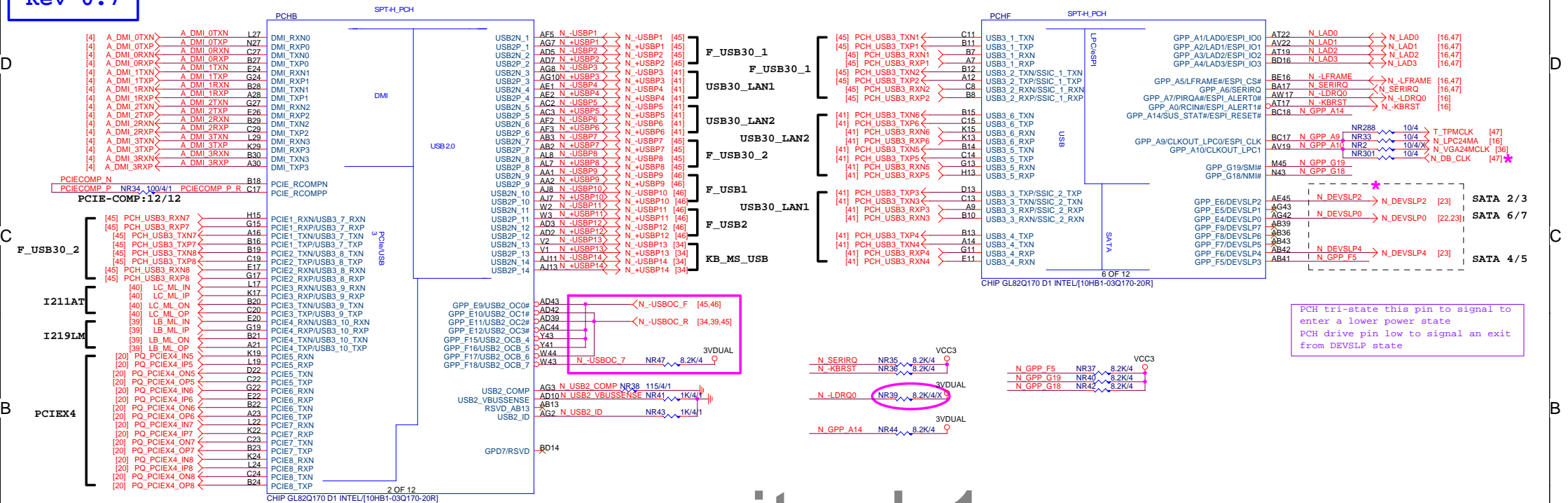








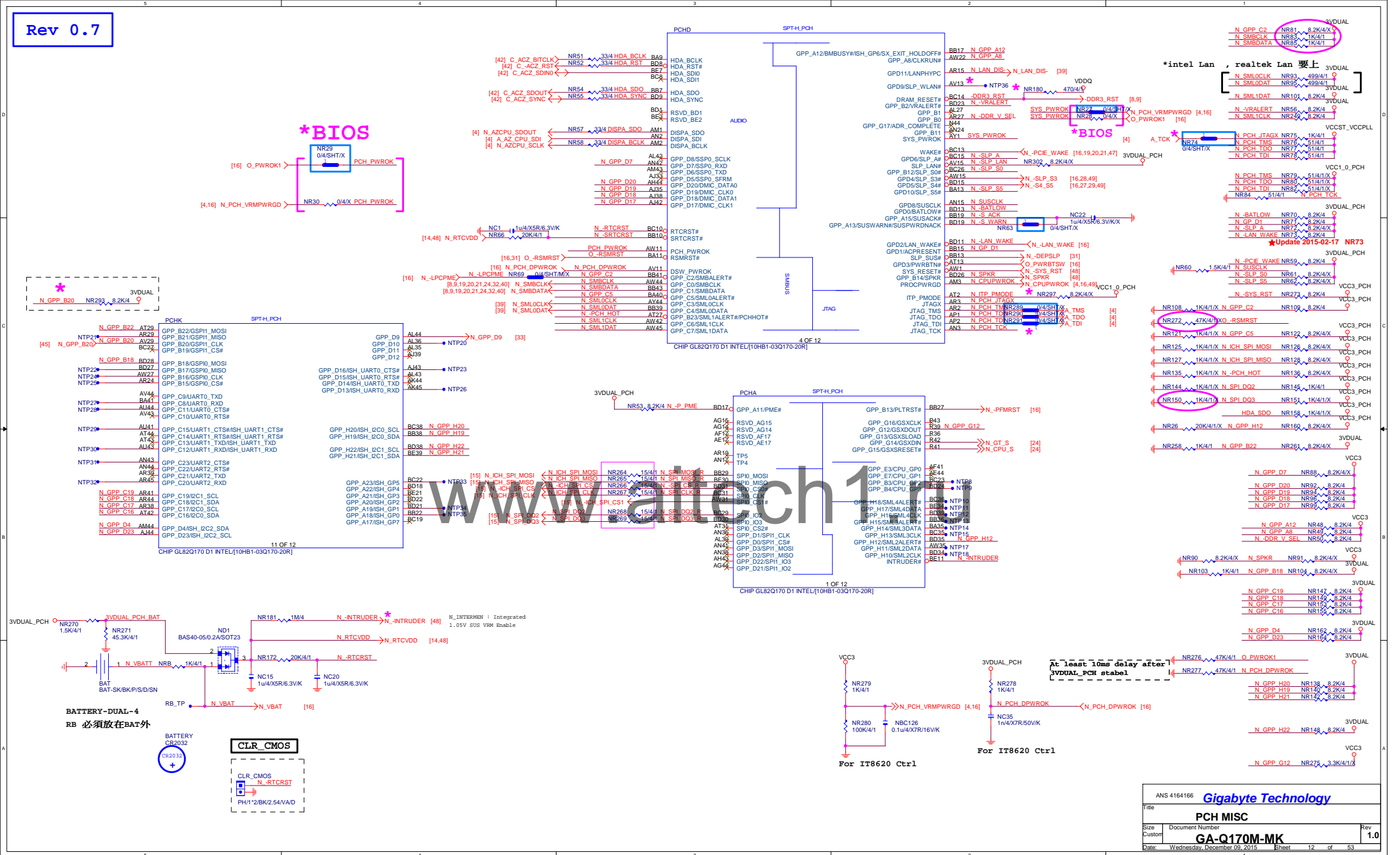




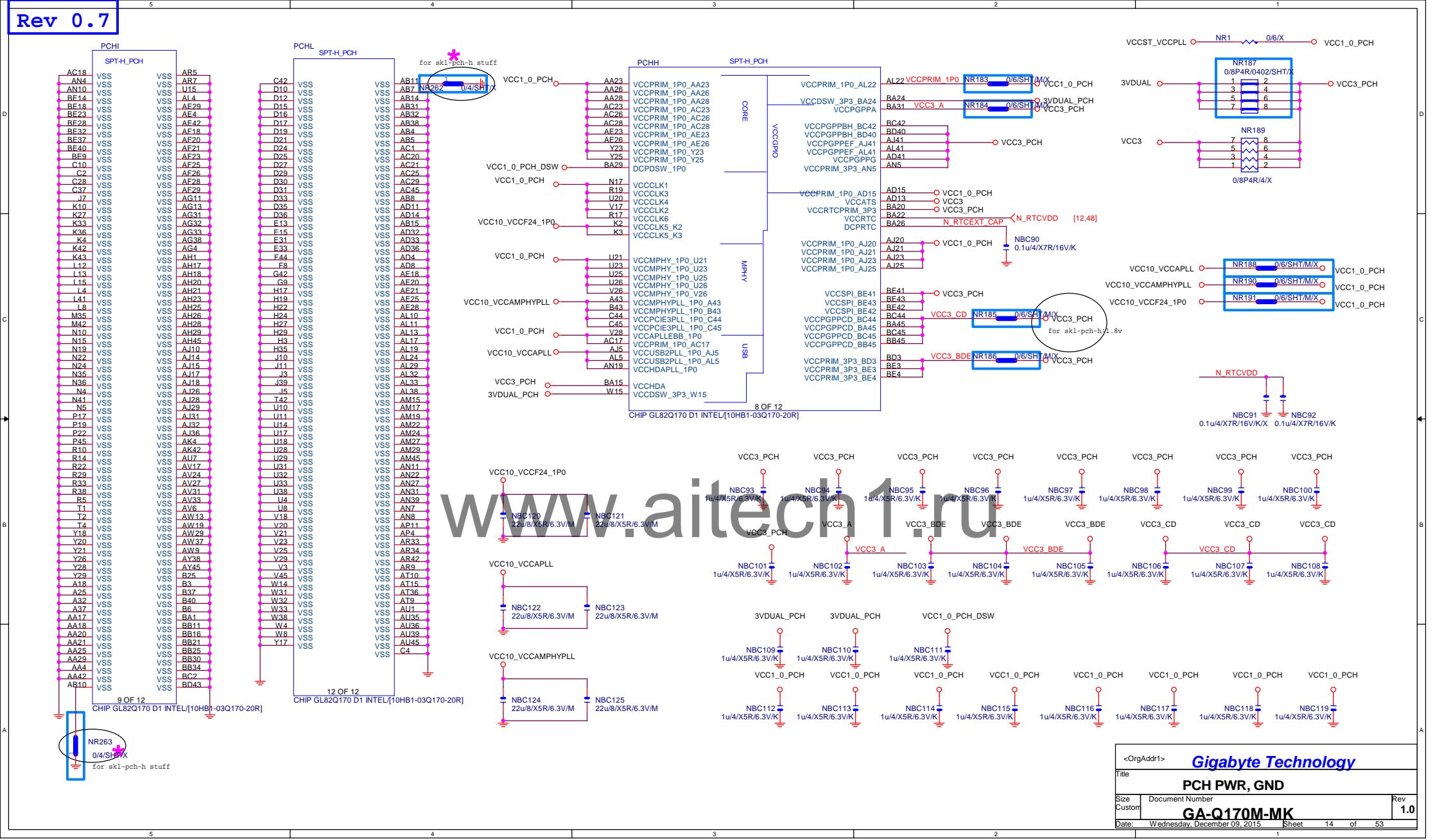
4 layer USB3/USB2/SATA/PCH PCIE=====4/4/4/15  
6 layer USB3/USB2/SATA/PCH PCIE=====4/5.5/4/15

www.aitech1.ru

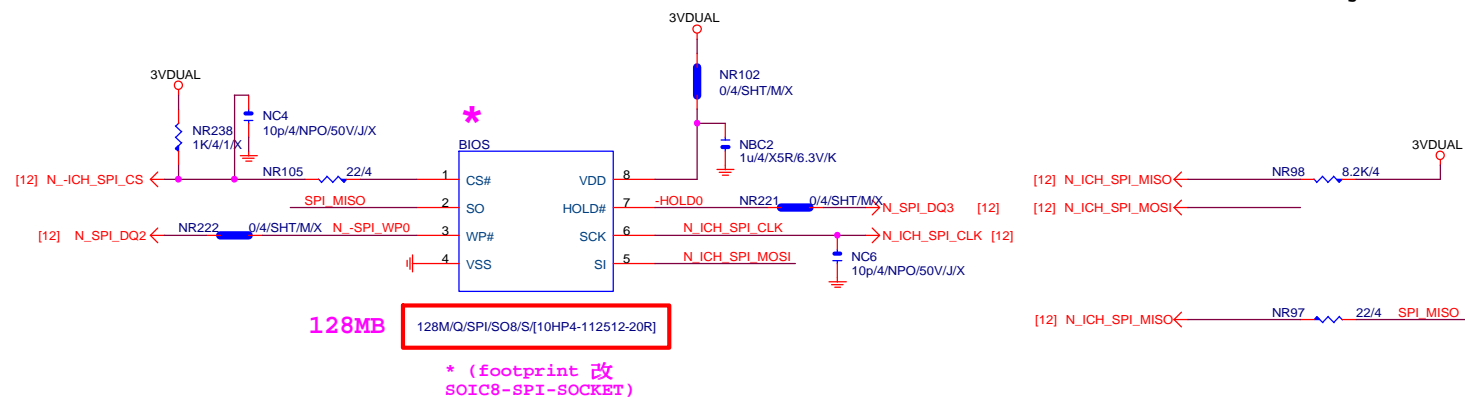
|             |                              |                     |          |
|-------------|------------------------------|---------------------|----------|
| ANS 4164166 |                              | Gigabyte Technology |          |
| Title       |                              | PCH DMI,USB,PCIE    |          |
| Size        | Document Number              | Rev                 | 1.0      |
| Custom      | GA-Q170M-MK                  |                     |          |
| Date:       | Wednesday, December 09, 2015 | Sheet               | 11 of 53 |







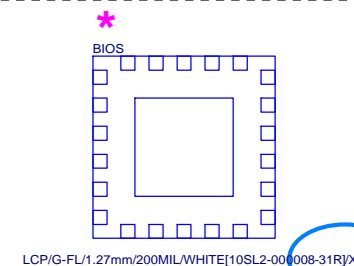




| BOOT<br>DEVICE | GNT0 | GNT1 |
|----------------|------|------|
| LPC            | 0    | 0    |
| PCI            | 0    | 1    |
| NAND           | 1    | 0    |
| SPI            | 1    | 1    |

1 means floating  
0 means PD 1K

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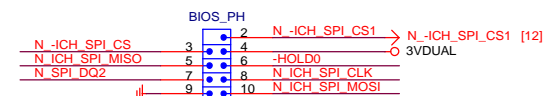


\* 試産先上, PVT 移除

BIOS\_PH

PVT  
改FOOTPRINT 為"BIOS2X5-RH-1-MASK"

★Update  
2015-01.29



MASK/PH/2\*5K10/BK/2.54/VA/D/X  
Footprint the same, confirmed by Graceing.

Use COM port pin header part.

\* 試産先上, PVT mask

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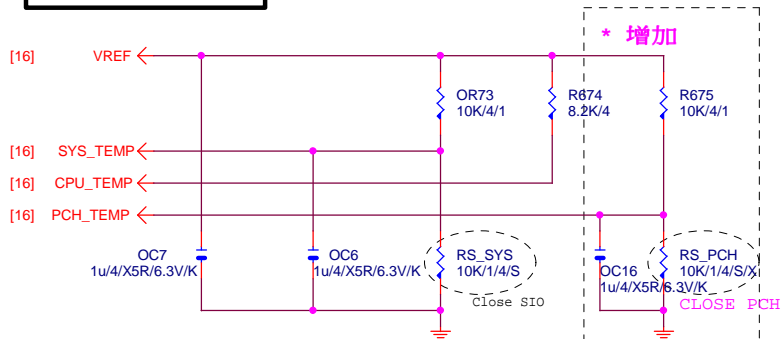
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|--------|------------------------------|-------|-------------|
| Size   | Document Number              | Rev   | GA-Q170M-MK |
| Custom |                              | 1.0   |             |
| Date:  | Wednesday, December 09, 2015 | Sheet | 15 of 53    |





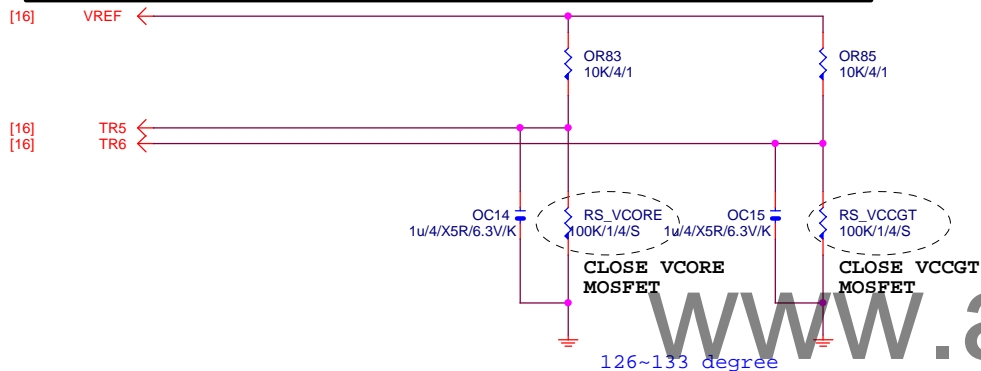
# TEMP H/W MONITOR

REV:1.08



# RS\_VCORE, RS\_VCCGT, CLOSE CPU\_VCORE & VCCGT MOSFET

~~PROCHOT: 有mos heartsink不用prochot function~~

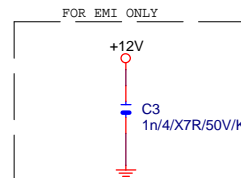
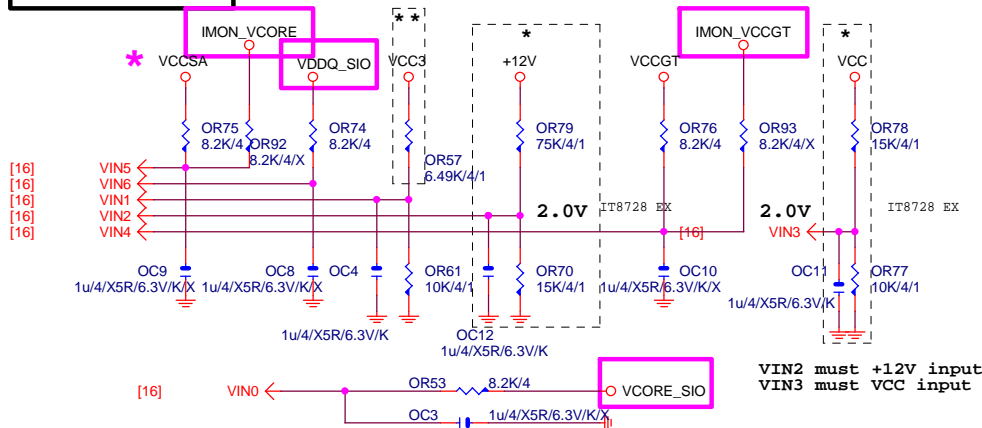


# VOLTAGE-- H/W MONITOR

Connect to PWM

★ IT8728 BX  
★★ IT8728 CX

Connect to PWM



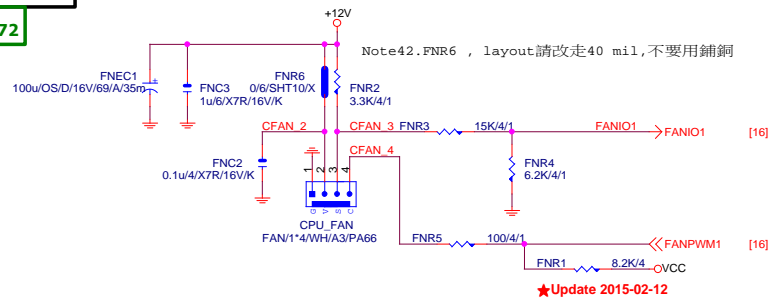
VIN2 must +12V input  
VIN3 must VCC input

Gigabyte Technology

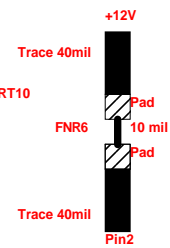
|        |                              |       |                     |       |
|--------|------------------------------|-------|---------------------|-------|
| Title  |                              |       | HWM,KB/MS, FAN CTRL |       |
| Size   | Document Number              |       | Rev                 |       |
| Custom | GA-Q170M-MK                  |       | 1.0                 |       |
| Date:  | Wednesday, December 09, 2015 | Sheet | 17                  | of 53 |

CPU SMART FAN

Rev: 0.72

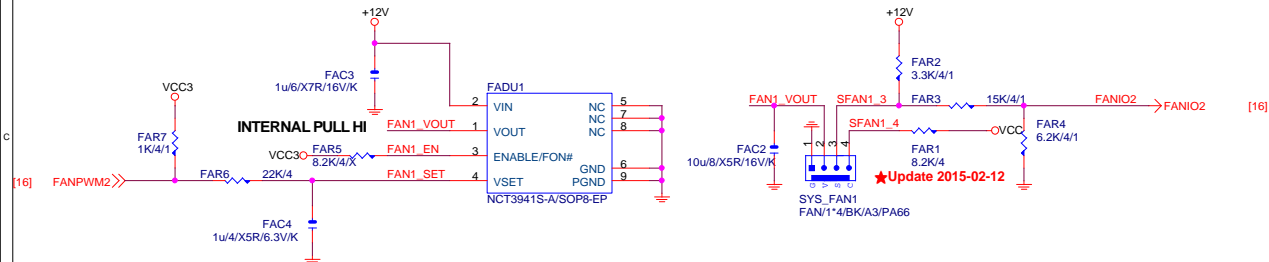


★Update 2015-04.30 FNR6  
footprint: FUSE-0603-SHORT10



SYSTEM FAN1

A.  
Linear SYS\_FAN  
Enable Function (NCT3941S)  
Full Turn On Function (NCT3941S-A)



SYSTEM FAN2

B.

SYSTEM FAN3

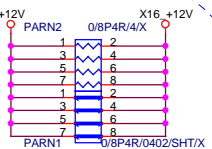
C.

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Gigabyte Technology

|        |                              |       |          |
|--------|------------------------------|-------|----------|
| Title  |                              |       | FAN CTRL |
| Size   | Document Number              | Rev   |          |
| Custom | GA-Q170M-MK                  | 1.0   |          |
| Date:  | Wednesday, December 09, 2015 | Sheet | 18 of 53 |

Rev 0.2

+12V\_protect  
short-wire test

PA\_EXP\_RXP0..15] >> PA\_EXP\_RXP[0..15] [4]  
 PA\_EXP\_RXN0..15] >> PA\_EXP\_RXN[0..15] [4]  
 PA\_EXP\_TXP0..15] >> PA\_EXP\_TXP[0..15] [4]  
 PA\_EXP\_TXN0..15] >> PA\_EXP\_TXN[0..15] [4]

|              |       |                    |                |
|--------------|-------|--------------------|----------------|
| 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_TXP8  | PAC21 | 0.22u/4/X5R/6.3V/K | PA_EXP_TXP8 C  |
| PA_EXP_TXN8  | PAC20 | 0.22u/4/X5R/6.3V/K | PA_EXP_TXN8 C  |
| PA_EXP_TXP9  | PAC22 | 0.22u/4/X5R/6.3V/K | PA_EXP_TXP9 C  |
| PA_EXP_TXN9  | PAC23 | 0.22u/4/X5R/6.3V/K | PA_EXP_TXN9 C  |
| PA_EXP_TXP10 | PAC24 | 0.22u/4/X5R/6.3V/K | PA_EXP_TXP10 C |
| PA_EXP_TXN10 | PAC25 | 0.22u/4/X5R/6.3V/K | PA_EXP_TXN10 C |
| PA_EXP_TXP11 | PAC26 | 0.22u/4/X5R/6.3V/K | PA_EXP_TXP11 C |
| PA_EXP_TXN11 | PAC27 | 0.22u/4/X5R/6.3V/K | PA_EXP_TXN11 C |
| PA_EXP_TXP12 | PAC28 | 0.22u/4/X5R/6.3V/K | PA_EXP_TXP12 C |
| PA_EXP_TXN12 | PAC29 | 0.22u/4/X5R/6.3V/K | PA_EXP_TXN12 C |
| PA_EXP_TXP13 | PAC30 | 0.22u/4/X5R/6.3V/K | PA_EXP_TXP13 C |
| PA_EXP_TXN13 | PAC31 | 0.22u/4/X5R/6.3V/K | PA_EXP_TXN13 C |
| PA_EXP_TXP14 | PAC32 | 0.22u/4/X5R/6.3V/K | PA_EXP_TXP14 C |
| PA_EXP_TXN14 | PAC33 | 0.22u/4/X5R/6.3V/K | PA_EXP_TXN14 C |
| PA_EXP_TXP15 | PAC34 | 0.22u/4/X5R/6.3V/K | PA_EXP_TXP15 C |
| PA_EXP_TXN15 | PAC35 | 0.22u/4/X5R/6.3V/K | PA_EXP_TXN15 C |

PCIEX16:16/5/5/5/16

PCI-E REV:1.1--&gt; 2.5GHZ

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

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

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

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

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

Footprint : PCIESLOT-164P

3GIO\_\*16

[8,9,12,20,21,24,32,40] N\_SMBCLK  
[8,9,12,20,21,24,32,40] N\_SMBDATA

[12,16,20,21,47] N\_-PCIE\_WAKE

[10] -PCIEX16\_PR

PA\_EXP\_TXP1 C

PA\_EXP\_TXN1 C

PA\_EXP\_TXP2 C

PA\_EXP\_TXN2 C

PA\_EXP\_TXP3 C

PA\_EXP\_TXN3 C

PA\_EXP\_TXP4 C

PA\_EXP\_TXN4 C

PA\_EXP\_TXP5 C

PA\_EXP\_TXN5 C

PA\_EXP\_TXP6 C

PA\_EXP\_TXN6 C

PA\_EXP\_TXP7 C

PA\_EXP\_TXN7 C

PA\_EXP\_TXP8 C

PA\_EXP\_TXN8 C

PA\_EXP\_TXP9 C

PA\_EXP\_TXN9 C

PA\_EXP\_TXP10 C

PA\_EXP\_TXN10 C

PA\_EXP\_TXP11 C

PA\_EXP\_TXN11 C

PA\_EXP\_TXP12 C

PA\_EXP\_TXN12 C

PA\_EXP\_TXP13 C

PA\_EXP\_TXN13 C

PA\_EXP\_TXP14 C

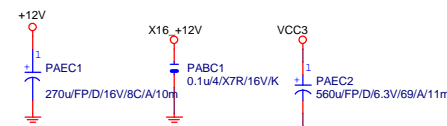
PA\_EXP\_TXN14 C

PA\_EXP\_TXP15 C

PA\_EXP\_TXN15 C

PCI-E/16X-164P/GY/LONG DOUBLE/HK\*2

R01A

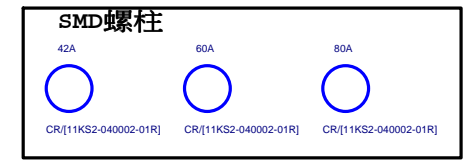
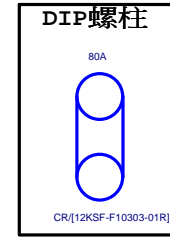
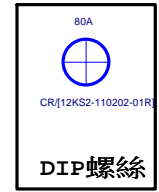
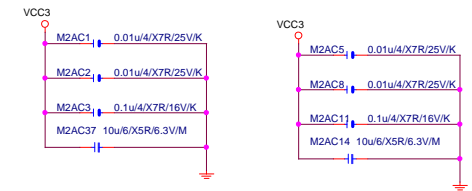
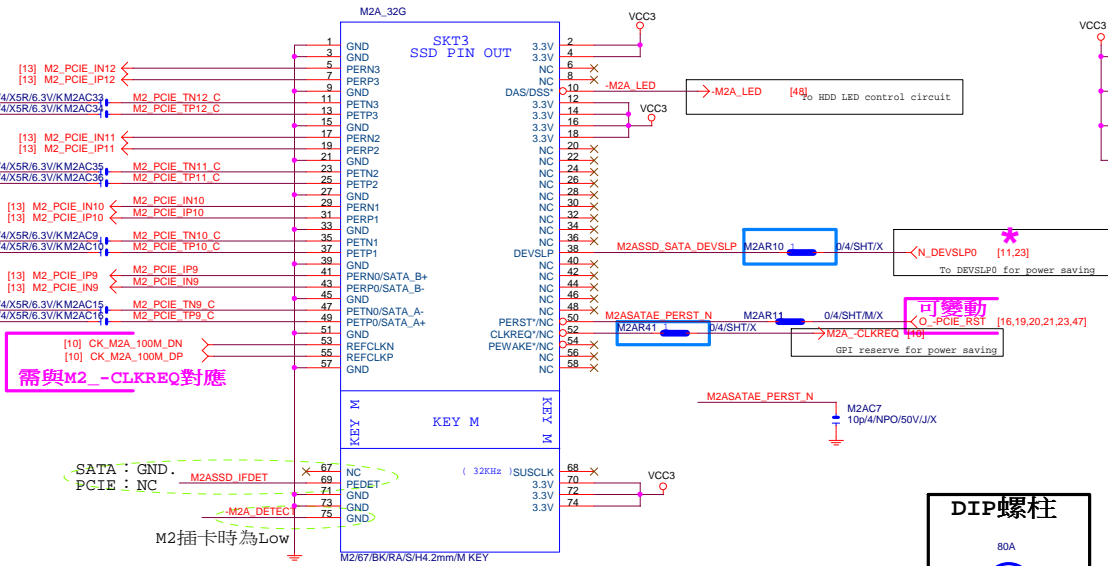
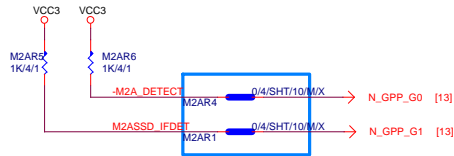


|                     |                              |                |
|---------------------|------------------------------|----------------|
| Gigabyte Technology |                              |                |
| Title               |                              |                |
| PCI EXPRESS * 16    |                              |                |
| Size                | Document Number              | Rev            |
| Custom              | GA-Q170M-MK                  | 1.0            |
| Date:               | Wednesday, December 09, 2015 | Sheet 19 of 53 |





支援SATA and M.2 function



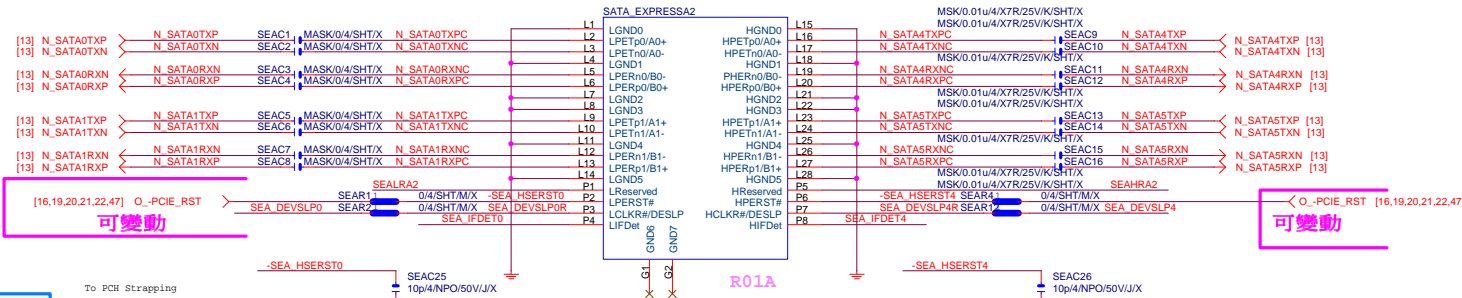
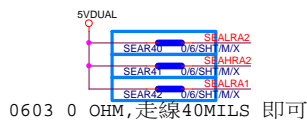
| M.2<br>有插卡<br>/沒插卡<br>GPP_G0 | M.2插何種卡？<br>GPP_G1 | SATA Express<br>插何種硬碟？<br>GPP_E0/E2/F1 | I/O15<br>(S0)        | I/O16<br>(S1) | I/O17      | I/O18      | I/O19<br>(S0) | I/O20<br>(S1) |
|------------------------------|--------------------|--|----------------------|---------------|------------|------------|---------------|---------------|
| 有插卡<br>(Low)                 | SATA Mode<br>(Low) | SATA<br>(Hi)                           | SATA<br>(M.2)        | PCIe<br>x1    | PCIe<br>x1 | PCIe<br>x1 | PCIe<br>x1    | SATA          |
|                              |                    | SATA Express<br>(Low)                  | SATA<br>(M.2)        | PCIe<br>x1    | PCIe<br>x1 | PCIe<br>x1 | SATA Express  |               |
|                              | PCIe Mode<br>(Hi)  | SATA<br>(Hi)                           | PCIe x4<br>(For M.2) |               |            |            | SATA          | SATA          |
|                              |                    | SATA Express<br>(Low)                  | PCIe x4<br>(For M.2) |               |            |            | SATA Express  |               |
| 沒插卡<br>(Hi)                  | Don't Care<br>(Hi) | SATA<br>(Hi)                           | PCIe x4              |               |            |            | SATA          | SATA          |
|                              |                    | SATA Express<br>(Low)                  | PCIe x4              |               |            |            | SATA Express  |               |



DUAL LAYOUT(Z170/H170~ONLY SATA4,5)

SATA EXPRESS 下層 To SATA3  
port0/1

SATA EXPRESS 上層 To SATA3  
port4/5



Capture Value 用上層封孔暫代

```
* check
文字面 01/23/45
NET (45/23/01)
```

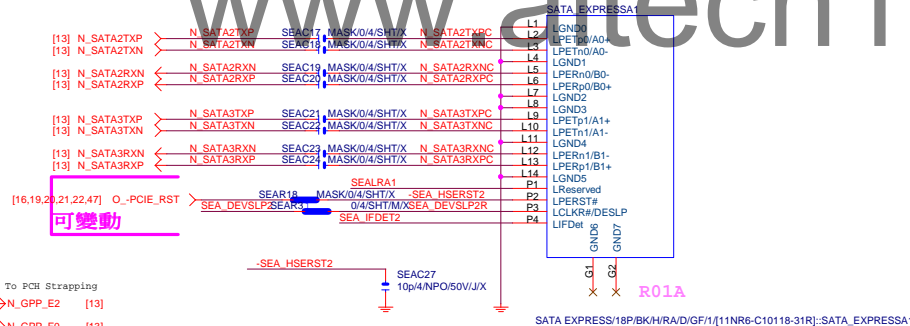
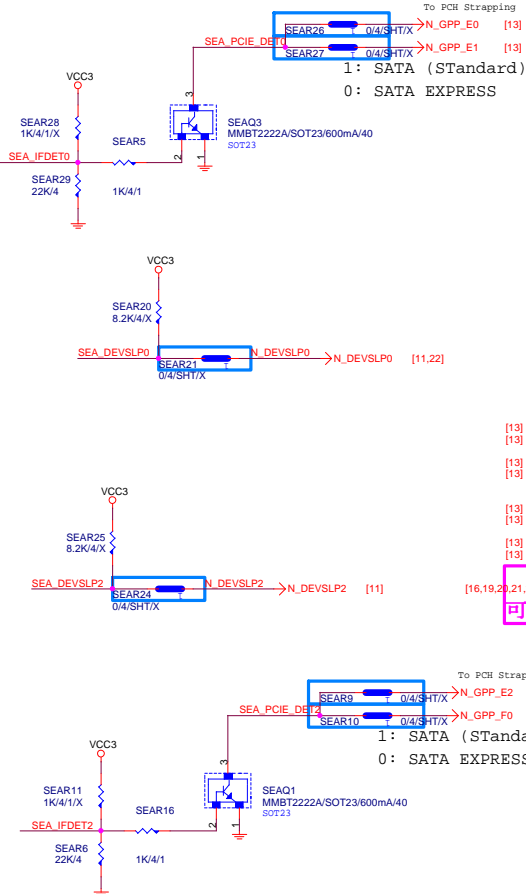
SATA EXPRESS料號

Z170雙層:TBD

H170單層+2SATA:11NR6-C10236-03R

單層:11NR6-C10118-03R

To SATA3  
port2/3



|        |              |
|--------|--------------|
| SATA 5 | (文字面寫SATA 1) |
| SATA 4 | (文字面寫SATA 0) |
| SATA 3 |              |
| SATA 2 |              |
| SATA 1 | (文字面寫SATA 5) |
| SATA 0 | (文字面寫SATA 4) |

DUAL LAYOUT(Z170/H170~ONLY SATA4,5)

SATA EXPRESS 訊號

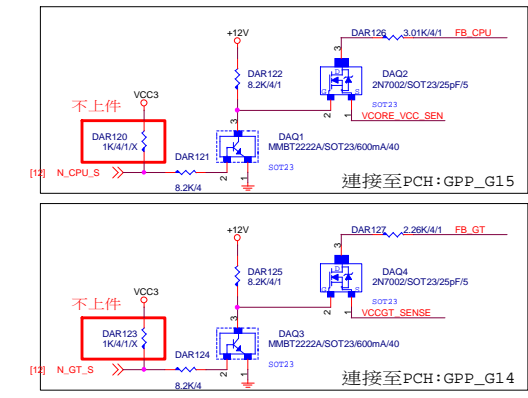
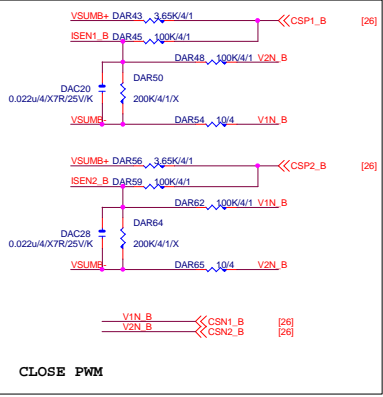
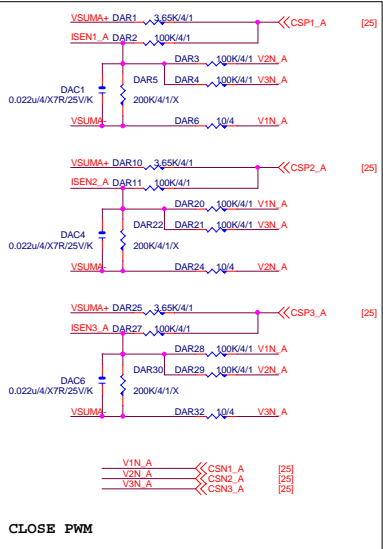
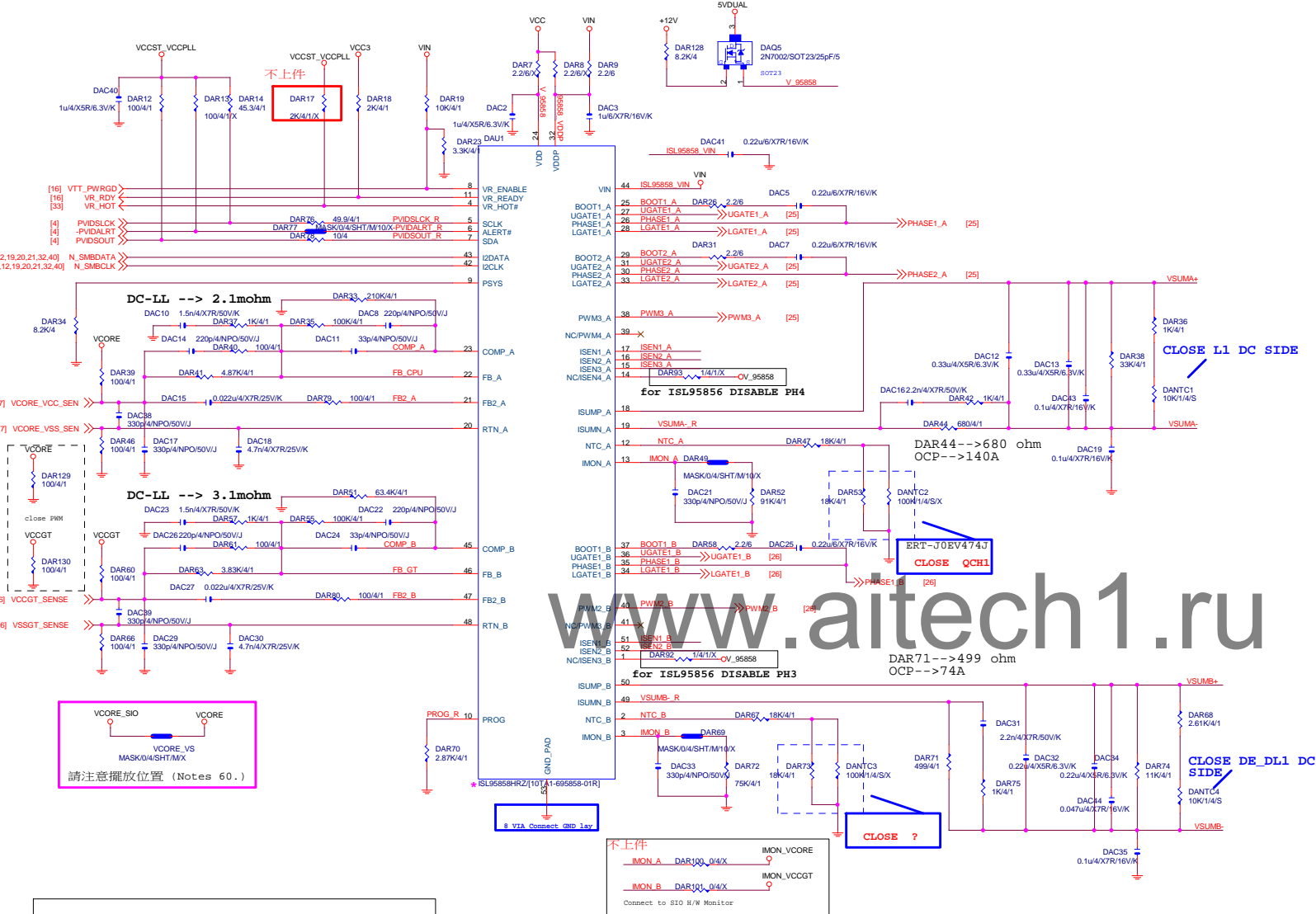
|        |        |
|--------|--------|
| SATA 5 | SATA 4 |
| SATA 1 | SATA 0 |

SATA EXPRESS 文字面

|        |        |        |        |
|--------|--------|--------|--------|
| SATA 3 | SATA 2 |        |        |
| SATA 5 | SATA 4 | SATA 1 | SATA 0 |

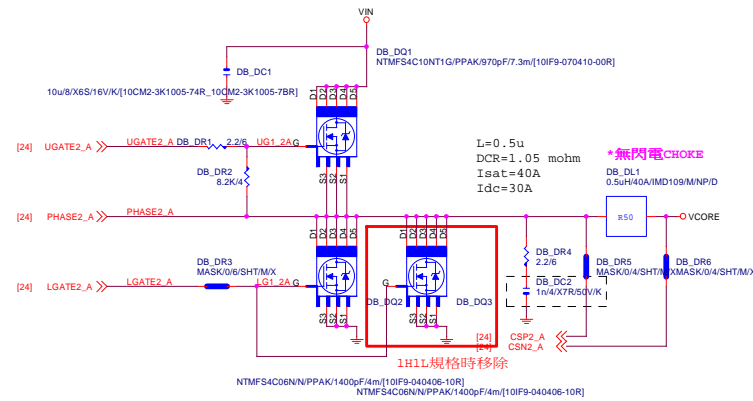
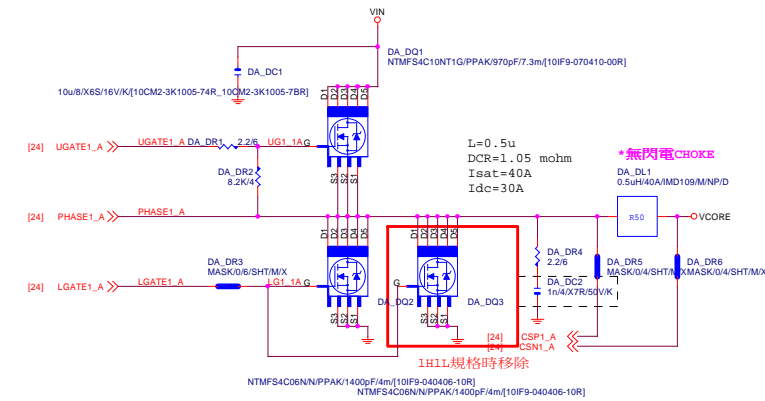
文字面要寫建議 user使用順序  
SATA : 2->5->1->4->3->0

|                                   |                              |       |            |
|-----------------------------------|------------------------------|-------|------------|
|                                   |                              |       |            |
| <b><i>Gigabyte Technology</i></b> |                              |       |            |
| Title                             |                              |       |            |
| <b>SATA EXPRESS</b>               |                              |       |            |
| Size                              | Document Number              |       | Rev        |
| Custom                            | <b>GA-Q170M-MK</b>           |       | <b>1.0</b> |
| Date:                             | Wednesday, December 09, 2015 | Sheet | 23 of 53   |

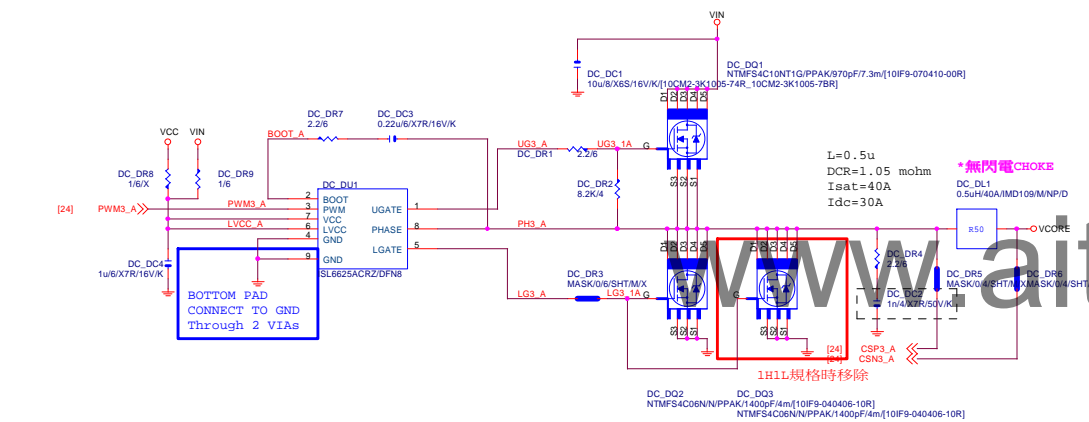
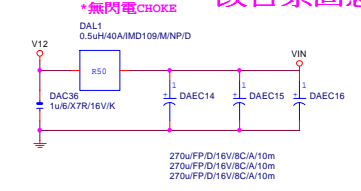


REV:0.94

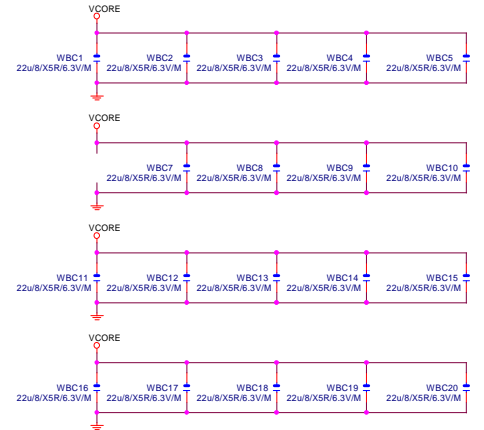
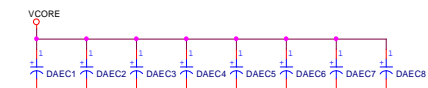
# VCORE \*限用 MOS



## VIN CAP 270u\*3PCS \*改台系固態電容

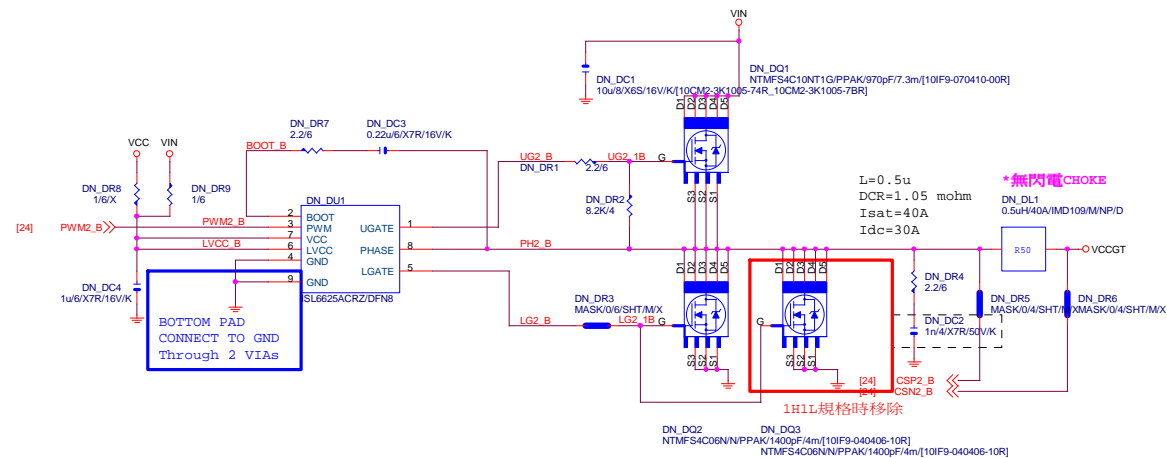
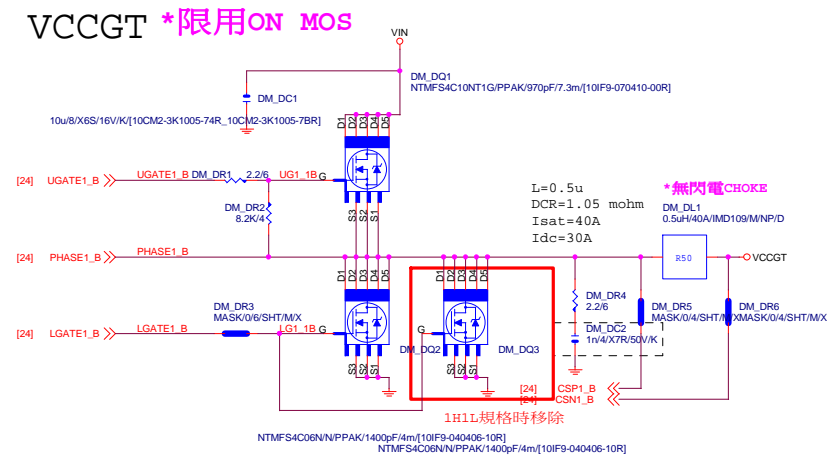


## VCORE CAP 560u\*8PCS 22u\*29PCS \*改台系固態電容

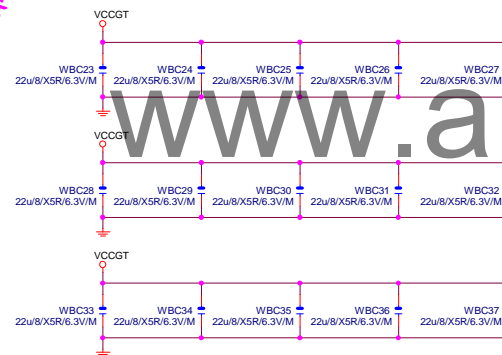
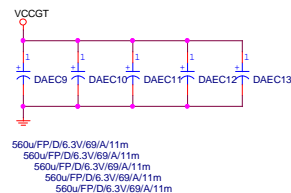


| GIGABYTE™    |                              |       |          |
|--------------|------------------------------|-------|----------|
| ISL95858 MOS |                              |       |          |
| Size         | Document Number              | Rev   |          |
| Custm        | GA-Q170M-MK                  | 1.0   |          |
| Date:        | Wednesday, December 09, 2015 | Sheet | 25 of 53 |

VCCGT \*限用ON MOS



VCCGT CAP \*改台系固態電容  
560u\*5PCS  
22u\*15PCS

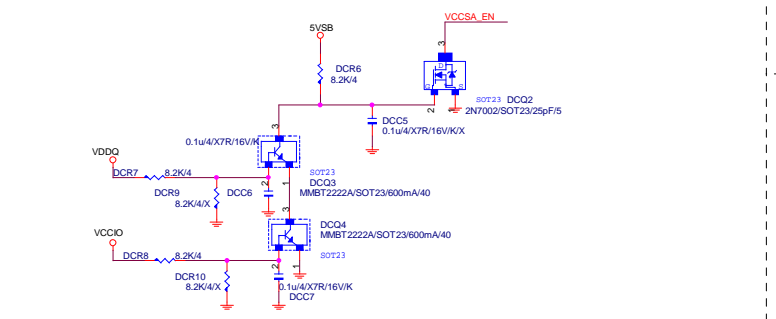
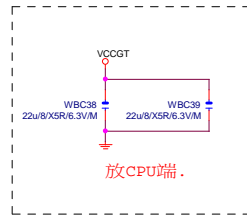
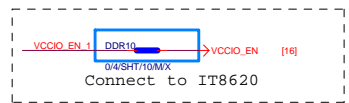
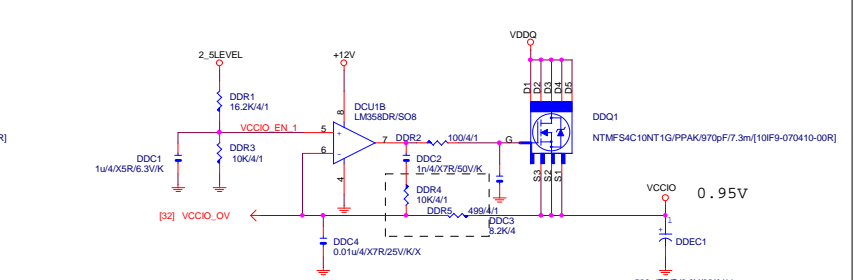
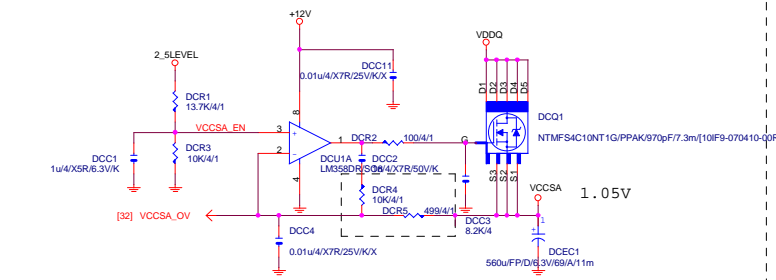


WBC24 22u8/X5R6.3V/M WBC25 22u8/X5R6.3V/M WBC26 22u8/X5R6.3V/M WBC27 22u8/X5R6.3V/M

VCCSA

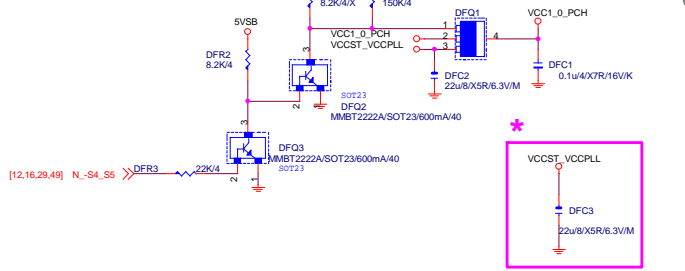
REV:0.4

VCCIO



REV:0.22

VCCST\_VCCPLL



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## REV:0.9



請注意擺放位置 (Notes 31)

1.2V

L=1u  
DCR=2.5 mohm  
Isat=35A  
Idc=28A

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

**For power sequence require**

For power sequence require

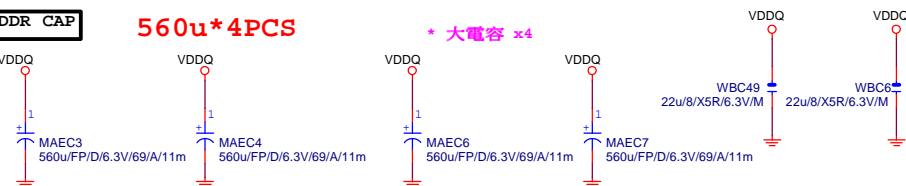
[16,29] MA\_EN >> MAR10

Connect to IT8620

Connect to IT8620

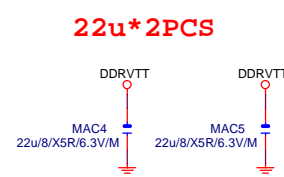
560u\*4PCS

\* 大電容 x4



22u\*2PCS

\* 大電容 xC



MAC1  
0.01u/4/X7R/25V/K

DDR\_VTT\_CTL MAR110 0/4 DDRVTT\_EN  
N\_SLP\_S3 MAR111 0/4 DDRVTT\_BOOT

MAU1上NCT3103S時上件

MAU1上NCT3103S時上件

**GIGABYTE™**

|       |                  |
|-------|------------------|
| Title | RT8120_DDR_POWER |
|-------|------------------|

|        |                    |
|--------|--------------------|
| Size   | Document Number    |
| Custom | <b>GA-Q170M-MK</b> |

Date: Wednesday, December 09, 2015 Sheet 28 of 53

|                                    |       |    |    |    |
|------------------------------------|-------|----|----|----|
| Date: Wednesday, December 06, 2018 | Sheet | 20 | 01 | 00 |
| 2                                  |       | 1  |    |    |

**VPP 25V**

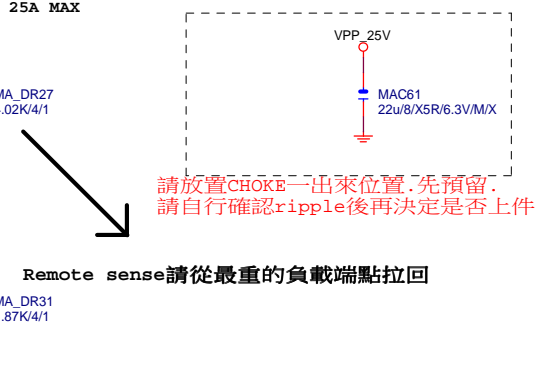
## CHOKES與CAP料號可變

L=1u  
DCR=3.2 mohm  
Isat=18A  
Idc=15A

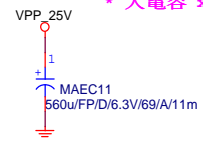
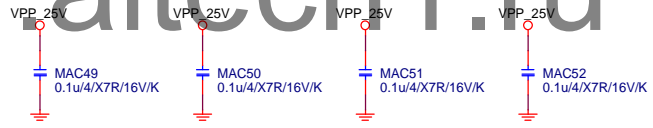
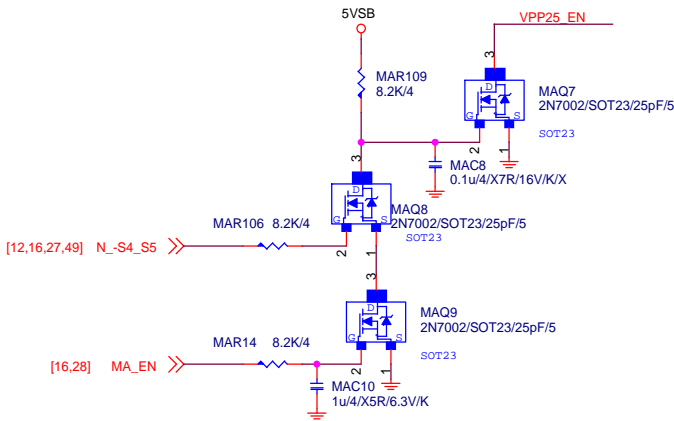
請放置CHOKE一出來位置.先預留.  
請自行確認ripple後再決定是否上件

\* 大電容 x1

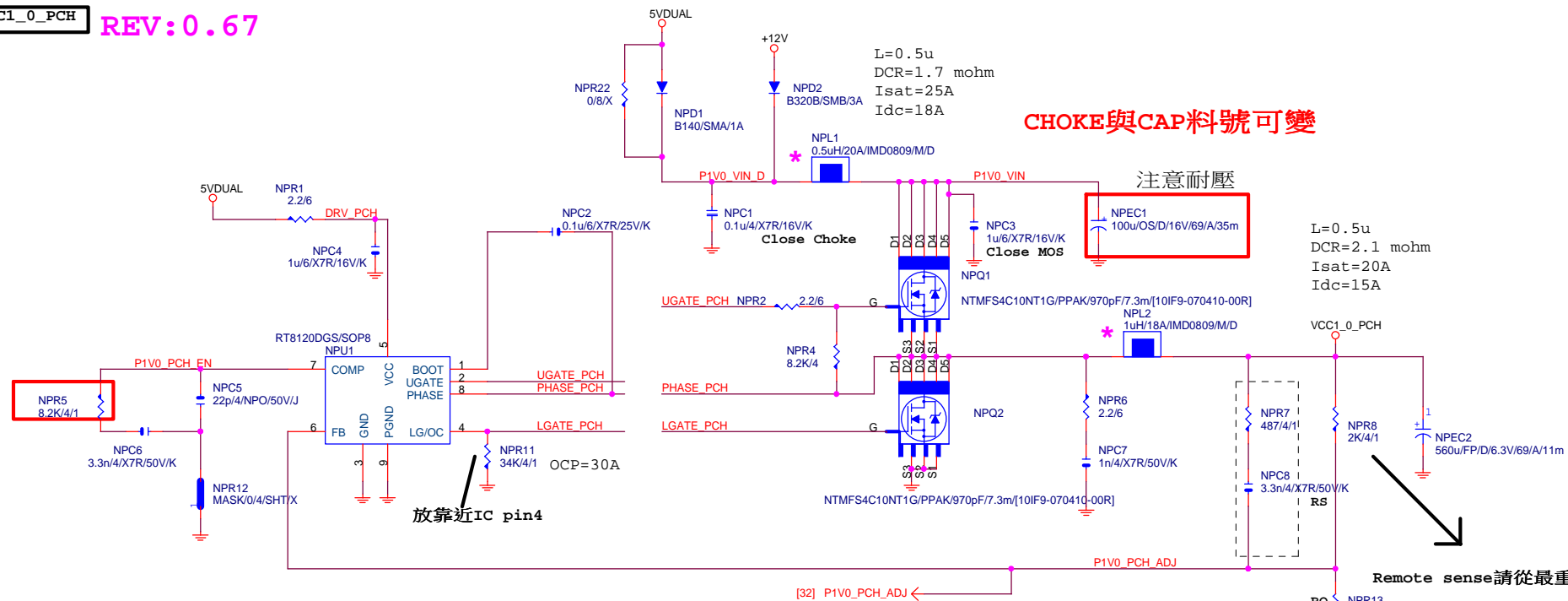
|        |                              |                |
|--------|------------------------------|----------------|
| Size   | Document Number              | Rev            |
| Custom | <b>GA-Q170M-MK</b>           | <b>1.0</b>     |
| Date:  | Wednesday, December 09, 2015 | Sheet 29 of 53 |



\* 删除 MA\_DR32







CHOKE與CAP料號可變

注意耐壓

放靠近IC pin4

Remote sense請從最重的負載端點拉回

$$\begin{aligned} 0.8 \cdot (1 + RS/RO) &= V_{out} \\ 0.8 \cdot [1 + 2K/8K] &= 1.0V \end{aligned}$$

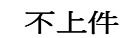
請放置CHOKE一出來的地方

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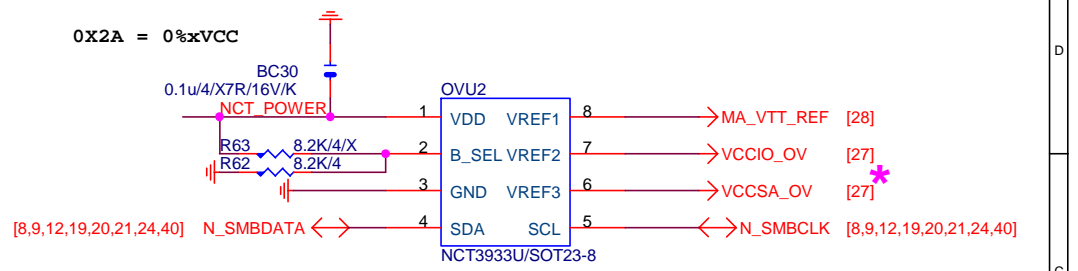
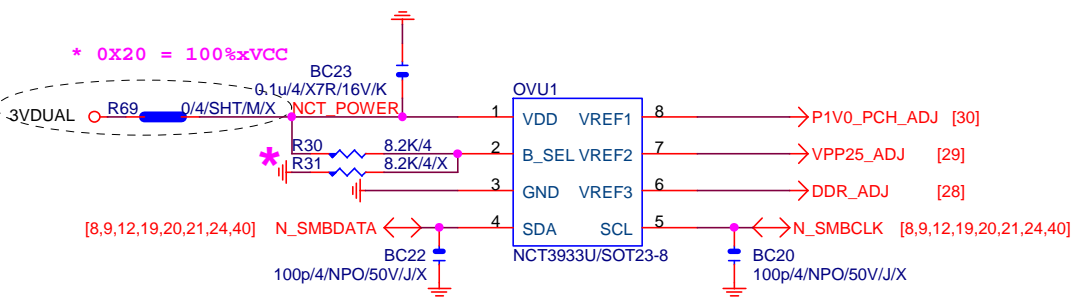
|                  |                              |                |
|------------------|------------------------------|----------------|
| Title            |                              |                |
| RT8120_PCH-CHOKE |                              |                |
| Size             | Document Number              | Rev            |
| Custom           | GA-Q170M-MK                  | 1.0            |
| Date:            | Wednesday, December 09, 2015 | Sheet 30 of 53 |

REV: 0.51

```
[16] 5VAUX_SW >>
```



OVER VOLTAGE



0X22 = 75%xVCC

\* 删除 OVU3

| NCT3933 | 0X20       | 0X2A   |
|---------|------------|--------|
| VREF1   | VCC1_0_PCH | DDRVTT |
| VREF2   | VPP_25V    | VCCIO  |
| VREF3   | VDDQ       | VCCSA  |

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**Gigabyte Technology**

Title

CPU CORE VR-2

Size Custom

Document Number

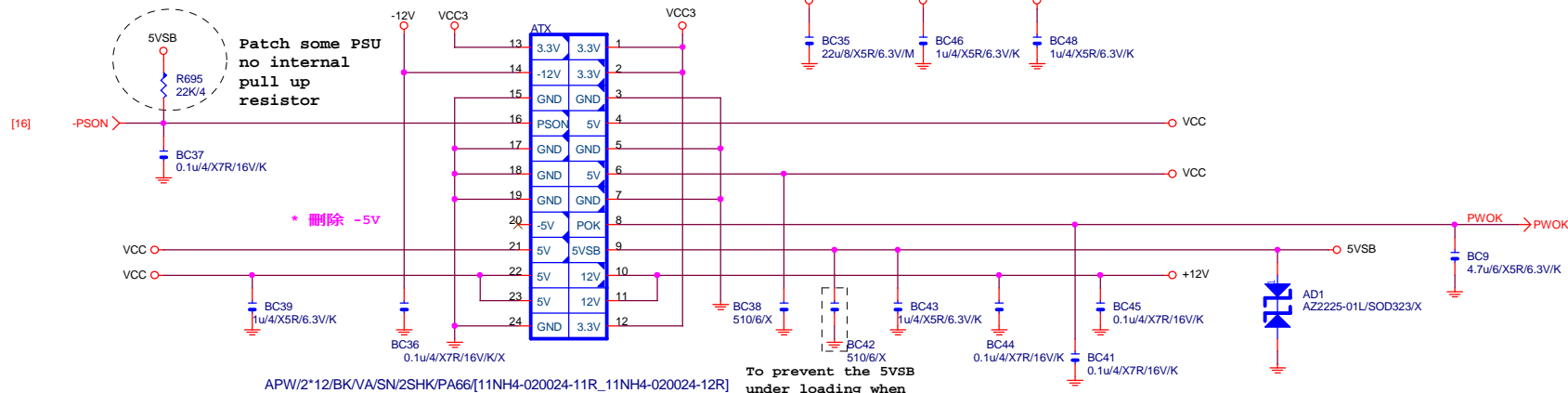
GA-Q170M-MK

Rev 1.0

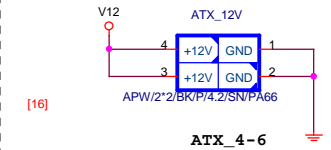
Date: Wednesday, December 09, 2015

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## ATXX24 POWER CONNECTOR

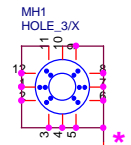


## ATX POWER CONNECTOR

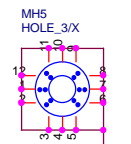


## 螺絲孔

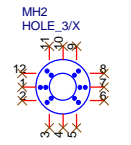
MH1:GND-T  
FOR EMI  
TEST驗證



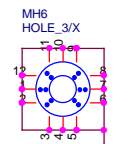
HOLE\_4-RH-1



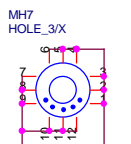
HOLE\_4-RH-1



HOLE\_4-RH-1

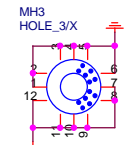


HOLE\_4-RH-1

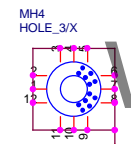


HOLE\_4-RH-5MM-1

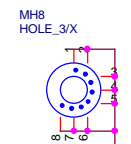
14/12/24  
Modify for EMI



HOLE\_4-RH-5MM-1



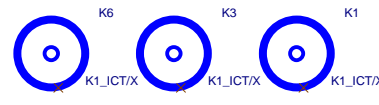
HOLE\_4-RH-5MM-1



HOLE\_4-RH-5MM-5PIN-1

\* Add MH8

## 固定孔/光學點



K1-ICT

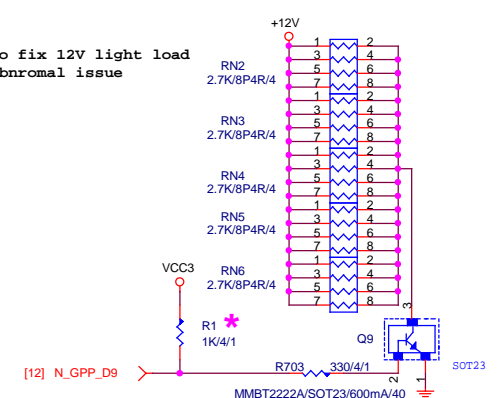
To prevent the 5VSB  
under loading when  
boot



4MMH

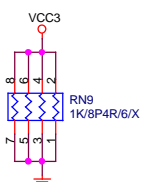
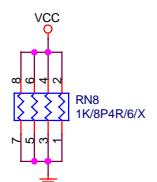
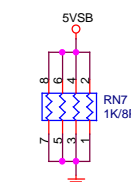
## +12V DUMMY LOAD

To fix 12V light load  
abnormal issue

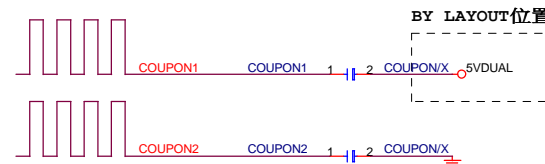


【技術通報R&D技術通報153】

## DUMMY LOAD



## COUPON



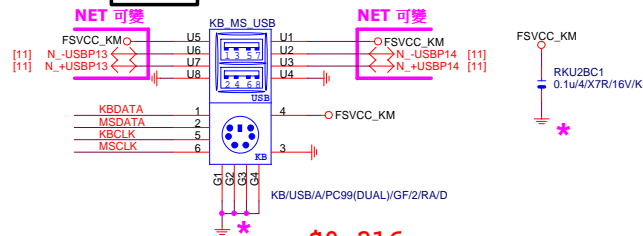
BY LAYOUT位置

Gigabyte Technology

|                     |                              |                |
|---------------------|------------------------------|----------------|
| Title               |                              |                |
| ATX POWER CONNECTOR |                              |                |
| Size                | Document Number              | Rev            |
| Custom              | GA-Q170M-MK                  | 1.0            |
| Date:               | Wednesday, December 09, 2015 | Sheet 33 of 53 |

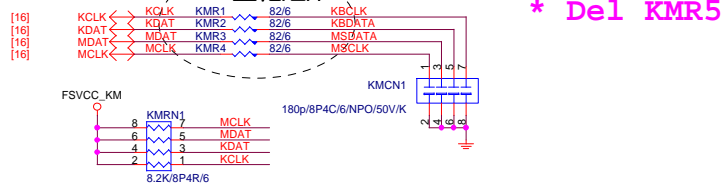
Rev: 0.72

KB/MS



**\$0.216**

## FOR鹽化短路

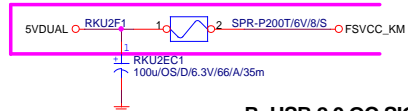


\* Del KMR5

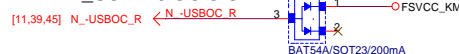


USB\_DAC

### NET 可變, 與其他USB SHARE



## R\_USB 2.0 OC SIGNAL



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## GIGABYTE

| Title |
|-------|
|-------|

KB\_MS

Size

|                 |
|-----------------|
| Document Number |
|-----------------|

GA-Q170M-MK

Rev

Date:

Wednesday, December 09, 2015

Sheet

---

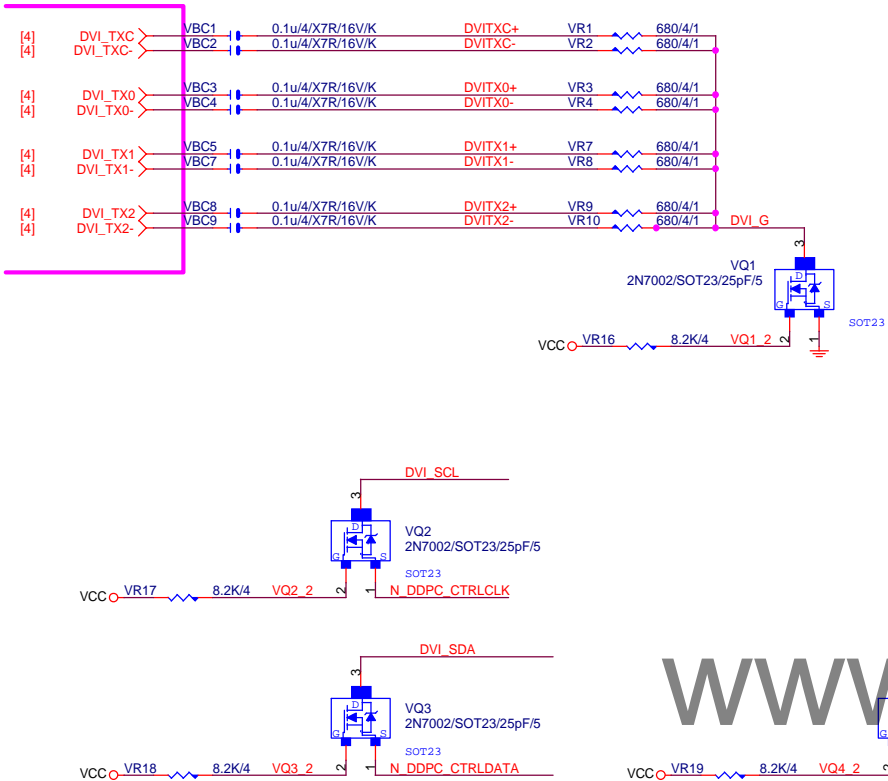
34

53

# DVI-D Rev: 0.72

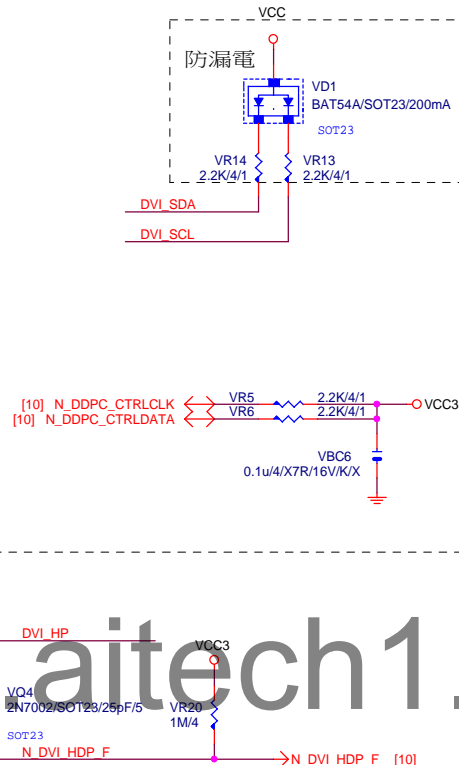
DVI: 20/4/6/4/20  
Impedance=85 +- 17.5%

NET 可變



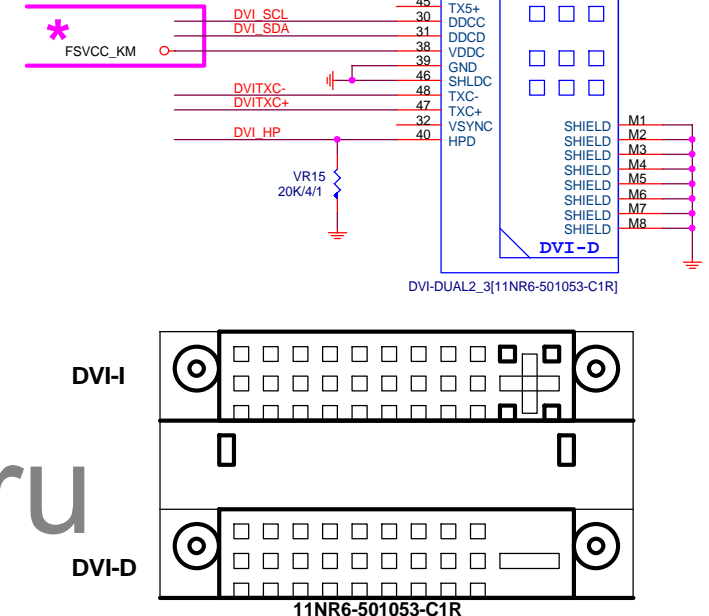
# DVI-D PU

R&D技術通報 162



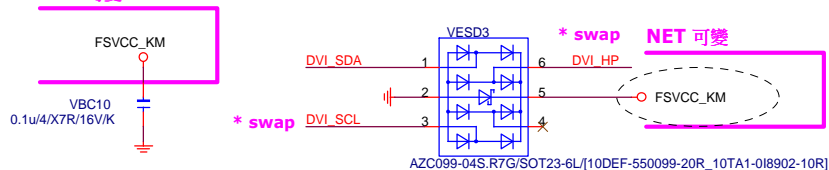
# DVI-D CONN

NET 可變

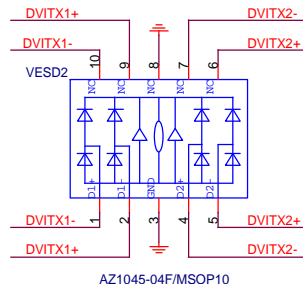


# DVI-D ESD

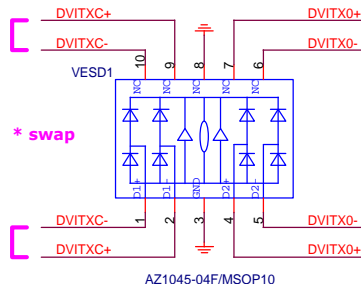
NET 可變



Close to connector



Close to connector



Close to connector

Gigabyte Technology

| Title  |                              |             |          |
|--------|------------------------------|-------------|----------|
| DVI    |                              |             |          |
| Size   | Document Number              | GA-Q170M-MK |          |
| Custom |                              | Rev 1.0     |          |
| Date:  | Wednesday, December 09, 2015 | Sheet       | 35 of 53 |

ROM PART: PTN3356R1BS/[10HQ5-A23356-10R]  
FLASH PART: PTN3356F1BS/[10HQ5-A23356-20R]

省X'TAL COST DOWN:

1. 上件:

DVC28 [10p/4/NPO/50V/J]

DVC11 [10p/4/NPO/50V/J]~修改值

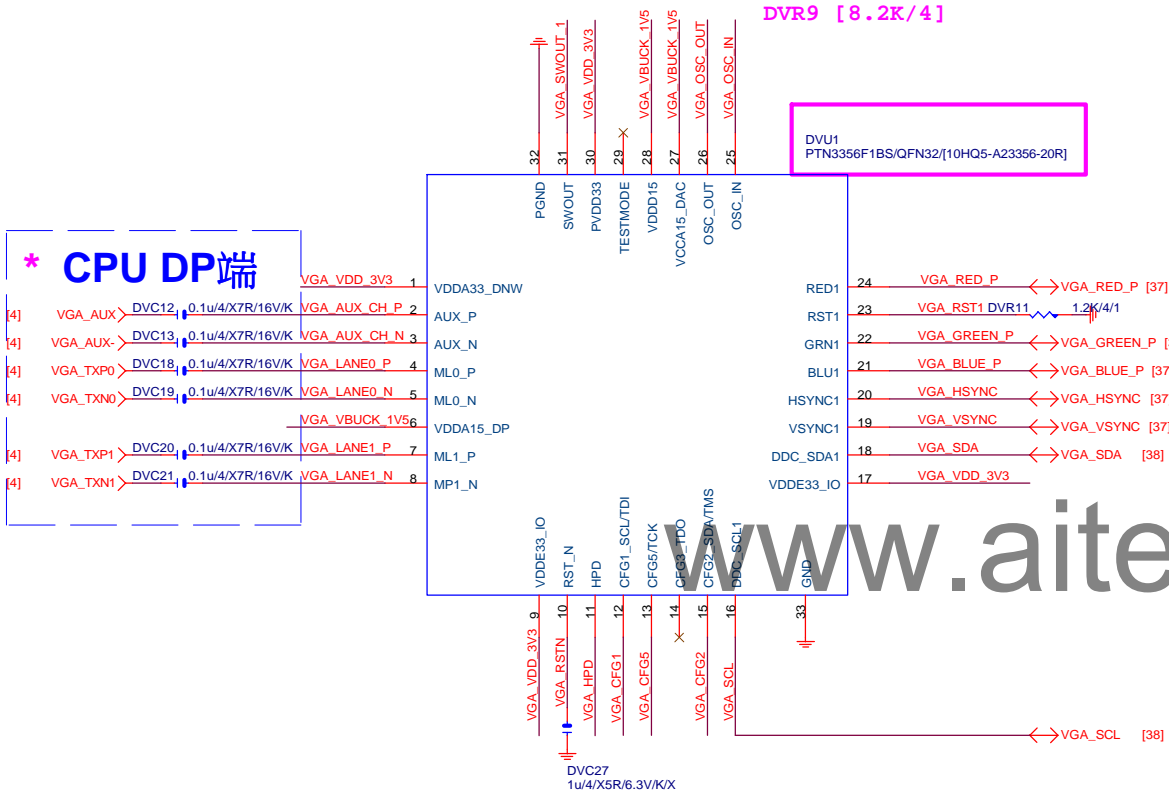
DVR10 [8.2K/4]

2. 刪除:

DVX1 [25M/16p/30ppm/49US/20/D]

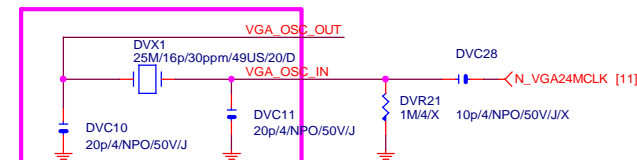
DVC10 [20p/4/NPO/50V/J]

DVR9 [8.2K/4]

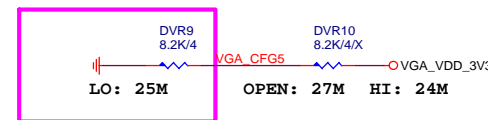


\*Del DVR19 ,DV20

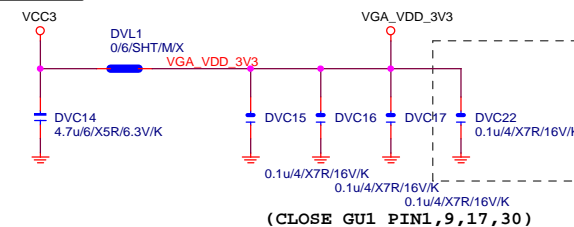
25M Crystal FROM PCH 24MHZ ISSUE



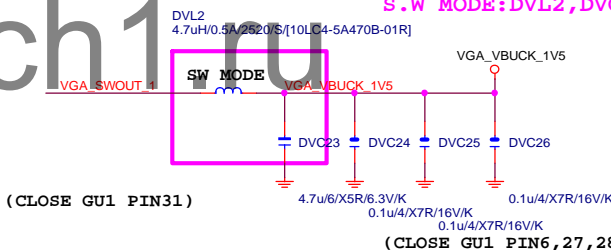
**CFG5** For Crystal Less



ADAPTER POWER

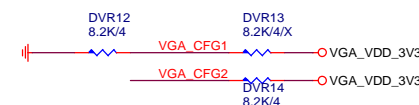


```
LDO  MODE:DVL2,DVC23-->X
S.W  MODE:DVL2,DVC23-->O
```

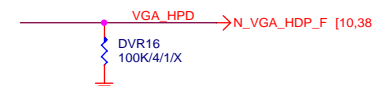


CFG1&amp;2

Non-Compliant



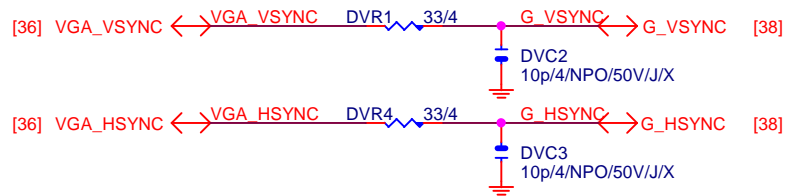
HPD PCH端





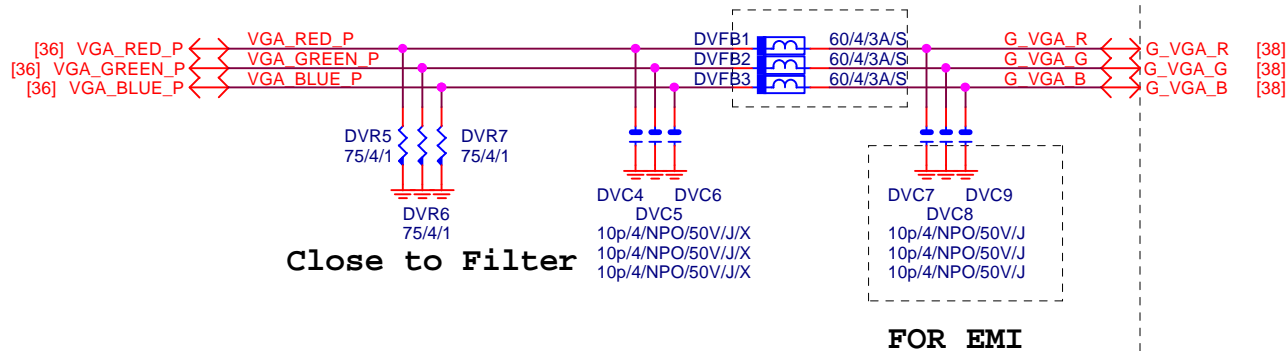
\*Del DVD1

\*Del VGA

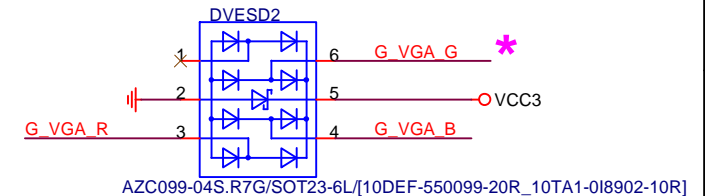


VGA ESD

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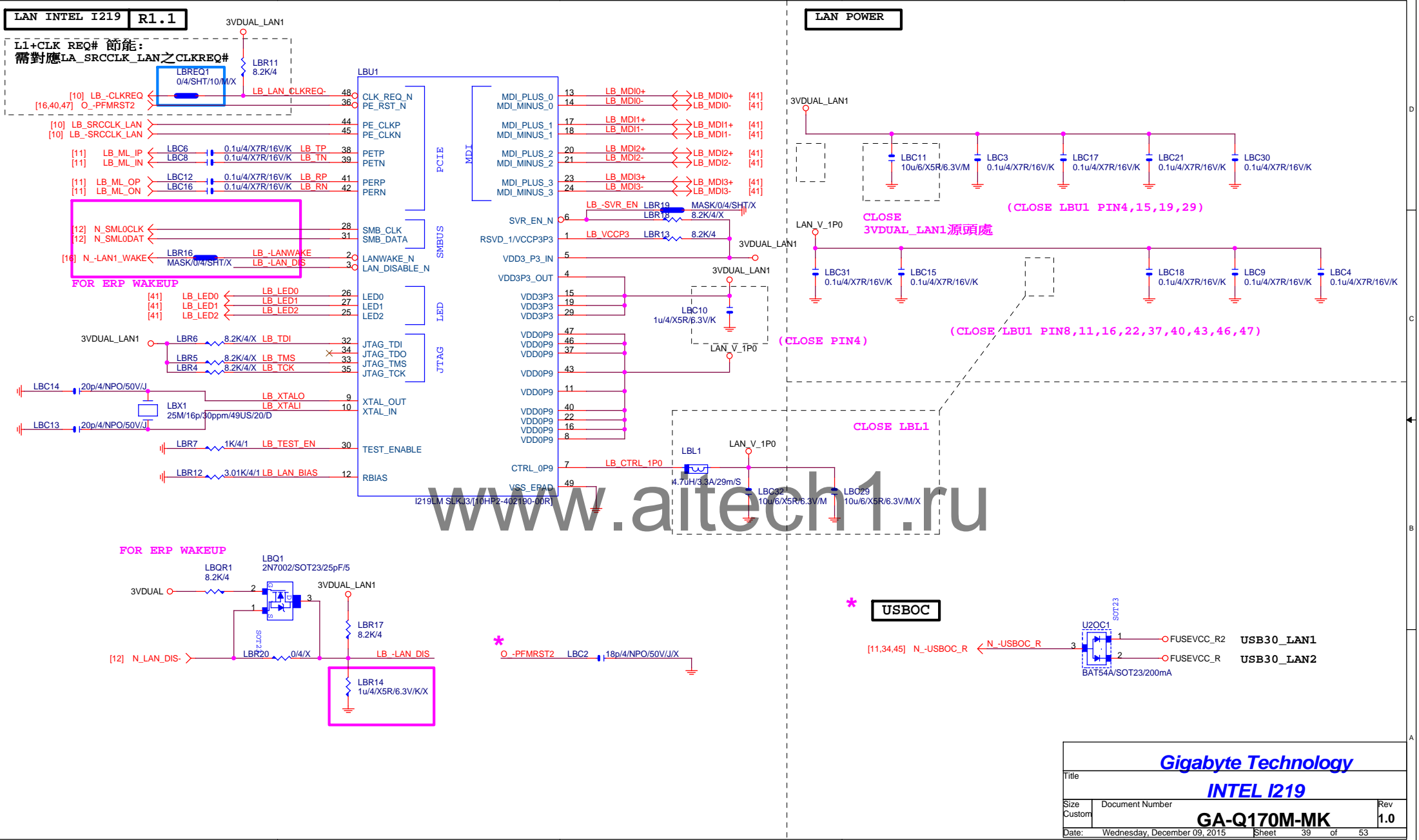
```
*Del DVESD1
```



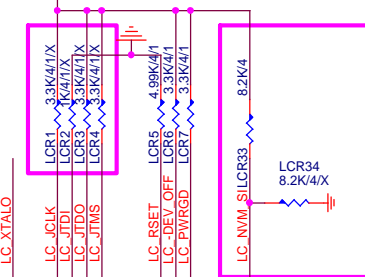
Gigabyte Technology  
**NXP-PTN3356**

|                |                                       |                |
|----------------|---------------------------------------|----------------|
| Size<br>Custom | Document Number<br><b>GA-Q170M-MK</b> | Rev<br>1.0     |
| Date:          | Wednesday, December 09, 2015          | Sheet 37 of 53 |



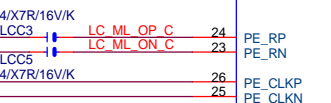


N/A



When pulled up, iNVM security features are enabled.

N/A



FOR ERP WAKEUP

## SUPPORT CIRCUITS

# POWER SUPPLY & I210 REGULATOR

PCIE\_NC-SI\_SMB

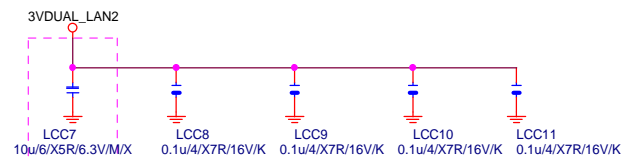
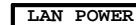
I211-AT MDI LED SDE



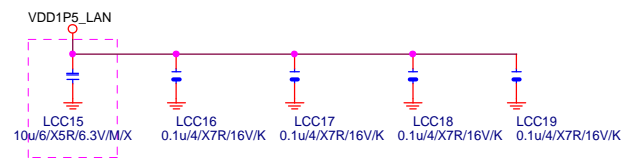
CLOSE  
3VDUAL\_LAN2源頭處

(CLOSE PIN38)

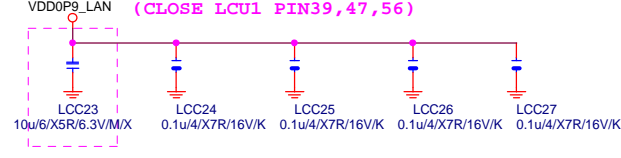
(CLOSE PIN39)



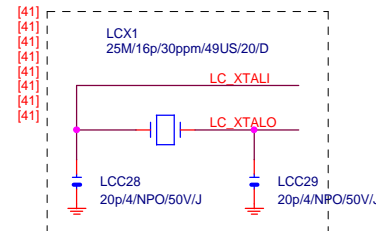
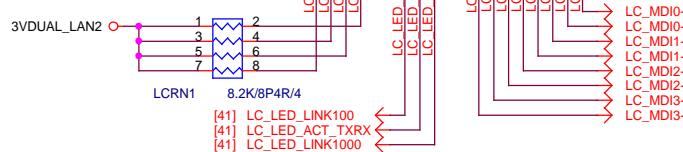
```
(CLOSE LCU1 PIN10,27,41,51,64)
```



(CLOSE LCU1 PIN39,47,56)



(CLOSE LCU1 PIN11,32,38,42,59)



## Gigabyte Technology

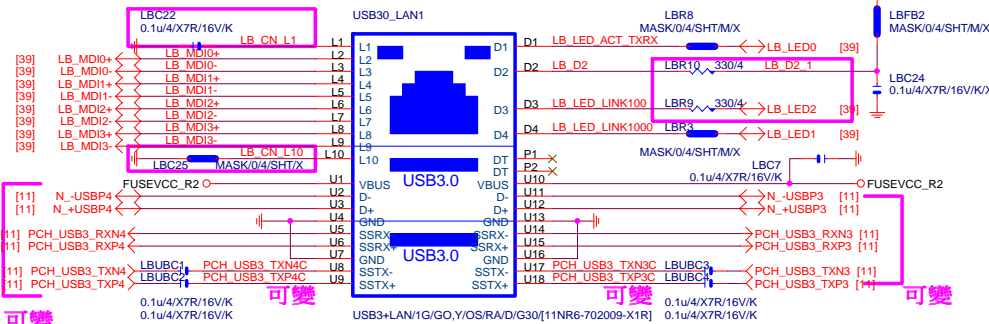
**INTEL I211AT**

|                                    |                                       |            |
|------------------------------------|---------------------------------------|------------|
| Size<br>Custom                     | Document Number<br><b>GA-Q170M-MK</b> | Rev<br>1.0 |
| Date: Wednesday, December 09, 2015 | Sheet 40 of 53                        |            |

# USB LAN CONNECTOR-B R1.1

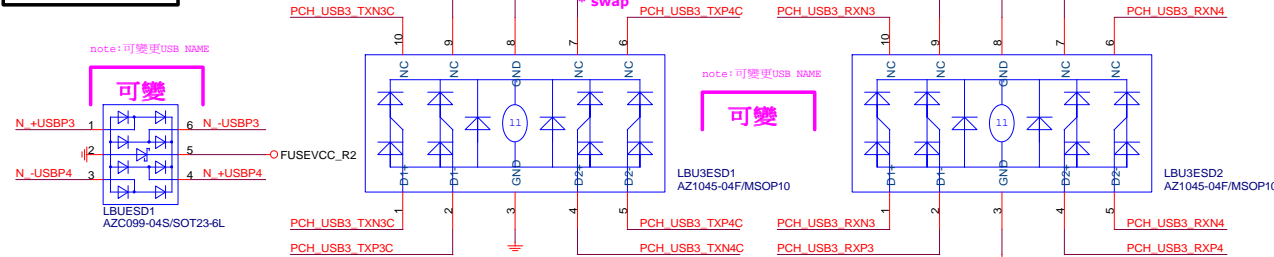
note:可變更USB NAME

[I219]



LA\_MDI-->100歐姆:[20/4/8/4/20]

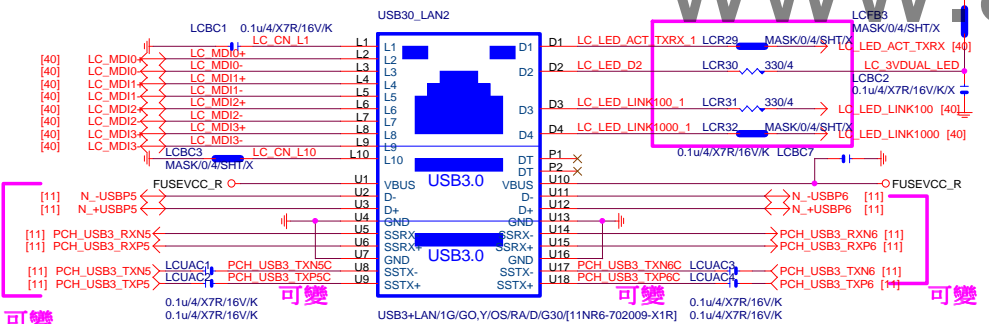
## RMA ESD PROTECT



## USB LAN CONNECTOR-C

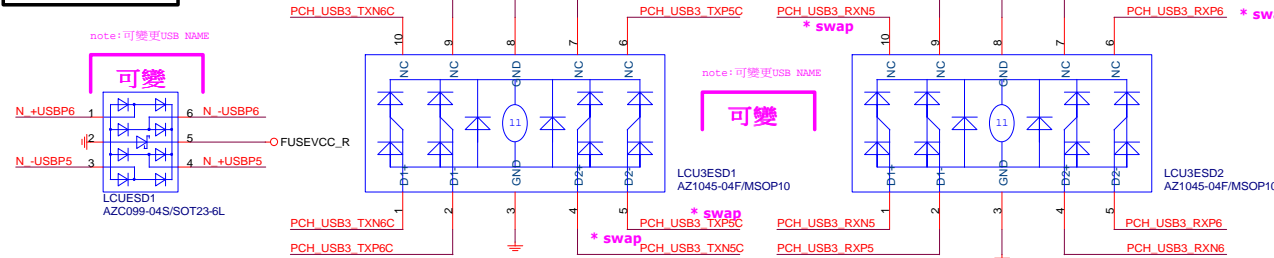
note:可變更USB NAME

[I211]



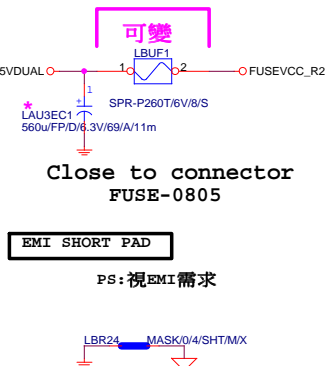
LA\_MDI-->100歐姆:[20/4/8/4/20]

## RMA ESD PROTECT

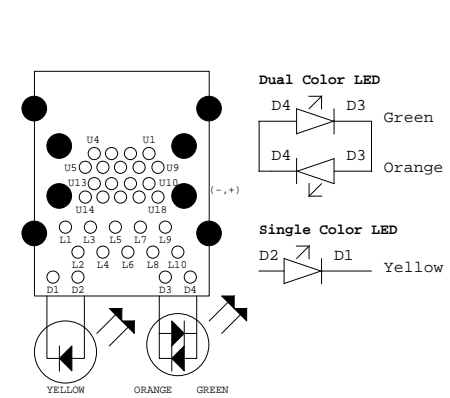


## USB POWER

note:可變更FUSE



## USB30 LAN LAYOUT示意图



## LAN COVER

可變  
[視SPEC需求]

\*Del LAN COVER

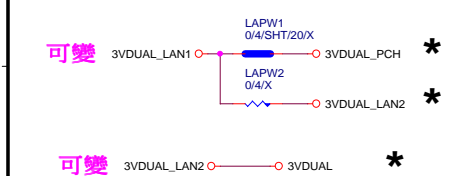
FOOT PRINT:LAN COVER

## 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

note: lan power連接及電流  
For PWT :LAPW1, LAPW2, R0402-2-SH08T20



~USB30\_LAN1設定在ERP可LAN WAKEUP

~USB30\_LAN2由獨立LAN POWER L1117供給

Gigabyte Technology

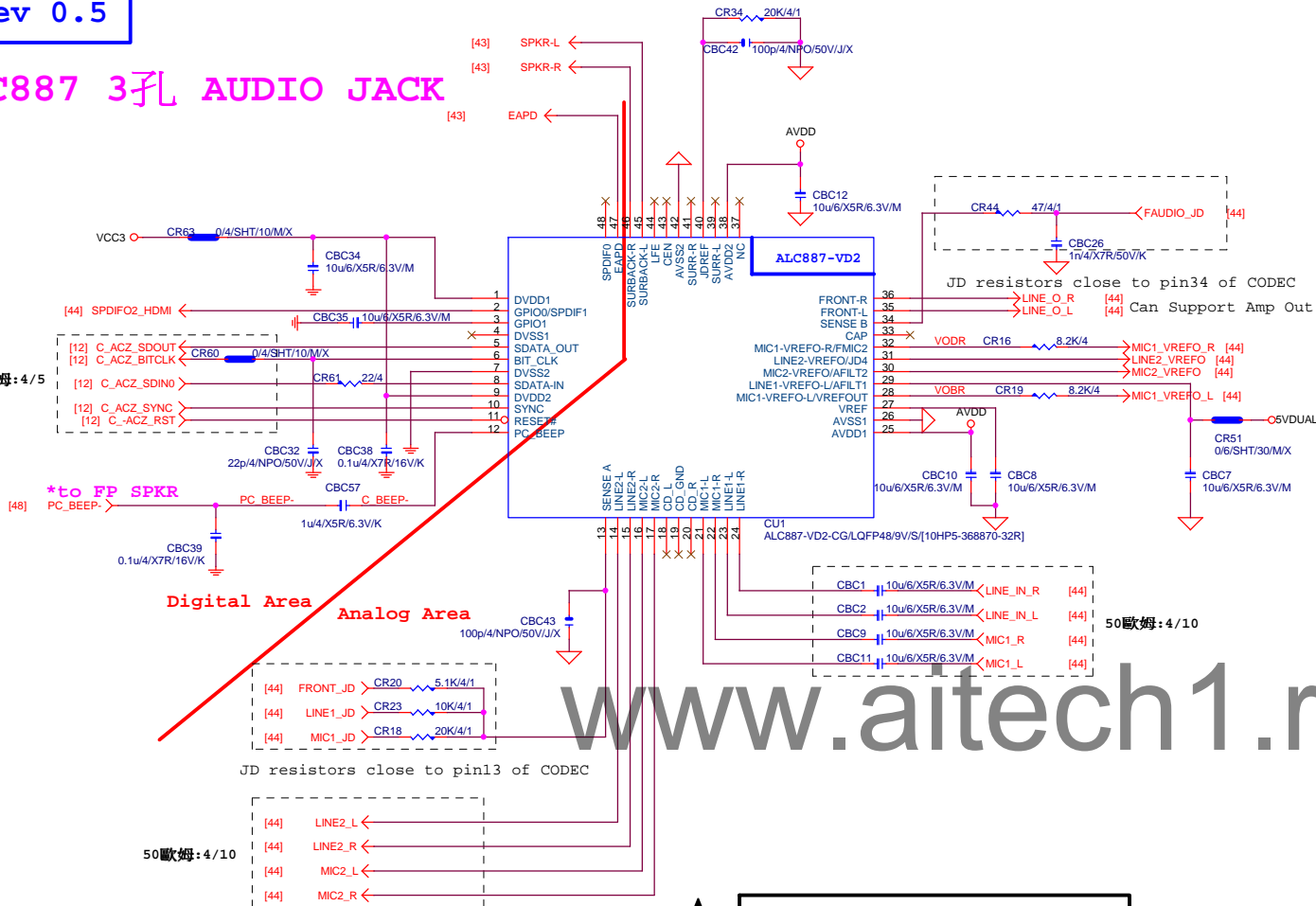
INTEL I219

|             |                              |                |
|-------------|------------------------------|----------------|
| Size Custom | Document Number              | Rev            |
|             | GA-Q170M-MK                  | 1.0            |
| Date:       | Wednesday, December 09, 2015 | Sheet 41 of 53 |

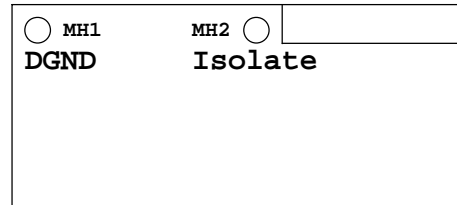
Rev 0.5

# ALC887 3孔 AUDIO JACK

50歐姆:4/5

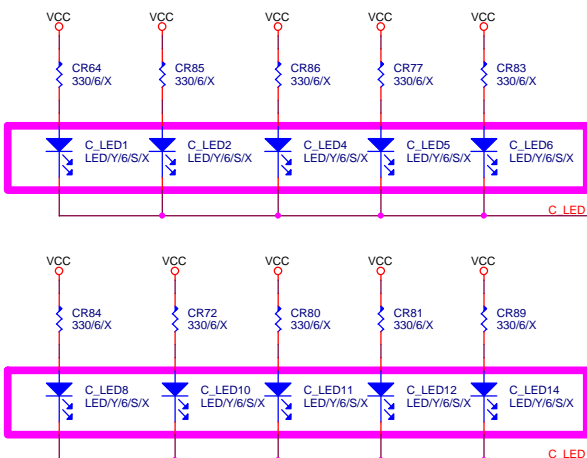


LAYOUT注意:螺絲孔下GND方式  
1. MH1空間夠,下DGND  
空間不夠,改為Isolate  
2. MH2一律改為Isolate

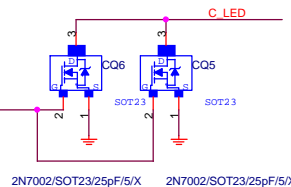


★ PVT 時 LED circuit 背板mask

VALUE可變,LED顏色請自行修改  
(預設:低亮度黃色LED:LED/Y/6/S)



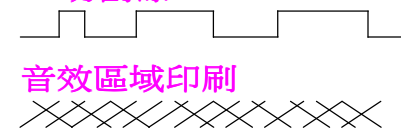
★ (IT8620 GP37)



\*料號後補

BOM OPTION : 1. Chemicon音效電容  
2. 金屬外罩 Reserve (上件與否,依照各Model spec)  
3. LED Reserve (上件與否和LED顏色,依照各Model spec)

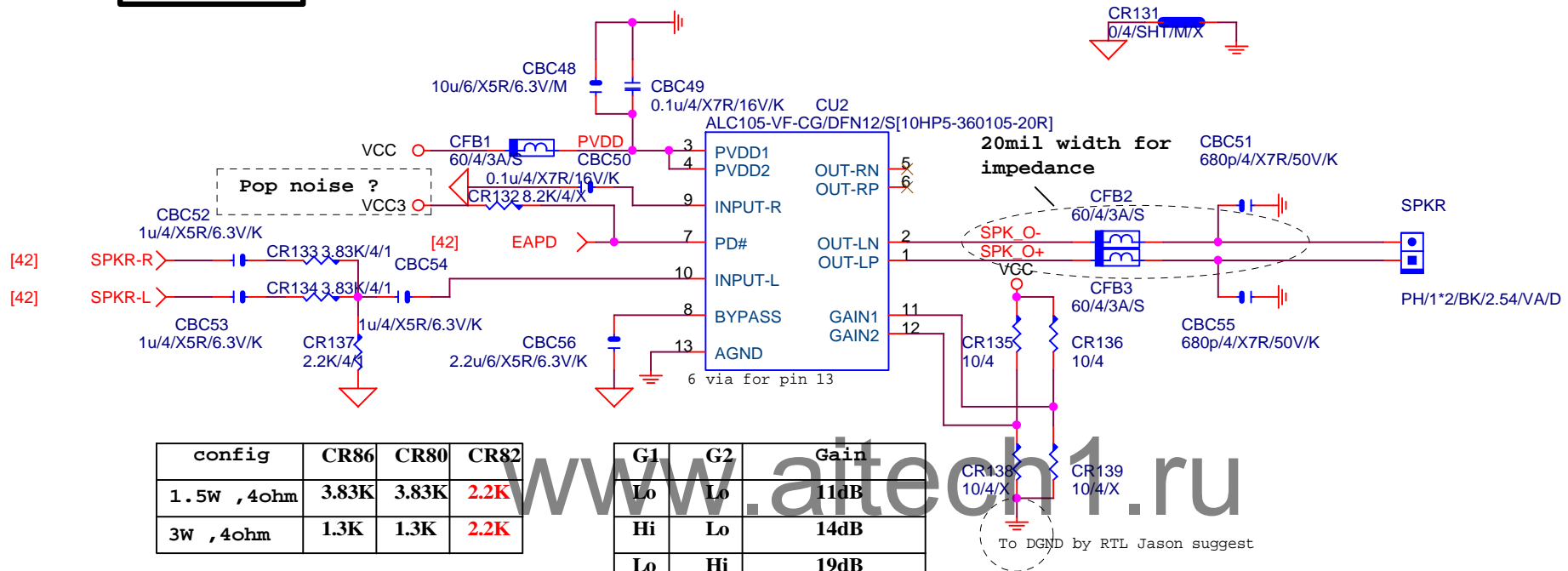
LAYOUT注意:要加  
GND切割線



音效區域印刷

|                       |                              |                |         |
|-----------------------|------------------------------|----------------|---------|
| Gigabyte Technology   |                              |                |         |
| Title HD AUDIO ALC887 |                              |                |         |
| Size Custom           | Document Number              | GA-Q170M-MK    | Rev 1.0 |
| Date:                 | Wednesday, December 09, 2015 | Sheet 42 of 53 |         |

# MONO SPKR



| config     | CR86  | CR80  | CR82 |
|------------|-------|-------|------|
| 1.5W ,4ohm | 3.83K | 3.83K | 2.2K |
| 3W ,4ohm   | 1.3K  | 1.3K  | 2.2K |

\* all 1% parts

\*NOW

| G1 | G2 | Gain |
|----|----|------|
| Lo | Lo | 11dB |
| Hi | Lo | 14dB |
| Lo | Hi | 19dB |
| Hi | Hi | 25dB |

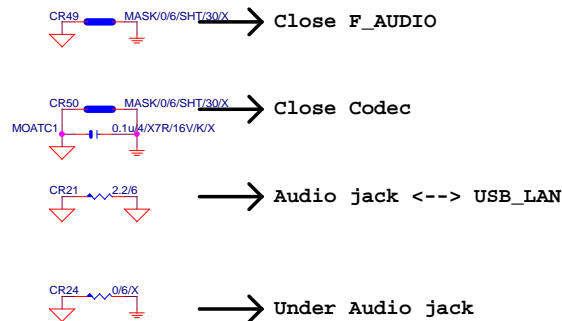
Pin1,2,3,4,5,6,7,13 ref GND  
pin8,9,10,11,12 ref AGND

Gigabyte Technology

|           |                              |                |
|-----------|------------------------------|----------------|
| Title     |                              |                |
| MONO SPKR |                              |                |
| Size A    | Document Number              | Rev            |
|           | GA-Q170M-MK                  | 1.0            |
| Date:     | Wednesday, December 09, 2015 | Sheet 43 of 53 |

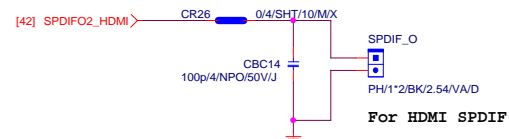


Rev 0.5



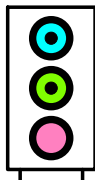
★ 量産前, 0ohm改short pad

## SPDIF\_OUT



## SPDIF\_IN

## AZALIA JACK

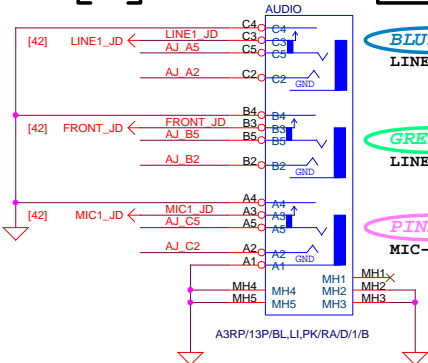


## AZALIA JACK

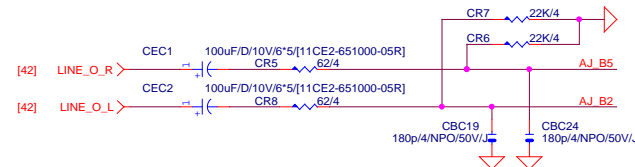
BLUE  
LINE-IN

GREEN  
LINE-OUT

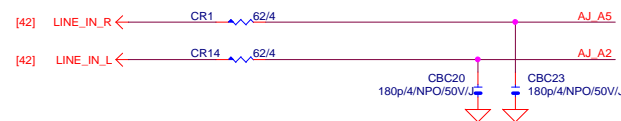
PINK  
MIC-IN



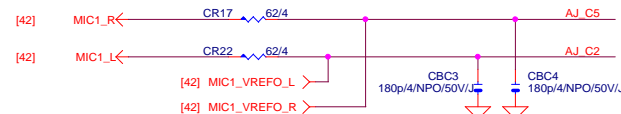
## LINE-OUT



## LINE-IN



## MIC-IN

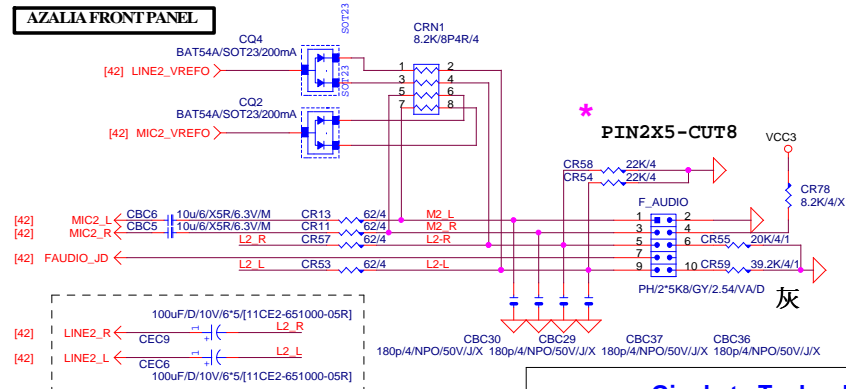


## SURROUND

## CEN/LFE

## SURRBACK

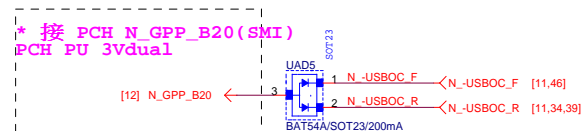
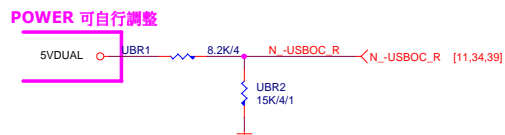
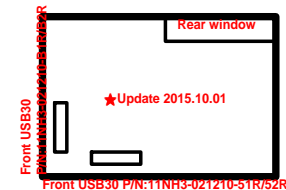
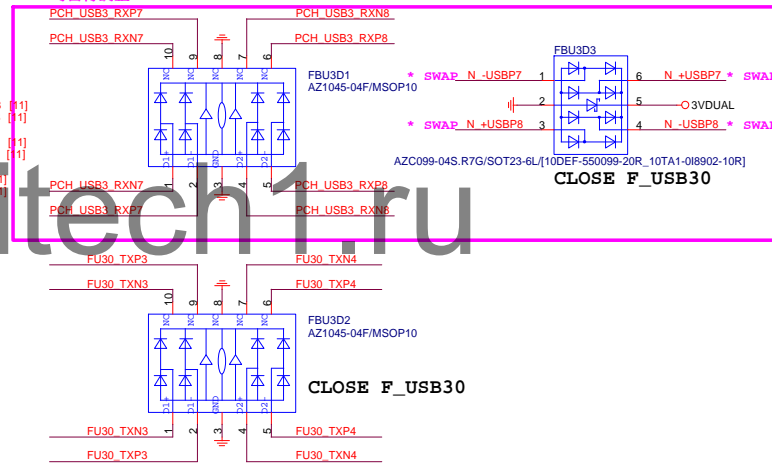
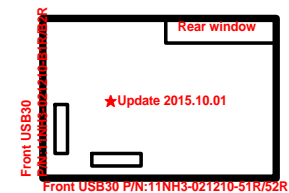
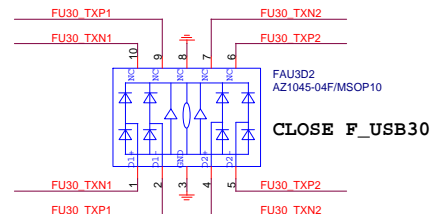
## AZALIA FRONT PANEL



Gigabyte Technology

AUDIO JACK

|       |                              |                |
|-------|------------------------------|----------------|
| Title | Document Number              | Rev            |
|       | GA-Q170M-MK                  | 1.0            |
| Size  | Custom                       |                |
| Date: | Wednesday, December 09, 2015 | Sheet 44 of 53 |

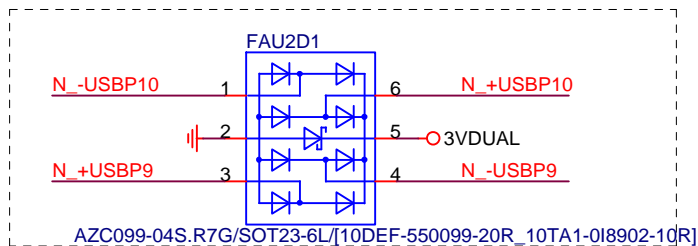
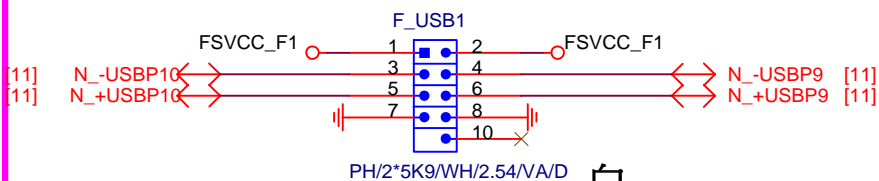


Rev: 0.72

## FRONT USB1

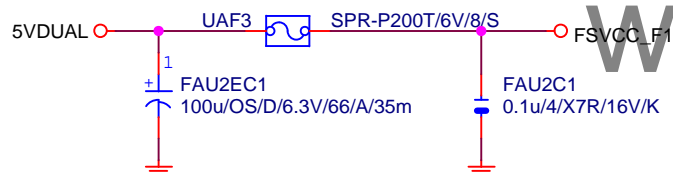
NET 可變

## FUSB2X5-S

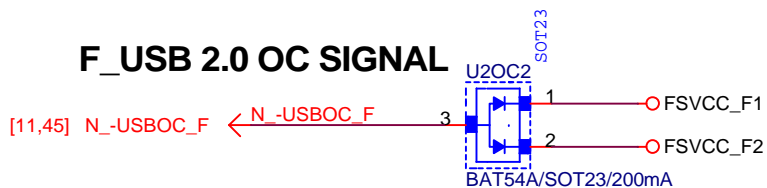


Close to connector

FUSE 2 Port 1 Fuse 2A



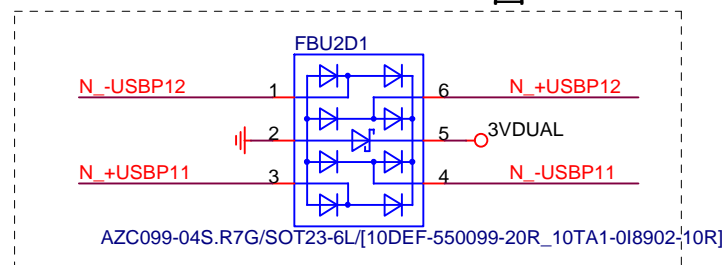
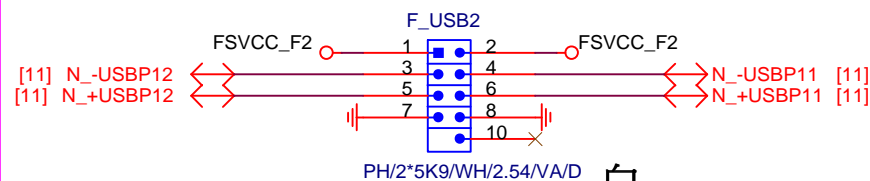
## F\_USB 2.0 OC SIGNAL



## FRONT USB2

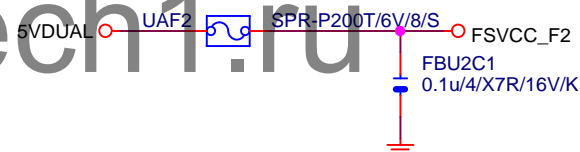
NET 可變

## FUSB2X5-S



Close to connector

FUSE 2 Port 1 Fuse 2A



\* 放置N\_DB\_CLK與T\_TPMCLK中間(EMI)

Gigabyte Technology

Title

F\_USB

Size  
A

Document Number

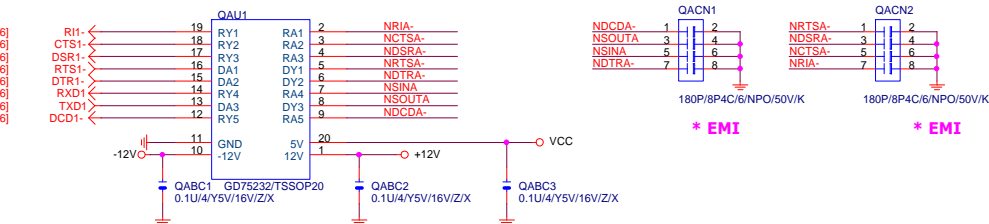
GA-Q170M-MK

Rev  
1.0

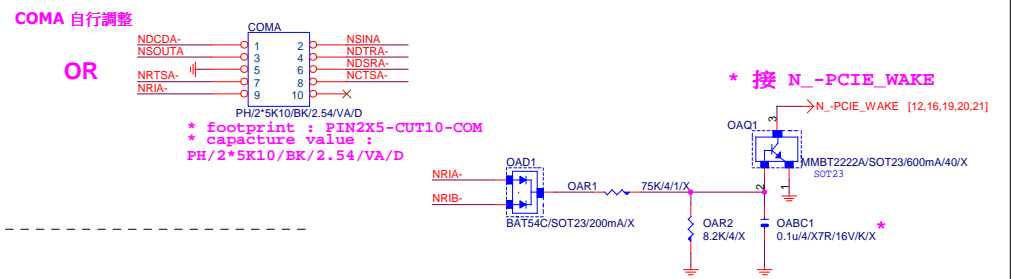
Date: Wednesday, December 09, 2015

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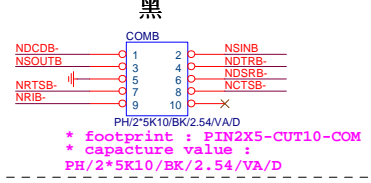
COM PORT



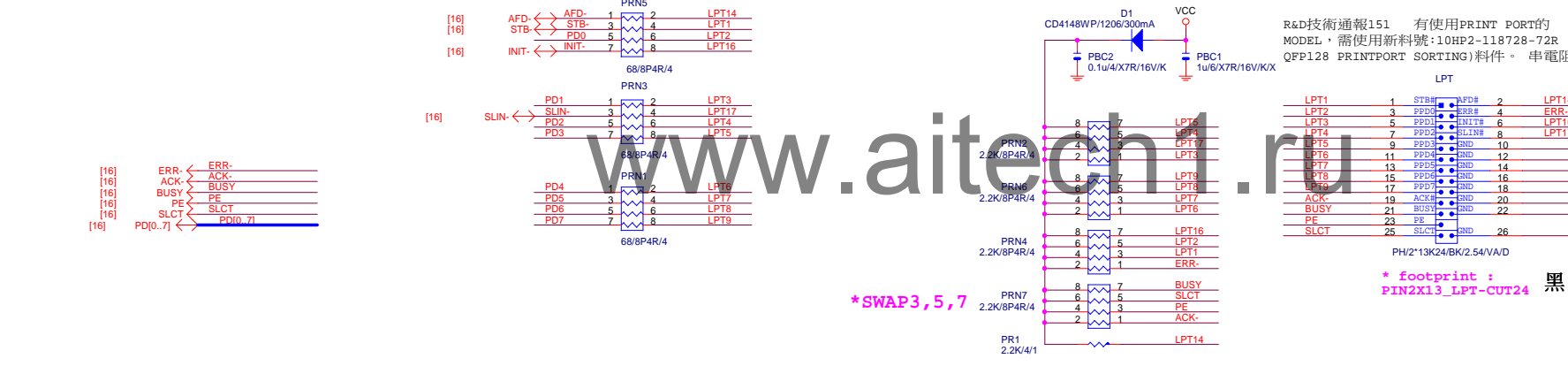
COMA



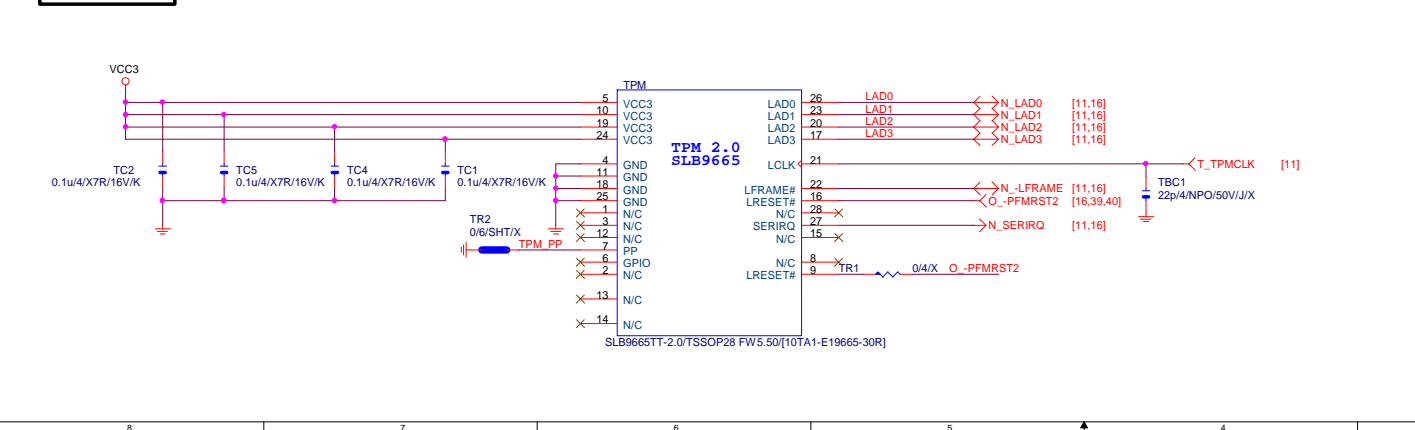
COMB



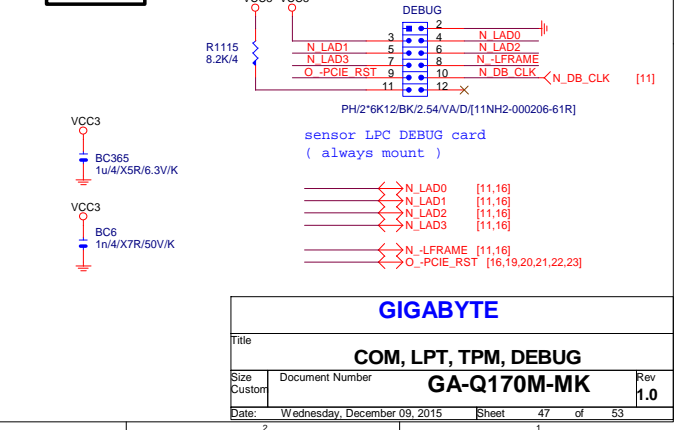
LPT PORT



TPM onboard

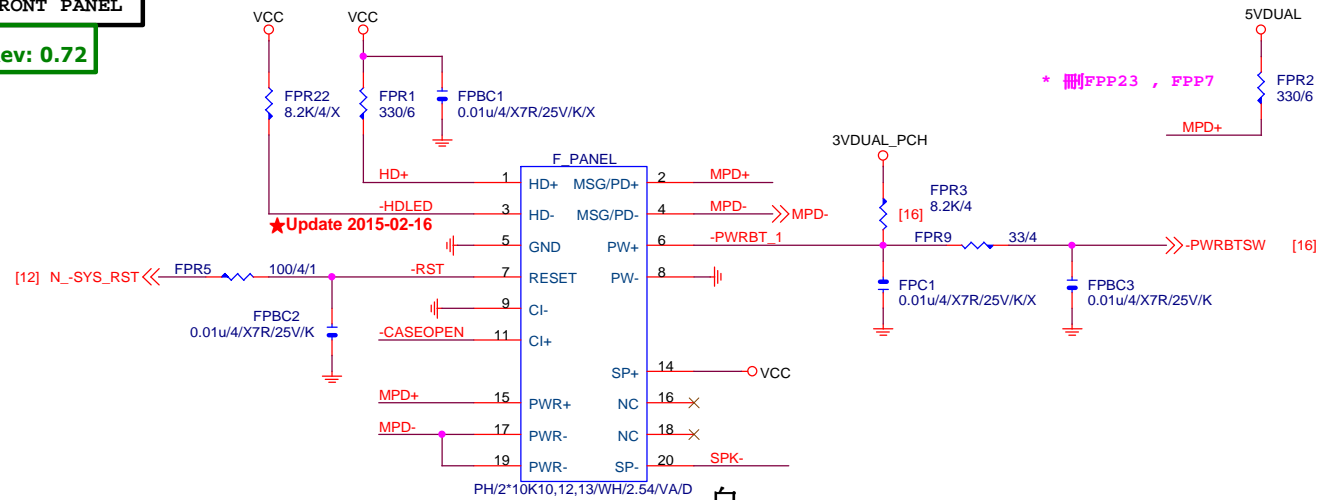


80 PORT

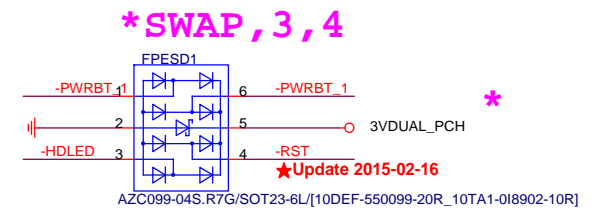


## FRONT PANEL

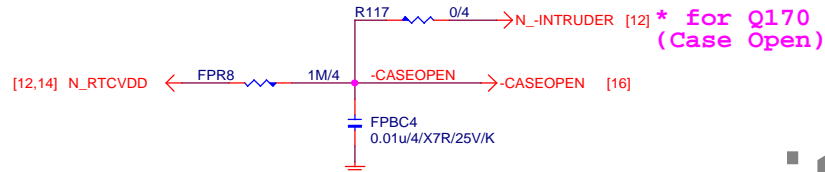
Rev: 0.72



## ESD

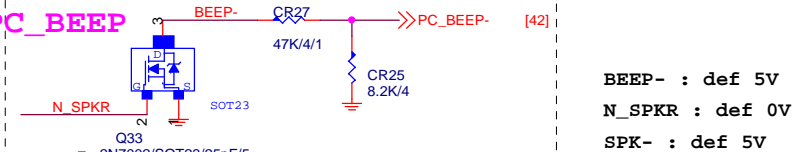


## CASE OPEN

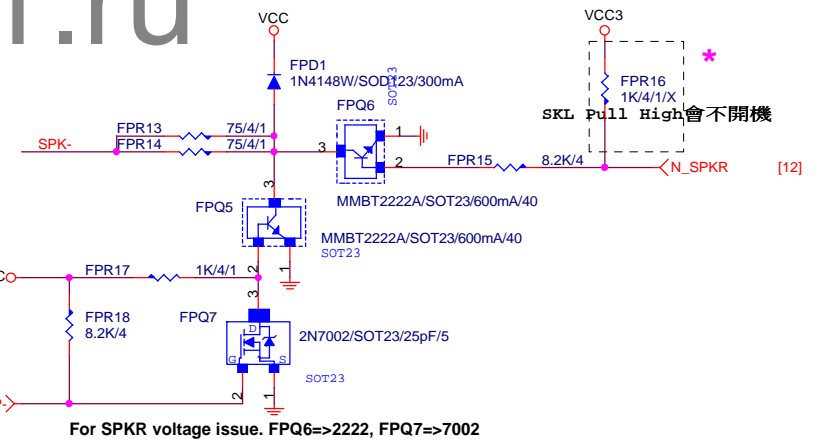
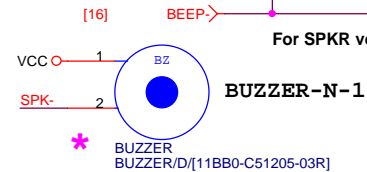
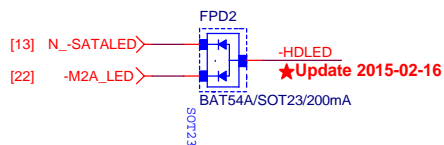


## SPKR

## \* PC\_BEEP



## SATA LED

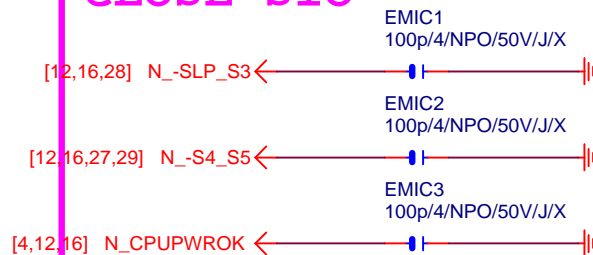


Gigabyte Technology

| Title       |                              |                |
|-------------|------------------------------|----------------|
| FP,SPK,BZ   |                              |                |
| Size Custom | Document Number              | Rev 1.0        |
| Date:       | Wednesday, December 09, 2015 | Sheet 48 of 53 |

GA-Q170M-MK

## CLOSE SIO



## CLOSE PCH



www.aitech1.ru

**GIGABYTE™**

Title

**EMI/ESD**

Size  
A

Document Number

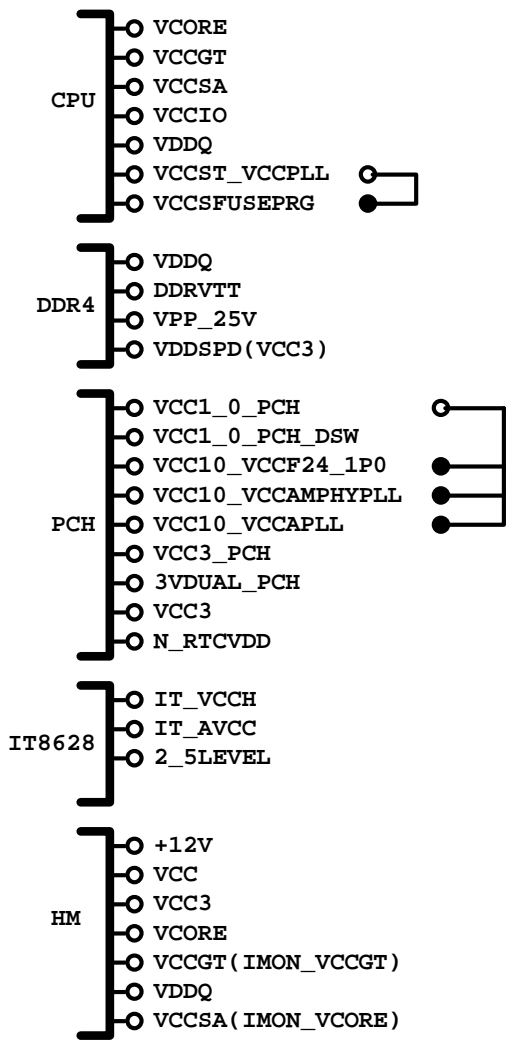
**GA-Q170M-MK**

Rev  
**1.0**

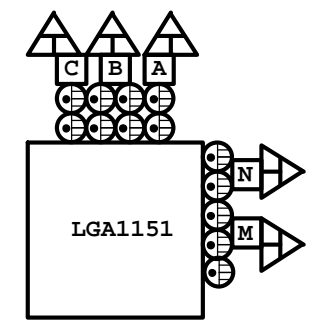
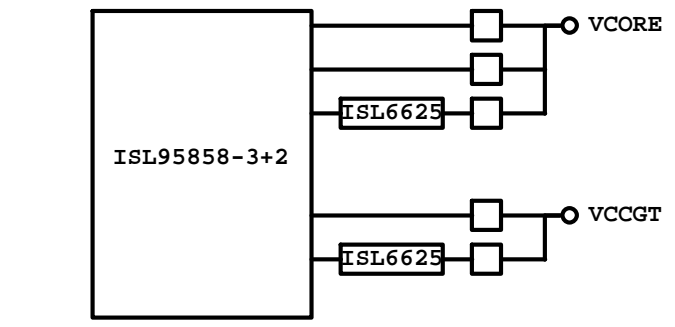
Date: Wednesday, December 09, 2015

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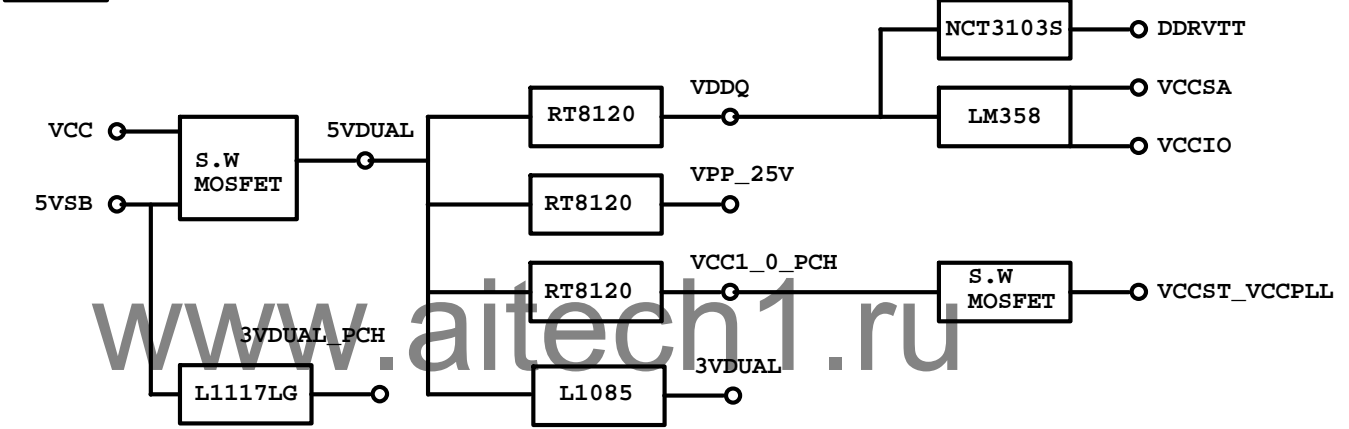
POWER BLOCK MAP



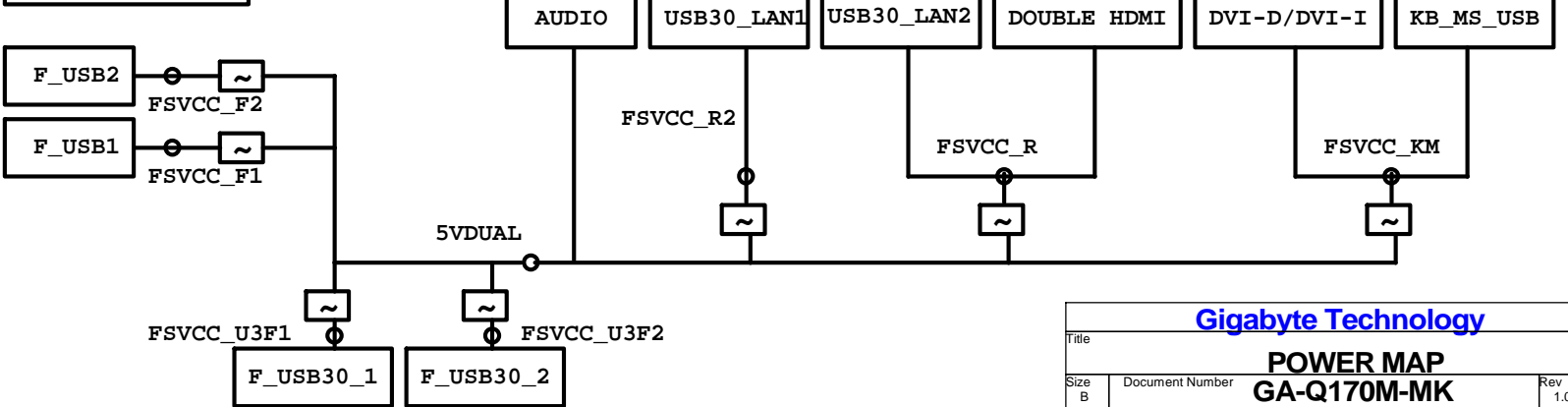
VCORE/VCCGT



POWER



FUSE POWER F/R



Gigabyte Technology

|           |                              |       |          |
|-----------|------------------------------|-------|----------|
| Title     |                              |       |          |
| POWER MAP |                              |       |          |
| Size      | Document Number              | Rev   |          |
| B         | GA-Q170M-MK                  | 1.0   |          |
| Date:     | Wednesday, December 09, 2015 | Sheet | 50 of 53 |



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 |

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 |
| PWM | RT8237C/D | 10TA1-608237-01R |               | IC10DFN-NIS5132   |

REGULATOR

|  |          | 料號               | Capture Value    | Footprint  |
|--|----------|------------------|------------------|------------|
|  | NCT3103S | 10GL2-203103-01R | NCT3103S/SOP8/2A | IC8-EPSOIC |

IRON CHOKE

|     | 料號               | Capture Value           | SIZE  | Footprint          |      |
|-----|------------------|-------------------------|-------|--------------------|------|
| DIP | 11LC5-M4500C-01R | 0.5uH/40A/IMD109/M/D    | 10*10 | CH0KE05U-40A-1PQ-3 | 閃電P  |
| DIP | 11LC5-M4500C-11R | 0.5uH/40A/IMD109/M/NP/D | 10*10 | CH0KE05U-40A-1PQ-3 | 無閃電P |
| DIP | 11LC5-M2500C-01R | 0.5uH/20A/IMD0809/M/D   | 8*8   | CH0KE1U-R50M-IF    |      |

Skylake Iron Choke閃電P導入機種如下:  
[1] Z170/H170 機種全部導入  
[2] B150/H110Gaming機種導入, 其餘不導入

Ferrite

|     | 料號               | Capture Value           | SIZE  | Footprint          |
|-----|------------------|-------------------------|-------|--------------------|
| DIP | 11LC5-F3500C-11R | 0.5uH/32A/INCG109/FSI/D | 10*10 | CH0KE05U-40A-1PQ-3 |
| DIP | 11LC5-F2500C-11R | 0.5uH/25A/INC0809/F/D   | 8*8   | CH0KE1U-R50M-IF    |
| SMD | 10LC5-F4300C-01R | 0.3uH/40A/SIUC/FR/S     | 10*7  | CH0KE11X8MM-SMD    |

BEAD

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

Rev 0.3

GIGABYTE™

|                  |                              |                |         |
|------------------|------------------------------|----------------|---------|
| Title POWER零件使用表 |                              |                |         |
| Size Custom      | Document Number GA-Q170M-MK  |                | Rev 1.0 |
| Date:            | Wednesday, December 09, 2015 | Sheet 51 of 53 |         |

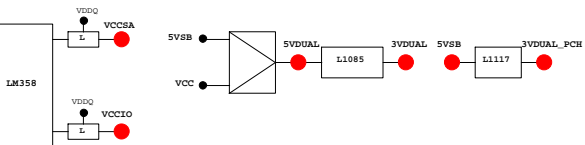
PCB GPIO LIST TABLE

| PIN NAME | PWR  | Default   | USAGE                  | NOTE                 |
|----------|------|-----------|------------------------|----------------------|
| GPP_A0   | MAIN | NATIVE    | N_-KBRST               | P/U 8.2K 3VDUAL      |
| GPP_A1   | MAIN | NATIVE    | N_LAD0                 | N/A                  |
| GPP_A2   | MAIN | NATIVE    | N_LAD1                 | N/A                  |
| GPP_A3   | MAIN | NATIVE    | N_LAD2                 | N/A                  |
| GPP_A4   | MAIN | NATIVE    | N_LAD3                 | N/A                  |
| GPP_A5   | MAIN | NATIVE    | N_-LFRAME              | N/A                  |
| GPP_A6   | MAIN | NATIVE    | N_SBR1RQ               | P/U 8.2K VCC3        |
| GPP_A7   | MAIN | NATIVE    | N_-LDRQ0               | P/U 8.2K 3VDUAL      |
| GPP_A8   | MAIN | NATIVE    | N_GPP_A8               | P/U 8.2K VCC3        |
| GPP_A9   | MAIN | NATIVE    | N_FPMCLK / N_LPC24M    | N/A                  |
| GPP_A10  | MAIN | NATIVE    | N_VGA24MCLK / N_DB_CLK | N/A                  |
| GPP_A11  | MAIN | NATIVE    | N_-P_FMR               | P/U 8.2K 3VDUAL_PCH  |
| GPP_A12  | MAIN | GPI       | N_GPP_A12              | P/U 8.2K VCC3        |
| GPP_A13  | MAIN | NATIVE    | N_-S_WARN              | N/A                  |
| GPP_A14  | MAIN | NATIVE    | N_GPP_A14              | P/U 8.2K 3VDUAL      |
| GPP_A15  | MAIN | NATIVE    | N_-S_ACK               | N/A                  |
| GPP_B0   | MAIN | CORE_V1D0 | N_-DDR_V_SEL           | P/U 8.2K VCC3        |
| GPP_B1   | MAIN | CORE_V1D1 | N/A                    | N/A                  |
| GPP_B2   | MAIN | GPI       | N_-VRALEST             | P/U 8.2K 3VDUAL      |
| GPP_B5   | MAIN | GPI       | -PCIE16_PR             | P/U 8.2K VCC3        |
| GPP_B6   | MAIN | GPI       | -PCIE16_PR1            | P/U 8.2K VCC3        |
| GPP_B7   | MAIN | GPI       | -PCIE16_PR2            | P/U 8.2K VCC3        |
| GPP_B8   | MAIN | GPI       | -PCIE16_PR             | P/U 8.2K VCC3        |
| GPP_B9   | MAIN | GPI       | N_GPP_B9               | P/D GND              |
| GPP_B10  | MAIN | GPI       | NA_-CLKREQ             | P/U 8.2K 3VDUAL_LAN1 |
| GPP_B11  | MAIN | GPO       | N/A                    | N/A                  |
| GPP_B12  | MAIN | SLP_S0    | N_SLP_S0               | N/A                  |
| GPP_B13  | MAIN | PLTRST    | N_-PFMRST              | N/A                  |
| GPP_B14  | MAIN | N-Z       | GPO                    | N_SPKR               |
| GPP_B18  | MAIN | N-Z       | GPO                    | N_GPP_B18            |
| GPP_B20  | MAIN | GPI       | N_GPP_B20              | P/U 8.2K 3VDUAL      |
| GPP_B22  | MAIN | GPI       | N_GPP_B22              | P/D 1K GND           |
| GPP_B23  | MAIN | GPO       | N_-PCH_HOT             | N/A                  |
| GPP_C0   | MAIN | SMBCLK    | N_SMBCLK               | P/U 1K 3VDUAL        |
| GPP_C1   | MAIN | SMBDATA   | N_SMBDATA              | P/U 1K 3VDUAL        |
| GPP_C2   | MAIN | N-Z       | GPO                    | N_GPP_C2             |
| GPP_C3   | MAIN | SMBCLK    | N_SMBCLK               | P/U 499 3VDUAL       |
| GPP_C4   | MAIN | SMBDATA   | N_SMBDATA              | P/U 499 3VDUAL       |
| GPP_C5   | MAIN | N-Z       | GPI                    | N_GPP_C5             |
| GPP_C6   | MAIN | GPI       | N_SMB1CLK              | P/U 8.2K 3VDUAL      |
| GPP_C7   | MAIN | GPI       | N_SMB1DAT              | P/U 8.2K 3VDUAL      |
| GPP_D4   | MAIN | GPI       | N_GPP_D4               | P/U 8.2K 3VDUAL      |
| GPP_D7   | MAIN | GPI       | N_GPP_D7               | N/A                  |
| GPP_D9   | MAIN | GPI       | N_GPP_D9               | P/U 1K VCC3          |
| GPP_D17  | MAIN | GPI       | N_GPP_D17              | P/U 8.2K VCC3        |
| GPP_D18  | MAIN | GPI       | N_GPP_D18              | P/U 8.2K VCC3        |
| GPP_D19  | MAIN | GPI       | N_GPP_D19              | P/U 8.2K VCC3        |
| GPP_D20  | MAIN | GPI       | N_GPP_D20              | P/U 8.2K VCC3        |
| GPP_D23  | MAIN | GPI       | N_GPP_D23              | P/U 8.2K 3VDUAL      |
| GPP_E0   | MAIN | NATIVE    | N_GPP_E0               | P/U 8.2K 3VDUAL      |
| GPP_E1   | MAIN | NATIVE    | N_GPP_E1               | P/U 8.2K 3VDUAL      |
| GPP_E2   | MAIN | NATIVE    | N_GPP_E2               | P/U 8.2K 3VDUAL      |
| GPP_E3   | MAIN | GPI       | N/A                    | N/A                  |
| GPP_E4   | MAIN | GPI       | N_DEVSLP0              | N/A                  |
| GPP_E6   | MAIN | GPI       | N_DEVSLP2              | N/A                  |
| GPP_E7   | MAIN | GPI       | N/A                    | N/A                  |
| GPP_E8   | MAIN | GPI       | N_-SATALED             | N/A                  |
| GPP_E9   | MAIN | N-Z       | GPI                    | N_-USB0C_F           |
| GPP_E10  | MAIN | N-Z       | GPI                    | N_-USB0C_R           |
| GPP_E11  | MAIN | N-Z       | GPI                    | N_-USB0C_R           |
| GPP_E12  | MAIN | N-Z       | GPI                    | N_-USB0C_F           |
| GPP_F0   | MAIN | NATIVE    | N_GPP_F0               | P/U 8.2K 3VDUAL      |
| GPP_F1   | MAIN | NATIVE    | N_GPP_F1               | P/U 8.2K 3VDUAL      |
| GPP_F2   | MAIN | NATIVE    | N_GPP_F2               | P/U 8.2K 3VDUAL      |
| GPP_F3   | MAIN | GPI       | N_GPP_F3               | P/U 8.2K 3VDUAL      |
| GPP_F4   | MAIN | GPI       | N_GPP_F4               | P/U 8.2K 3VDUAL      |
| GPP_F5   | MAIN | GPI       | N_GPP_F5               | P/U 8.2K VCC3        |
| GPP_F6   | MAIN | GPI       | N_DEVSLP4              | N/A                  |
| GPP_F10  | MAIN | GPI       | N_GPP_F10              | P/U 8.2K VCC3        |
| GPP_F11  | MAIN | GPI       | N_GPP_F11              | P/U 8.2K VCC3        |
| GPP_F12  | MAIN | GPI       | N_GPP_F12              | P/U 8.2K VCC3        |
| GPP_F13  | MAIN | GPI       | N_GPP_F13              | P/U 8.2K VCC3        |
| GPP_F14  | MAIN | GPI       | A_-SKT0CC              | P/U 8.2K VCC3        |
| GPP_F15  | MAIN | GPI       | N_-USB0C_F             | N/A                  |
| GPP_F16  | MAIN | GPI       | N_-USB0C_F             | N/A                  |
| GPP_F17  | MAIN | GPI       | N_-USB0C_R             | N/A                  |
| GPP_F18  | MAIN | GPI       | N_-USB0C_7             | P/U 8.2K 3VDUAL      |
| GPP_F22  | MAIN | GPI       | N_GPP_F22              | P/U 8.2K VCC3        |
| GPP_F23  | MAIN | GPI       | N_GPP_F23              | P/U 8.2K VCC3        |
| GPP_G0   | MAIN | GPI       | N_GPP_G0               | P/U 1K VCC3          |
| GPP_G1   | MAIN | GPI       | N_GPP_G1               | P/U 1K VCC3          |
| GPP_G12  | MAIN | GPI       | N_GPP_G12              | N/A                  |
| GPP_G13  | MAIN | GPI       | N_GPP_G13              | N/A                  |
| GPP_G14  | MAIN | GPI       | N_GT_S                 | P/U 8.2K VCC3        |
| GPP_G15  | MAIN | GPI       | N_CPU_S                | P/U 8.2K VCC3        |
| GPP_G16  | MAIN | GPI       | N/A                    | N/A                  |
| GPP_G18  | MAIN | GPI       | N_GPP_G18              | P/U 8.2K VCC3        |
| GPP_G19  | MAIN | GPI       | N_GPP_G19              | P/U 8.2K VCC3        |
| GPP_G20  | MAIN | GPI       | N_GPP_G20              | P/U 8.2K VCC3        |
| GPP_G21  | MAIN | GPI       | N_GPP_G21              | P/U 8.2K VCC3        |
| GPP_G22  | MAIN | GPI       | N_GPP_G22              | P/U 8.2K VCC3        |
| GPP_H0   | MAIN | GPI       | N_GPP_H0               | P/U 8.2K VCC3        |
| GPP_H1   | MAIN | GPO       | N_GPP_H1               | N/A                  |
| GPP_H19  | MAIN | GPI       | N_GPP_H19              | P/U 8.2K 3VDUAL      |
| GPP_H20  | MAIN | GPI       | N_GPP_H20              | P/U 8.2K 3VDUAL      |
| GPP_H21  | MAIN | GPI       | N_GPP_H21              | P/U 8.2K 3VDUAL      |

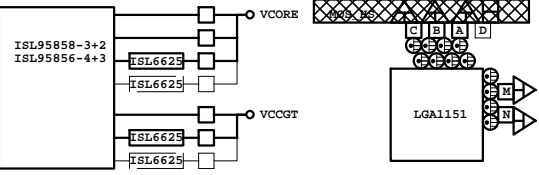
| PIN NAME | PWR  | Default  | USAGE           | NOTE                |
|----------|------|----------|-----------------|---------------------|
| GPP_H22  | MAIN | GPI      | N_GPP_H22       | P/U 8.2K 3VDUAL     |
| GPP_I0   | MAIN | GPI      | N_HDMI_HDP_F    | N/A                 |
| GPP_I1   | MAIN | GPI      | N_DVI_HDP_F     | P/U 1K VCC3         |
| GPP_I2   | MAIN | GPI      | N_DVI_HDP       | N/A                 |
| GPP_I3   | MAIN | GPI      | N_VGA_HDP_F     | N/A                 |
| GPP_I4   | MAIN | GPI      | N_GPP_I4        | P/D 100K GND        |
| GPP_I5   | MAIN | GPI      | N_DDPB_CTRLCLK  | P/U 2.2K VCC3       |
| GPP_I6   | MAIN | GPO      | N_DDPB_CTRLDATA | P/U 2.2K VCC3       |
| GPP_I7   | MAIN | GPI      | N_DDPB_CTRLCLK  | P/U 2.2K VCC3       |
| GPP_I8   | MAIN | GPI      | N_DDPB_CTRLDATA | P/U 2.2K VCC3       |
| GPP_I9   | MAIN | GPI      | N_DDPB_CTRLCLK  | P/U 2.2K VCC3       |
| GPP_I10  | MAIN | GPI      | N_DDPB_CTRLDATA | P/U 2.2K VCC3       |
| GPDI0    | STBY | BATLOW   | N_-BATLOW       | P/U 8.2K 3VDUAL_PCH |
| GPDI1    | STBY | ACPRESEN | N_GP_D1         | P/U 8.2K 3VDUAL_PCH |
| GPDI2    | STBY | LAN_WAKE | N_-LAN_WAKE     | P/U 8.2K 3VDUAL_PCH |
| GPDI3    | STBY | PWRBTN   | O_PWRBTWS       | P/U 8.2K 3VDUAL_PCH |
| GPDI4    | STBY | SLP_S3   | N_-SLP_S3       | N/A                 |
| GPDI5    | STBY | SLP_S4   | N_-SLP_S4       | N/A                 |
| GPDI6    | STBY | SLP_A    | N_-SLP_A        | N/A                 |
| GPDI7    | STBY | NATIVE   | N/A             | N/A                 |
| GPDI8    | STBY | SUSCLK   | N_SUSCLK        | P/D 1.5K GND        |
| GPDI10   | STBY | SLP_S5   | N_-SLP_S5       | N/A                 |
| GPDI11   | STBY | LANPHYC  | N_LAN_D1S-      | N/A                 |

Super I/O ITR8628 GPIO Table

| PIN NAME                       | USAGE                         | NOTE |
|--------------------------------|-------------------------------|------|
| PCIRST3#/GP10/VDIMM_RST_EN     | N/A                           |      |
| PCIRST2#/GP11                  | O_-PCIE_RST                   |      |
| PCIRST1#/GP12                  | O_-PFMRST2                    |      |
| SVC/PCIE_RST/GP14              | N_-THERMTRIP                  |      |
| SLP_SUS#/PCIRSTIN#/CIRTX2/GP15 | -PCIRSTIN                     |      |
| PSI_L/FAN_CLT5/CIRRX2/GP16     | <a href="#">PIN</a>           |      |
| RI2#/GP17                      | RI2-                          |      |
| THR_PWM_CTS2#/GP20             | CTS2-                         |      |
| IO_SM1#DCD2#/GP21              | DCD2-                         |      |
| SP1_S1/GP22                    | REEP-                         |      |
| DPWRCK/CPU_PU/GP23             | N_PCH_DPWRCK                  |      |
| FAN_TAC3/RTS2#/GP24            | RTS2-                         |      |
| FAN_TAC4/DBR2#/GP25            | DBR2-                         |      |
| INVT_OUT1/SCUT2/GP26           | TXD2                          |      |
| INVT_IN1/SLN2/GP27             | RXD2                          |      |
| ATXPG/GP30                     | PWOK                          |      |
| CTS1/GP31                      | CTS1-                         |      |
| OCWD13/RI18/GP32               | RI1-                          |      |
| OCWD12/DCD16/GP33              | DCD1-                         |      |
| VTT_PWRGD/GP34                 | VTT_PWRGD                     |      |
| VCC18_EN/GP35                  | VCCIO_EN                      |      |
| FAN_CTL3/GP36                  | <a href="#">PIN</a>           |      |
| FAN_TAC3/GP37                  | G_PLED                        |      |
| 3VSB5W#/GP40                   | <a href="#">PIN</a>           |      |
| OCWD11/SLN1/GP41               | RXD1                          |      |
| GP42/SC/FAN_CTL4               | N_-THERMTRIP                  |      |
| FAN5W#/GP43                    | -PWRBTWS                      |      |
| PWRON#/GP44                    | O_PWRBTWS                     |      |
| OCWD10/DSR18/GP45              | DSR1-                         |      |
| CE2_N/GP47/JP6                 | CEB_N                         |      |
| GP50/JP1                       | <a href="#">PIN</a>           |      |
| FAN_CTL2/GP51                  | FANPWM2                       |      |
| FAN_TAC2/GP52                  | FANIO2                        |      |
| SUSCK/GP53                     | N_-S4_S5                      |      |
| PME#/GP54                      | N_-LPCPME                     |      |
| RSMRST#/CIRRX1/GP55            | O_-RSMRST                     |      |
| MCLK/FAN_TAC6/GP56             | MCLK                          |      |
| MDAT7/FAN_CTL6/GP57            | MDAT                          |      |
| KCLK/GP60                      | KCLK                          |      |
| KDAT7/GP61                     | KDAT                          |      |
| KRSTW/GP62                     | N_-KBRST                      |      |
| HOLD_B#/GP63                   | <a href="#">PIN</a>           |      |
| HOLD_B#/GP64                   | <a href="#">PIN</a>           |      |
| VLDI7_EN/PCIE_D0/GP65          | MB_ID2                        |      |
| VCC1_05_EN/GP66                | VCC1_0_EN                     |      |
| GP67                           | <a href="#">PIN</a>           |      |
| USB_F61/PD0/GP70               | PD0                           |      |
| USB_F62/PD1/GP71               | PD1                           |      |
| USB_F63/PD2/GP72               | PD2                           |      |
| USB_F63/PD3/GP73               | PD3                           |      |
| USB_F65/PD4/GP74               | PD4                           |      |
| USB_F66/PD5/GP75               | PD5                           |      |
| USB_F67/PD7/GP76               | PD6                           |      |
| USB_F68/PD8/GP77               | PD7                           |      |
| LS-IN1/SLCT/GP80               | SLCT                          |      |
| LS_OUT1/PE/GP81                | PE                            |      |
| LS_IN2/BUSY/GP82               | BUSY                          |      |
| LS_OUT2/ACK8/GP83              | ACK-                          |      |
| IPHONE_CHARGE#/SLIN#/GP84      | SLIN-                         |      |
| OC_IN/INIT8/GP85               | INIT-                         |      |
| OC_OUT/APD8/GP86               | APD-                          |      |
| USB_OC2/STB8/GP87              | STB-                          |      |
| DDR_EN/GP90                    | MA_EN                         |      |
| PWRLED/GP91                    | MPD-                          |      |
| HOLD_OUT/GP92                  | <a href="#">PIN</a>           |      |
| HDLED_IN/GP93                  | GP93                          |      |
| PROCHOT#/GP94                  | -PROCHOT_CON                  |      |
| CPUPWRGD/GP95                  | <a href="#">PIN</a> CPU_PWRCK |      |
| PCH_VRMPWRGD/GP96              | N_PCH_VRMPWRGD                |      |
| VR_RDY/GP97                    | VR_RDY                        |      |



PWM各相位的擺法如下:



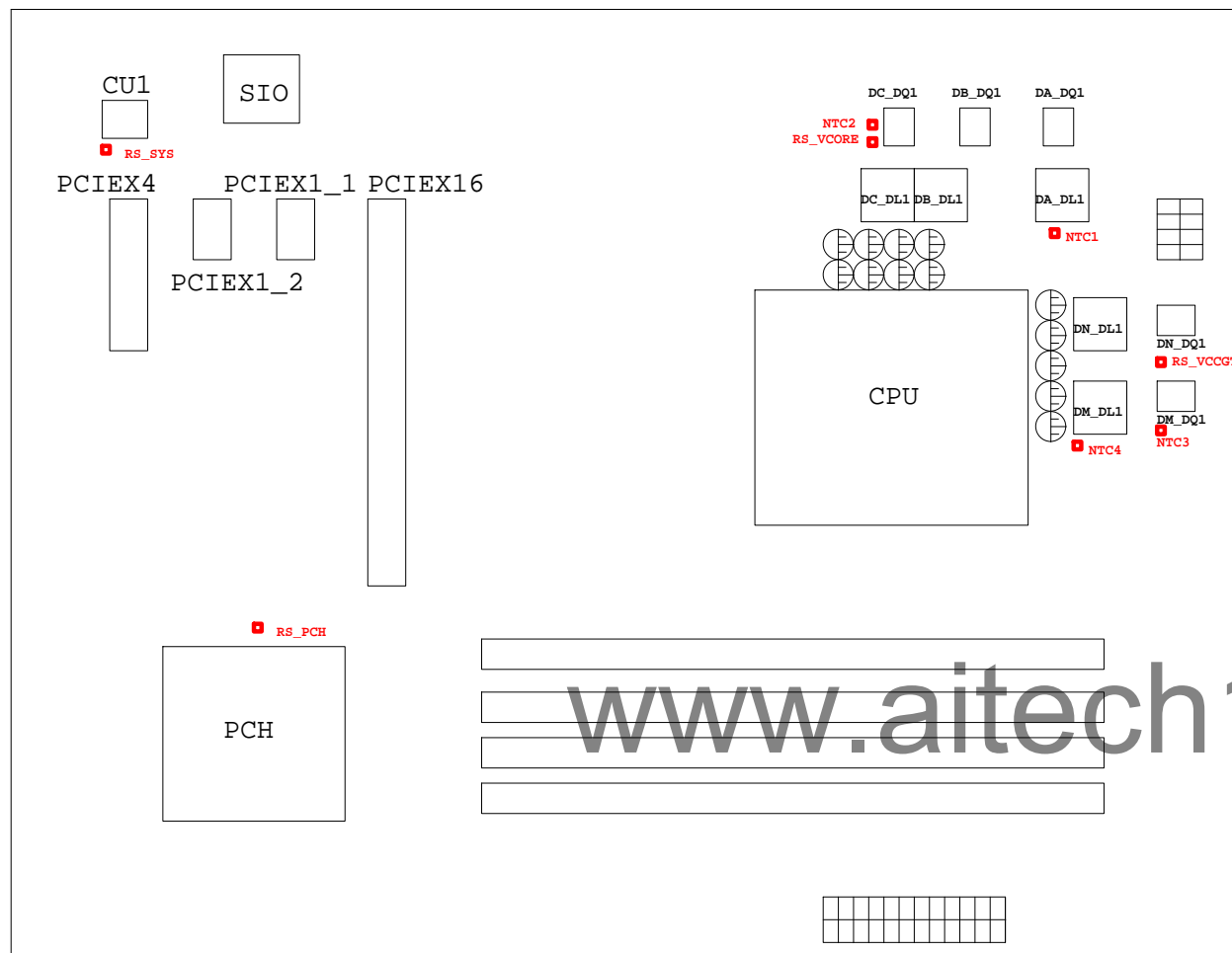
BIOS超電壓對應表:

| 線路圖名稱              | BIOS選項                   |
|--------------------|--------------------------|
| Vcore              | CPU Vcore                |
| VCCGT              | CPU Graphic Voltage      |
| VCCSA              | CPU System Agent Voltage |
| VCCIO              | CPU I/O Voltage          |
| VCC1_0_PCH         | CPU Vcore                |
| VDDQ               | DRAM voltage             |
| VPP_25V            | DRAM VPP voltage         |
| DDRVTT             | DRAM Terminatio          |
| VREF_DQ_AVREF_DQ_B | DRAM Data Ref            |

散熱模組料號:

Q170M-MK :  
PCH : 12SP2-030005-51R / 53R  
MOSFET : N/A

|          | 3 pin FAN control | 4 pin FAN control | FAN speed | Controller |
|----------|-------------------|-------------------|-----------|------------|
| CPU FAN  | +12V              | FANPWM1           | FANIO1    | IT8628     |
| SYS FAN1 | FANPWM2           | VCC               | FANIO2    | IT8628     |
|          | FAN1_VOUT         | N/A               | N/A       | NCT3941    |



| 熱敏電阻     | 擺放靠近位置 | 走線方式         |
|----------|--------|--------------|
| NTC1     | DM_DL1 | Differential |
| NTC2     | DA_DL1 | Differential |
| NTC3     | DA_DQ1 | Differential |
| NTC4     | DM_DQ1 | Differential |
| RS_VCORE | DC_DQ1 | N/A          |
| RS_VCCGT | DN_DQ1 | N/A          |
| RS_PCH   | PCH    | N/A          |
| RS_SYS   | CU1    | N/A          |