

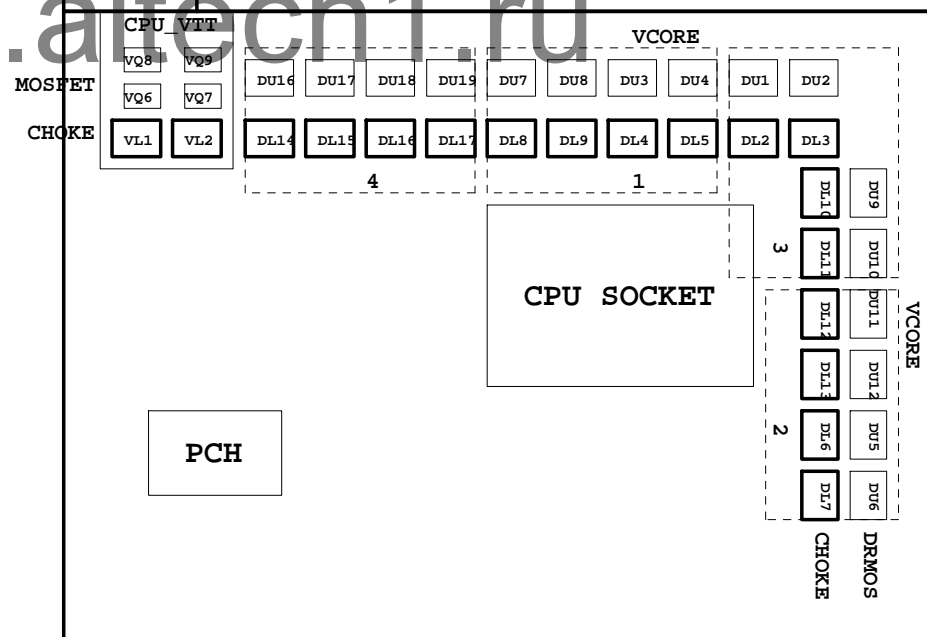
# Model Name: GA-Z87X-OC-Force

SHEET TITLE Rev1.1

|       |                            |
|-------|----------------------------|
| 01    | COVER SHEET                |
| 02    | BOM & PCB MODIFY HISTORY   |
| 03    | BLOCK DIAGRAM              |
| 04    | CPU_LGA1155-A              |
| 05    | CPU_LGA1155-B              |
| 06    | CPU_LGA1155-C              |
| 07    | DDR III CHANNEL A          |
| 08    | DDR III CHANNEL B          |
| 09    | PCH_FDI,DMI,USB,PCIE,NVRAM |
| 10    | PCH_DP,CLK BUFFER          |
| 11    | PCH_HOST,SATA,PCI          |
| 12    | PCH_GPIO,CTRL,AUDIO        |
| 13    | PCH_PWR,GND                |
| 14    | PCI EXPRESS*16 SLOT_3      |
| 15    | PCI EXPRESS*16/*8 SWITCH_2 |
| 16    | PCI EXPRESS*8 SLOT_2       |
| 17    | PCI EXPRESS*16 SLOT_1      |
| 18    | PCI EXPRESS*16/*8 SWITCH_1 |
| 19    | PCI EXPRESS*8 SLOT_1       |
| 20    | PCI EXPRESS*1 SLOTS X1     |
| 21    | HDMI/DVI/DP                |
| 22    | Dual BIOS , TPM SLB9635TT  |
| 23    | ALC 898                    |
| 24    | REAR AUDIO JACK            |
| 25    | AMplifier                  |
| 26-28 | IR 3563A+IR3550-Vcore      |
| 29    | DISCRETE POWER1            |
| 30    | DISCRETE POWER2            |
| 31    | ITE 8728 LPC IO            |
| 32    | FP,FUSB,-PHOT              |
| 33    | ATX POWER, CLOCK GEN       |
| 34    | HWM,KB/MS , FAN CTRL       |
| 35    | INTEL LAN I217             |
| 36    | INTEL LAN I210             |
| 37    | Marvell 9230               |
| 38-39 | IR3570A+IR3550-DDR15 POWER |

SHEET TITLE

|       |                            |
|-------|----------------------------|
| 40    | COM PORT                   |
| 41    | RST, PWR, CLR_CMOS         |
| 42    | PEX8747S UPSTREAM & MISC   |
| 43    | PEX8747S DOWNSTREAM SLOTS  |
| 44    | PEX8747S STRAP & CPLD INTF |
| 45    | PEX8747S POWER             |
| 46    | REFCLK                     |
| 47    | PEX8747 POWER DESIGN       |
| 48    | SWITCH                     |
| 49    | PCI EXPRESS X16 SWITCH_3-1 |
| 50    | PCI EXPRESS X16 SWITCH_3-2 |
| 51    | PCI EXPRESS X16 PORT_2     |
| 52    | IT8790                     |
| 53    | FAN CTRL                   |
| 54-56 | D720210 4port_Hub - Rear   |
| 57-59 | D720210 4port_Hub - Front  |
| 60    | TABLE LIST                 |

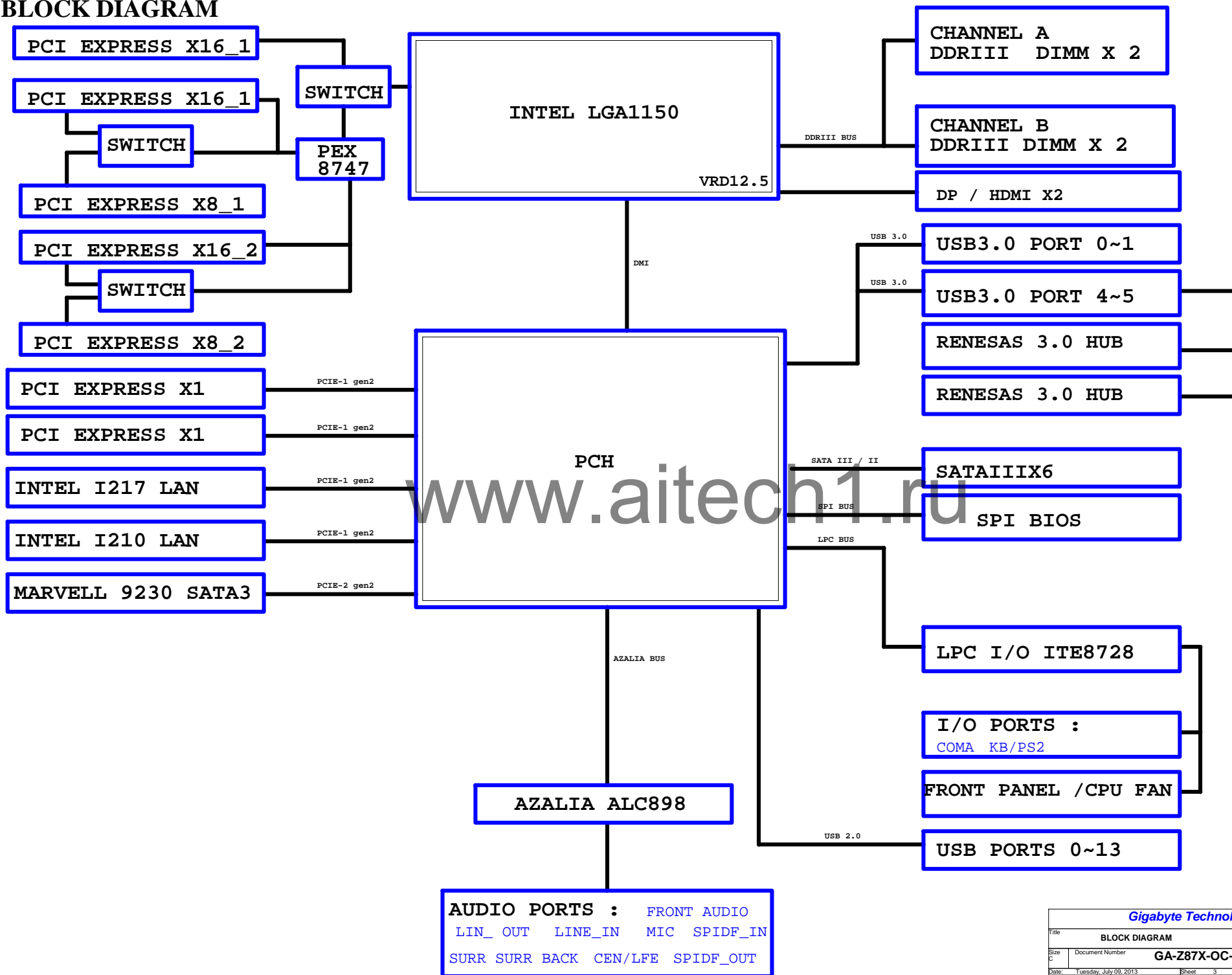


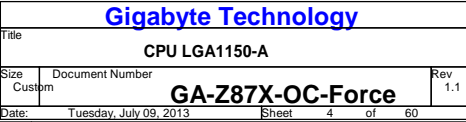
Gigabyte Technology

|        |  |                        |  |
|--------|--|------------------------|--|
| Title  |  | Cover Sheet            |  |
| Size   |  | Document Number        |  |
| Custom |  | GA-Z87X-OC-Force       |  |
| Date:  |  | Tuesday, July 09, 2013 |  |
| Sheet  |  | 1 of 60                |  |

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## BLOCK DIAGRAM





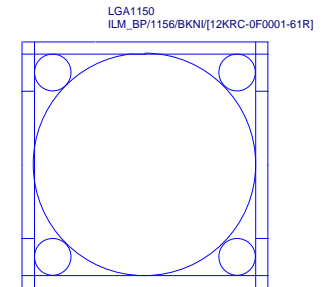


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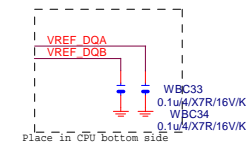
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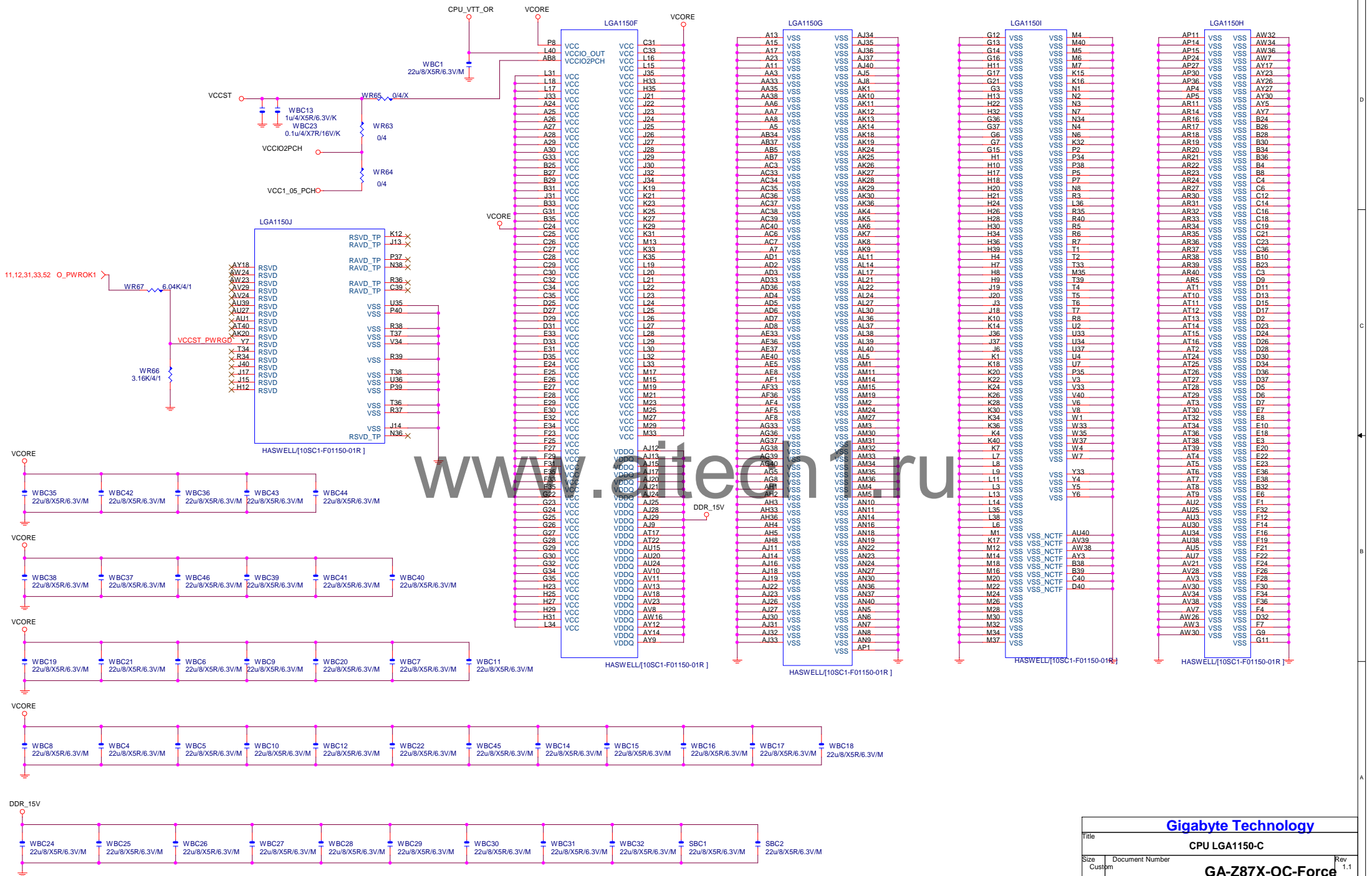
| LGA1150B |      |              |           |      |       |
|----------|------|--------------|-----------|------|-------|
| MAA80    | AL19 | DDR1_M0      | DDR1_D00  | AE34 | MD80  |
| MAA81    | AK23 | DDR1_M1      | DDR1_D01  | AE35 | MD81  |
| MAA82    | AM22 | DDR1_M2      | DDR1_D02  | AG35 | MD82  |
| MAA83    | AM23 | DDR1_M3      | DDR1_D03  | AH35 | MD83  |
| MAA84    |      | DDR1_M4      | DDR1_D04  | AD34 | MD84  |
| MAA85    | AL23 | DDR1_M4      | DDR1_D05  | AD35 | MD85  |
| MAA86    | AY24 | DDR1_M6      | DDR1_D06  | AG34 | MD86  |
| MAA87    | AV25 | DDR1_M7      | DDR1_D07  | AH34 | MD87  |
| MAA88    | AU26 | DDR1_M8      | DDR1_D08  | AL34 | MD88  |
| MAA89    | AW25 | DDR1_M8      | DDR1_D09  | AL35 | MD89  |
| MAA810   | AP18 | DDR1_M10     | DDR1_D010 | AK31 | MD810 |
| MAA811   | AP18 | DDR1_M10     | DDR1_D011 | AK31 | MD811 |
| MAA812   | AV26 | DDR1_M12     | DDR1_D012 | AK34 | MD812 |
| MAA813   | AR15 | DDR1_M12     | DDR1_D013 | AK35 | MD813 |
| MAA814   | AV27 | DDR1_M14     | DDR1_D014 | AK32 | MD814 |
| MAA815   | AY28 | DDR1_M15     | DDR1_D015 | AL32 | MD815 |
|          |      |              | DDR1_D016 | AN34 | MD816 |
| MODT_B0  | AM17 | DDR1_D070    | DDR1_D016 | AP34 | MD817 |
| MODT_B1  | AL16 | DDR1_D071    | DDR1_D018 | AN31 | MD819 |
| MODT_B2  | AM16 | DDR1_D072    | DDR1_D019 | AP31 | MD823 |
| MODT_B3  | AK15 | DDR1_D073    | DDR1_D020 | AN35 | MD820 |
|          |      |              | DDR1_D021 | AP35 | MD826 |
|          | AM26 | DDR1_EC00    | DDR1_D022 | AN32 | MD818 |
|          | AM25 | DDR1_EC01    | DDR1_D023 | AP32 | MD825 |
|          | AP25 | DDR1_EC01    | DDR1_D024 | AM28 | MD822 |
|          | AP26 | DDR1_EC02    | DDR1_D024 | AM28 | MD828 |
|          | AP26 | DDR1_EC03    | DDR1_D025 | AR28 | MD827 |
|          | AR25 | DDR1_EC04    | DDR1_D027 | AR28 | MD830 |
|          | AR25 | DDR1_EC05    | DDR1_D028 | AL28 | MD824 |
|          | AR26 | DDR1_EC06    | DDR1_D028 | AL29 | MD829 |
|          | AR25 | DDR1_EC07    | DDR1_D029 | AP29 | MD826 |
|          |      | DDR1_D030    | DDR1_D031 | AP28 | MD831 |
| SBAB0    | AK17 | DDR1_BA0     | DDR1_D031 | AR12 | MD832 |
| SBAB1    | AL18 | DDR1_BA1     | DDR1_D032 | AR12 | MD833 |
| SBAB2    | AW18 | DDR1_BA2     | DDR1_D033 | AP12 | MD834 |
|          |      |              | DDR1_D034 | AL12 | MD835 |
| CKE80    | AW29 | DDR1_CKE0    | DDR1_D035 | AR13 | MD836 |
| CKE81    | AY29 | DDR1_CKE1    | DDR1_D036 | AP13 | MD837 |
| CKE82    | AU28 | DDR1_CKE2    | DDR1_D037 | AM13 | MD838 |
| CKE83    | AU29 | DDR1_CKE3    | DDR1_D038 | AM12 | MD839 |
|          |      |              | DDR1_D039 | AR9  | MD845 |
| CSB0     | AN17 | DDR1_CS_N0   | DDR1_D040 | AP9  | MD841 |
| CSB1     | AN15 | DDR1_CS_N1   | DDR1_D041 | AR6  | MD846 |
| CSB2     | AN17 | DDR1_CS_N2   | DDR1_D042 | AP6  | MD843 |
| CSB3     | AL15 | DDR1_CS_N3   | DDR1_D043 | AR10 | MD844 |
|          |      |              | DDR1_D044 | AP10 | MD840 |
|          |      |              | DDR1_D045 | AR7  | MD846 |
|          |      |              | DDR1_D046 | AP7  | MD842 |
| CLKB0    | AM20 | DDR1_CLK_P0  | DDR1_D048 | AM9  | MD853 |
| CLKB0    | AM20 | DDR1_CLK_P0  | DDR1_D048 | AL9  | MD852 |
| CLKB1    | AP22 | DDR1_CLK_P1  | DDR1_D049 | AL6  | MD850 |
| CLKB1    | AP21 | DDR1_CLK_P1  | DDR1_D050 | AL7  | MD850 |
|          |      | DDR1_CLK_N1  | DDR1_D051 | AL10 | MD848 |
| CLKB2    | AN20 | DDR1_CLK_P2  | DDR1_D052 | AL10 | MD849 |
| CLKB3    | AN21 | DDR1_CLK_P2  | DDR1_D053 | AM6  | MD854 |
| CLKB3    | AP19 | DDR1_CLK_N2  | DDR1_D054 | AM7  | MD851 |
| CLKB3    | AP19 | DDR1_CLK_N2  | DDR1_D055 | AM6  | MD861 |
|          |      | DDR1_CLK_N3  | DDR1_D056 | AM7  | MD860 |
| SCASB    | AP16 | DDR1_CAS*    | DDR1_D057 | AM8  | MD859 |
|          | AL20 | DDR1_SV0     | DDR1_D058 | AM7  | MD863 |
| SCASB    | AM18 | DDR1_RAS*    | DDR1_D059 | AM6  | MD856 |
| SWFB     | AK16 | DDR1_WE*     | DDR1_D061 | AF7  | MD857 |
|          |      |              | DDR1_D062 | AF6  | MD858 |
|          | AB39 | DDR_VREF_D00 | DDR1_D063 | AF7  | MD862 |
|          | AB40 | DDR_VREF_D01 | DDR1_D064 | AF35 | QDSB0 |
|          |      |              | DDR1_D065 | AF33 | QDSB2 |
|          |      |              | DDR1_D066 | AN28 | QDSB3 |
|          |      |              | DDR1_D067 | AN12 | QDSB4 |
|          |      |              | DDR1_D068 | AP8  | QDSB5 |
|          |      |              | DDR1_D069 | AL8  | QDSB6 |
|          |      |              | DDR1_D070 | AG7  | QDSB7 |
|          |      |              | DDR1_D071 | AN25 | QDSB8 |
|          |      |              | DDR1_D072 | AF34 | QDSB9 |
|          |      |              | DDR1_D073 | AK33 | QDSB1 |
|          |      |              | DDR1_D074 | AN33 | QDSB2 |
|          |      |              | DDR1_D075 | AN29 | QDSB3 |
|          |      |              | DDR1_D076 | AN13 | QDSB4 |
|          |      |              | DDR1_D077 | AM6  | QDSB5 |
|          |      |              | DDR1_D078 | AM6  | QDSB6 |
|          |      |              | DDR1_D079 | AG6  | QDSB7 |
|          |      |              | DDR1_D080 | AN26 | QDSB8 |
|          |      |              | DDR1_D081 | AK33 | QDSB9 |
|          |      |              | DDR1_D082 | AN33 | QDSB1 |
|          |      |              | DDR1_D083 | AN29 | QDSB2 |
|          |      |              | DDR1_D084 | AN13 | QDSB3 |
|          |      |              | DDR1_D085 | AM6  | QDSB4 |
|          |      |              | DDR1_D086 | AM6  | QDSB5 |
|          |      |              | DDR1_D087 | AG6  | QDSB6 |
|          |      |              | DDR1_D088 | AN26 | QDSB7 |
|          |      |              | DDR1_D089 | AK33 | QDSB8 |
|          |      |              | DDR1_D090 | AN33 | QDSB9 |

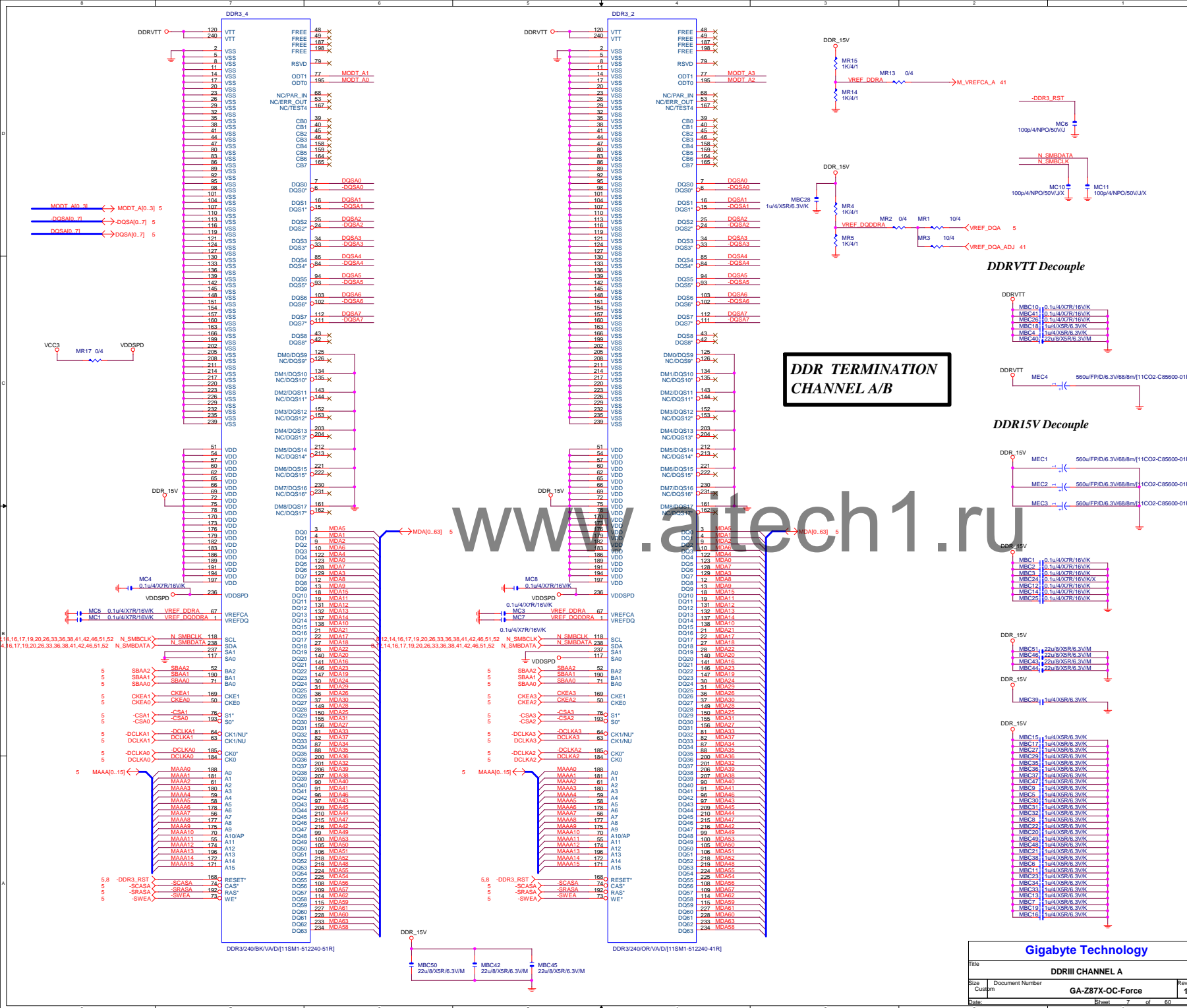
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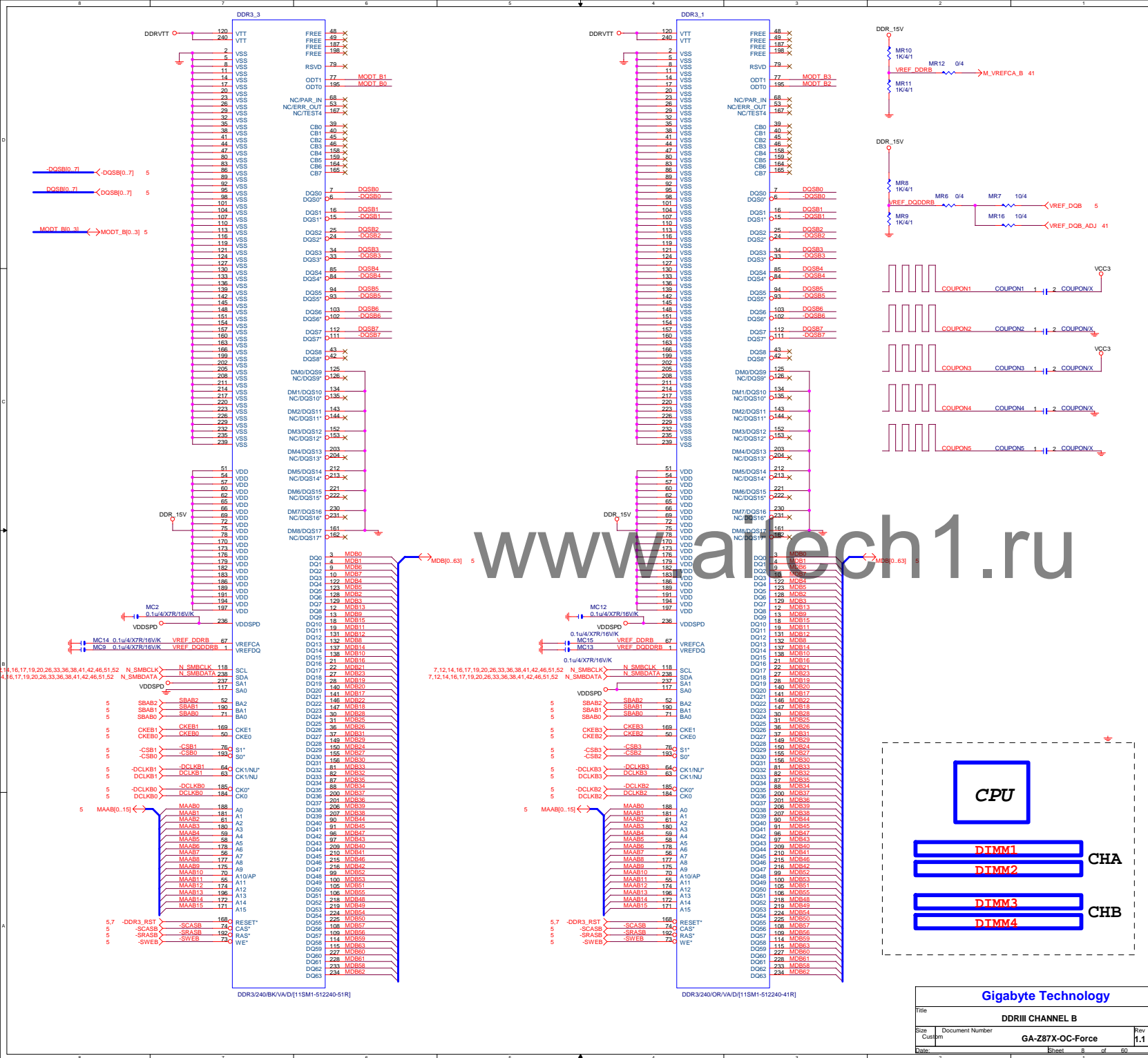


Need check the new CPU ME





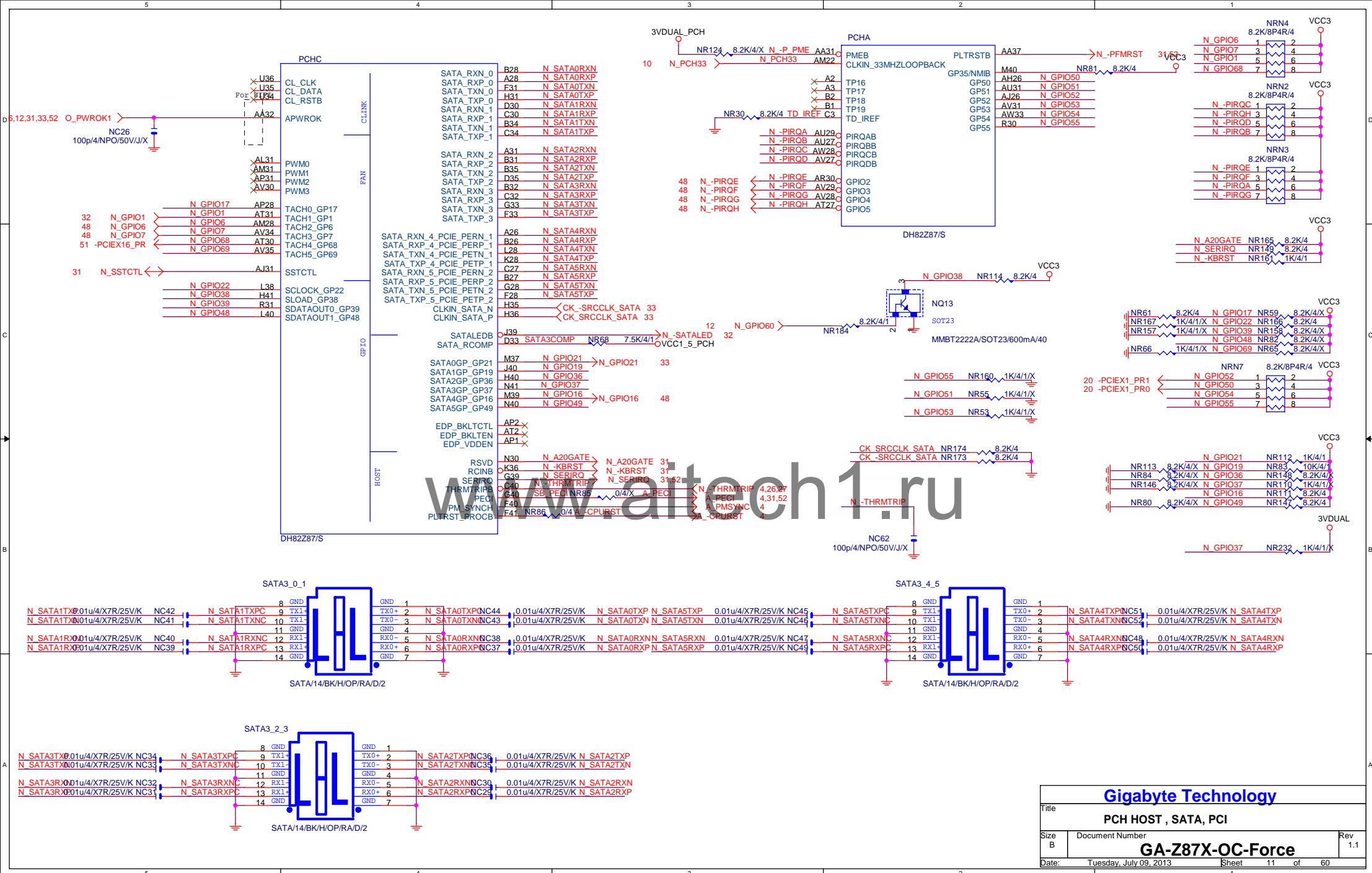




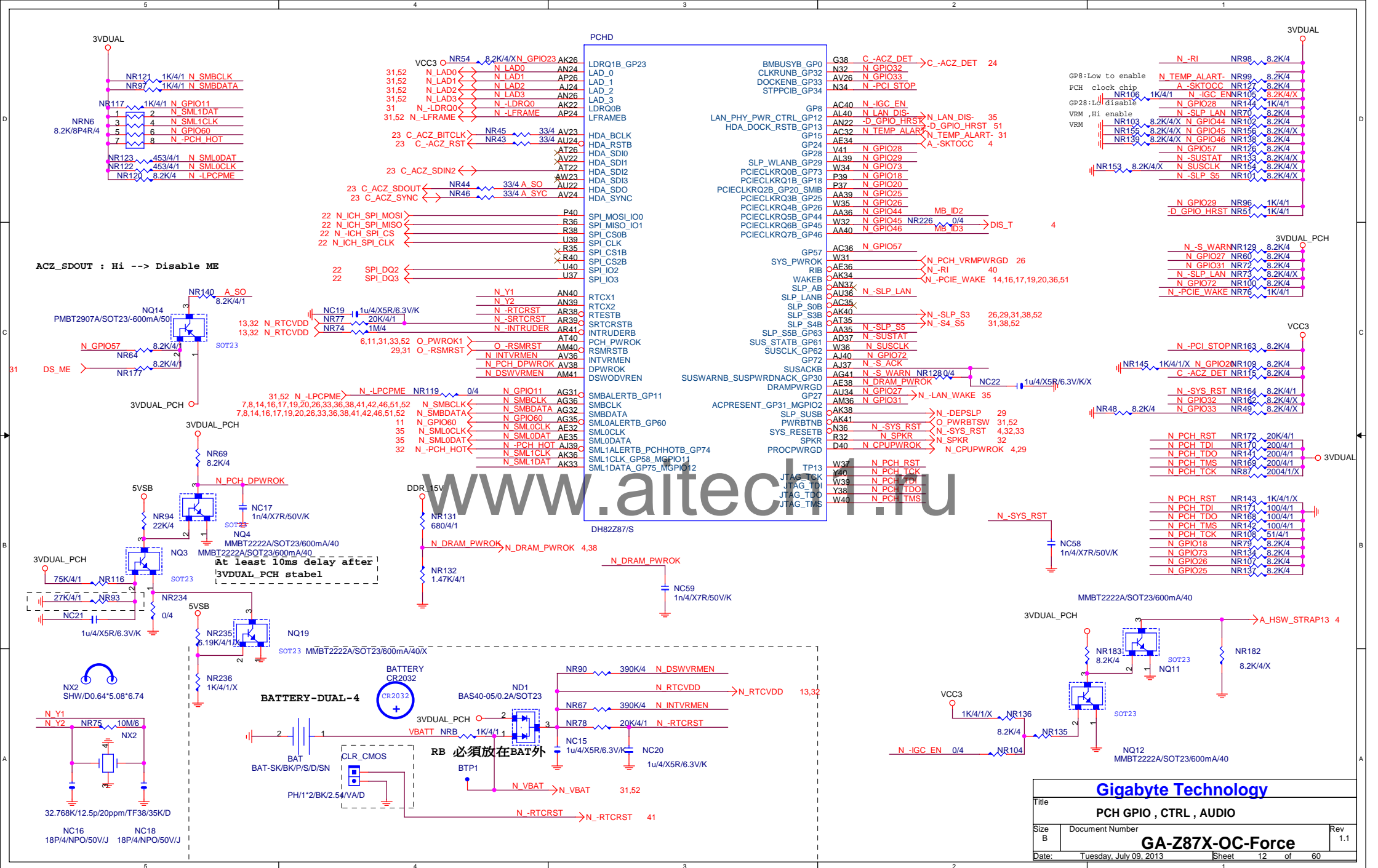




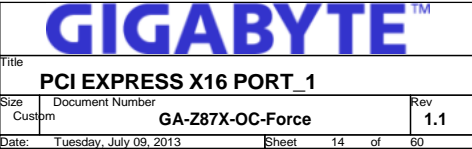


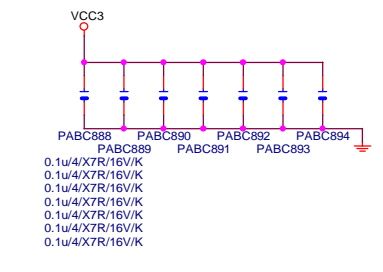
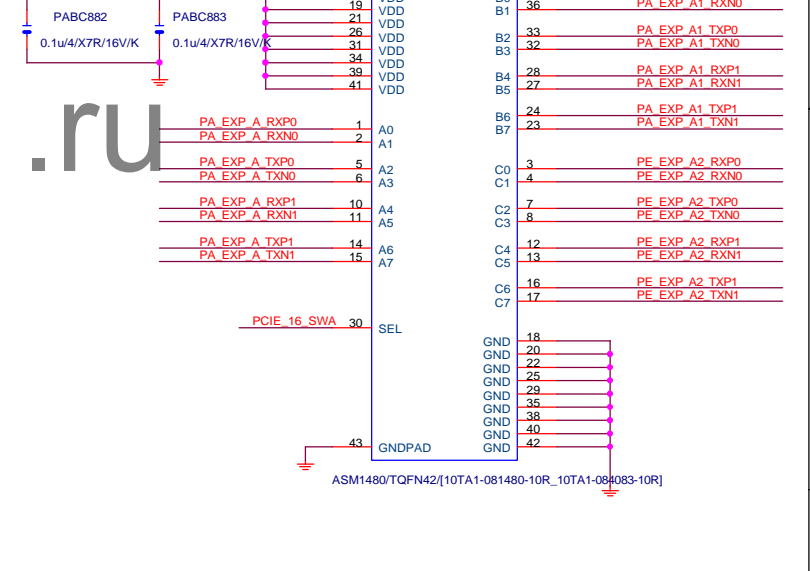
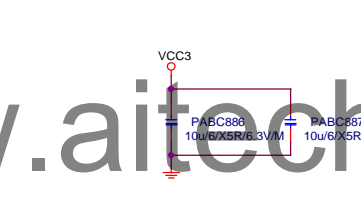
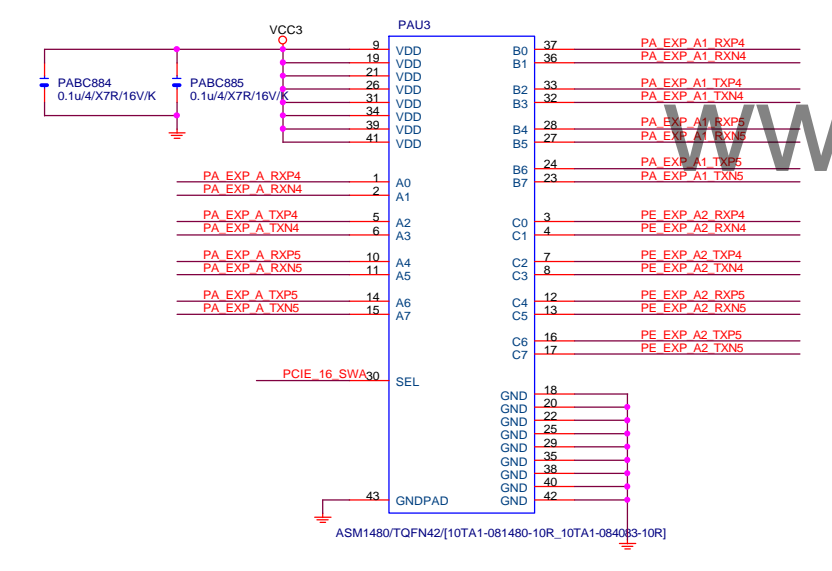
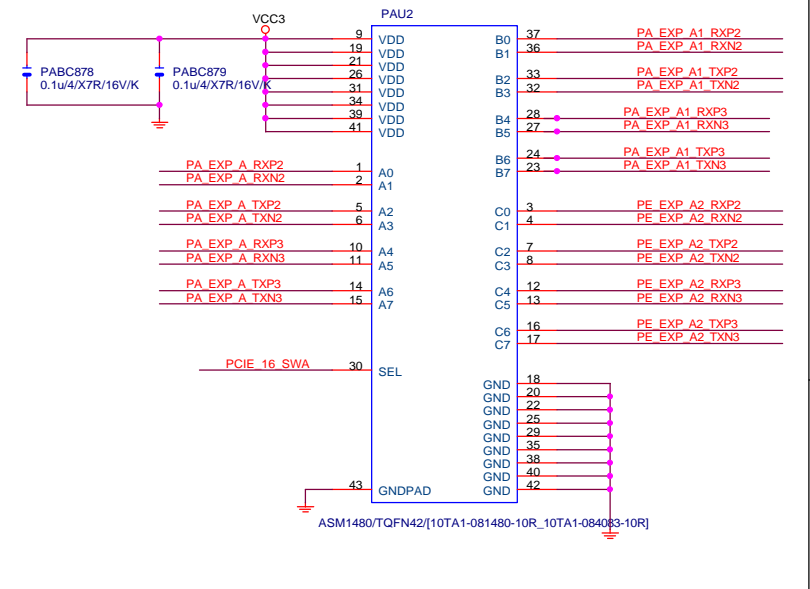
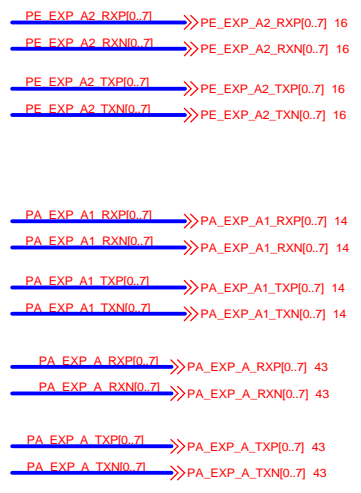
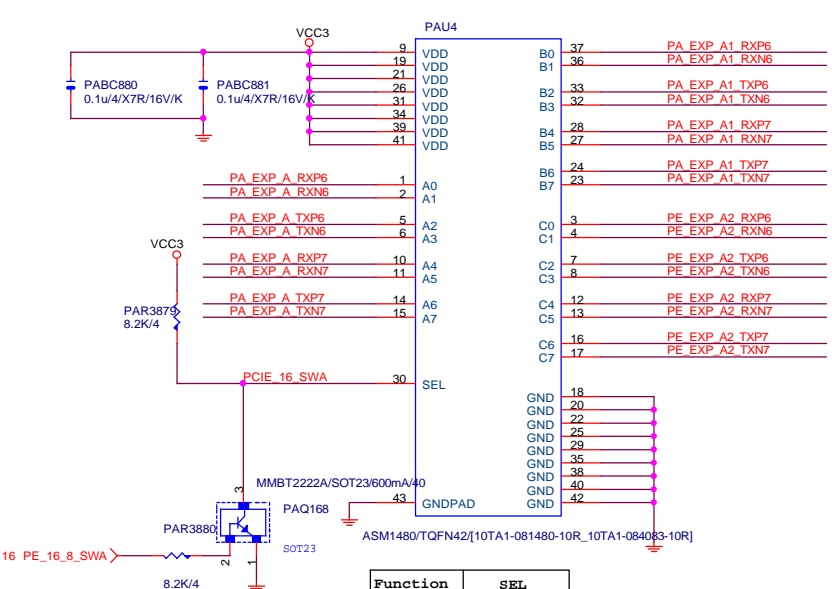


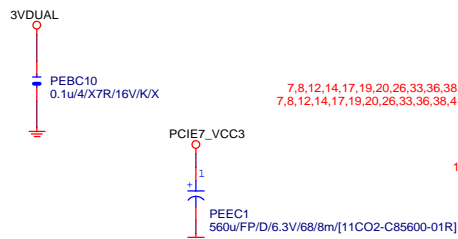






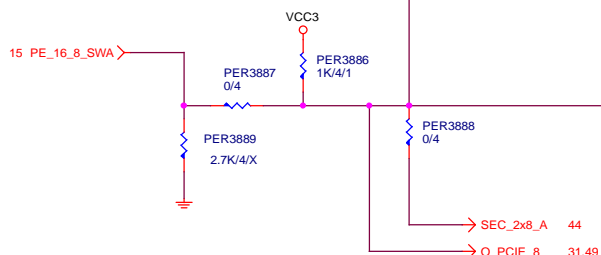




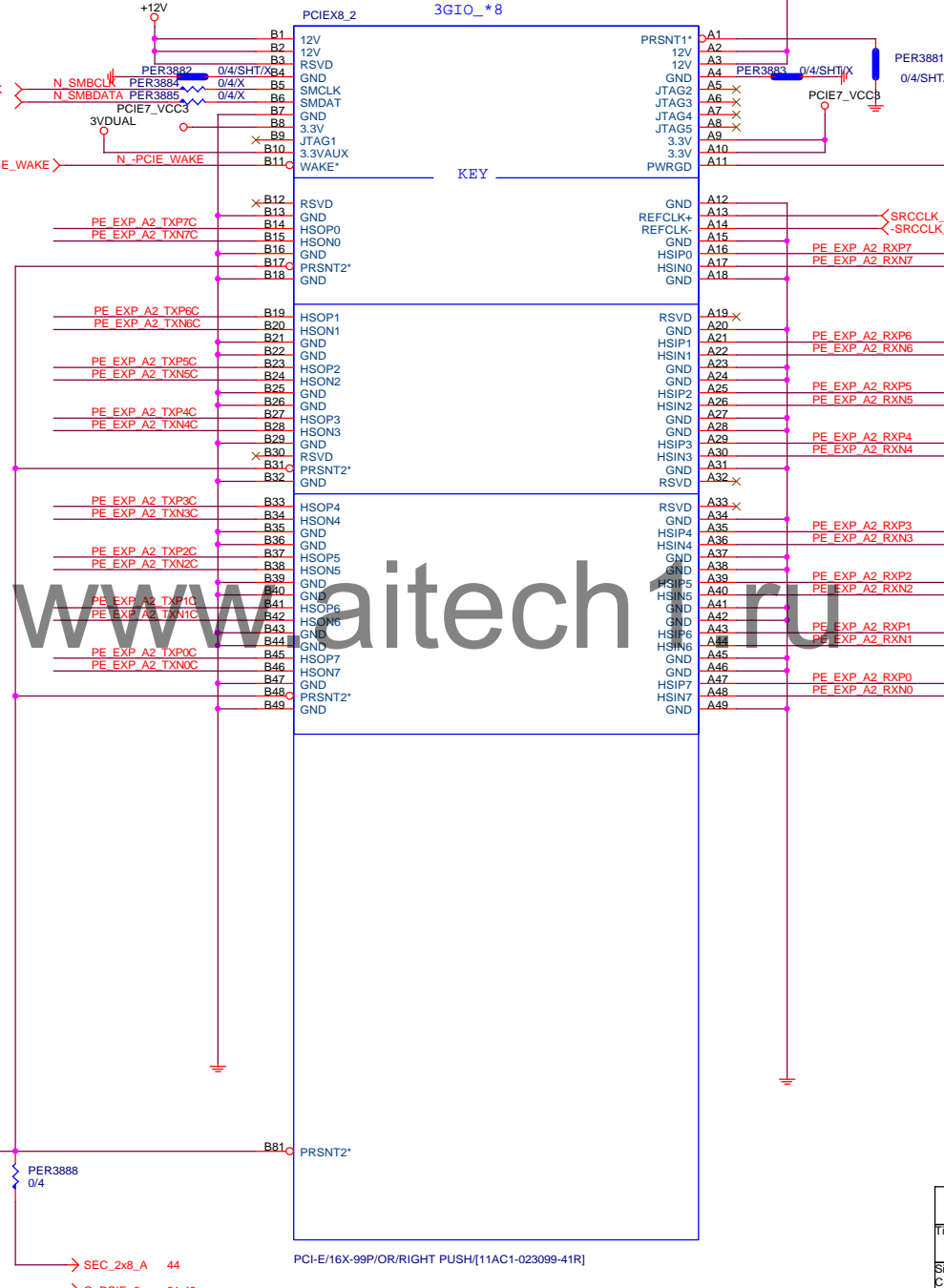


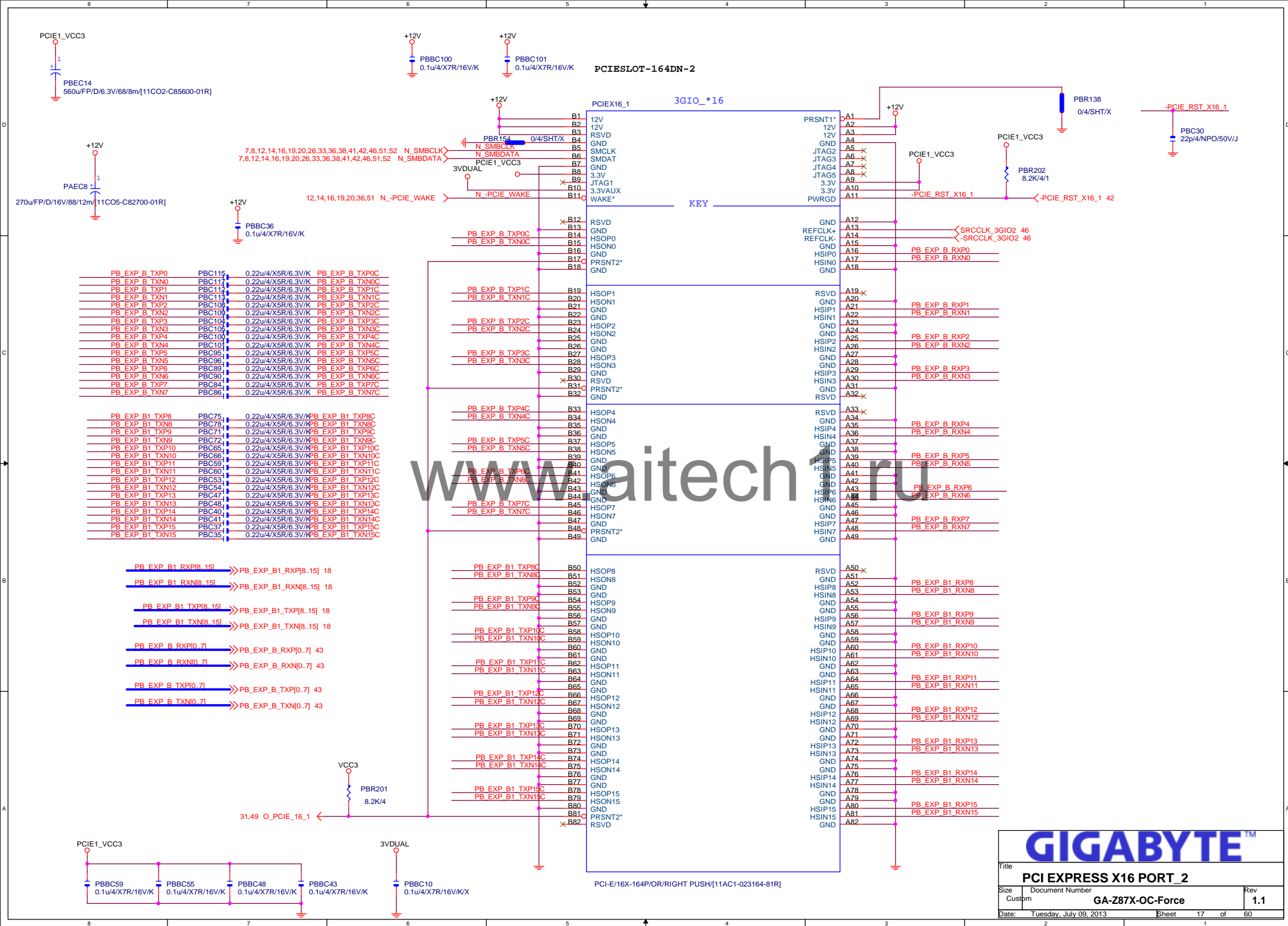
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PE\_EXP\_A2\_TXN0..71 >>> PE\_EXP\_A2\_TXN[0..7] 15

|                |        |                   |                 |
|----------------|--------|-------------------|-----------------|
| PE_EXP_A2_TXP7 | PEC231 | 0.22u/4X5R/6.3V/K | PE_EXP_A2_TXP7C |
| PE_EXP_A2_TXN7 | PEC232 | 0.22u/4X5R/6.3V/K | PE_EXP_A2_TXN7C |
| PE_EXP_A2_TXP6 | PEC233 | 0.22u/4X5R/6.3V/K | PE_EXP_A2_TXP6C |
| PE_EXP_A2_TXN6 | PEC234 | 0.22u/4X5R/6.3V/K | PE_EXP_A2_TXN6C |
| PE_EXP_A2_TXP5 | PEC235 | 0.22u/4X5R/6.3V/K | PE_EXP_A2_TXP5C |
| PE_EXP_A2_TXN5 | PEC236 | 0.22u/4X5R/6.3V/K | PE_EXP_A2_TXN5C |
| PE_EXP_A2_TXP4 | PEC237 | 0.22u/4X5R/6.3V/K | PE_EXP_A2_TXP4C |
| PE_EXP_A2_TXN4 | PEC238 | 0.22u/4X5R/6.3V/K | PE_EXP_A2_TXN4C |
| PE_EXP_A2_TXP3 | PEC239 | 0.22u/4X5R/6.3V/K | PE_EXP_A2_TXP3C |
| PE_EXP_A2_TXN3 | PEC240 | 0.22u/4X5R/6.3V/K | PE_EXP_A2_TXN3C |
| PE_EXP_A2_TXP2 | PEC241 | 0.22u/4X5R/6.3V/K | PE_EXP_A2_TXP2C |
| PE_EXP_A2_TXN2 | PEC242 | 0.22u/4X5R/6.3V/K | PE_EXP_A2_TXN2C |
| PE_EXP_A2_TXP1 | PEC243 | 0.22u/4X5R/6.3V/K | PE_EXP_A2_TXP1C |
| PE_EXP_A2_TXN1 | PEC244 | 0.22u/4X5R/6.3V/K | PE_EXP_A2_TXN1C |
| PE_EXP_A2_TXP0 | PEC245 | 0.22u/4X5R/6.3V/K | PE_EXP_A2_TXP0C |
| PE_EXP_A2_TXN0 | PEC246 | 0.22u/4X5R/6.3V/K | PE_EXP_A2_TXN0C |

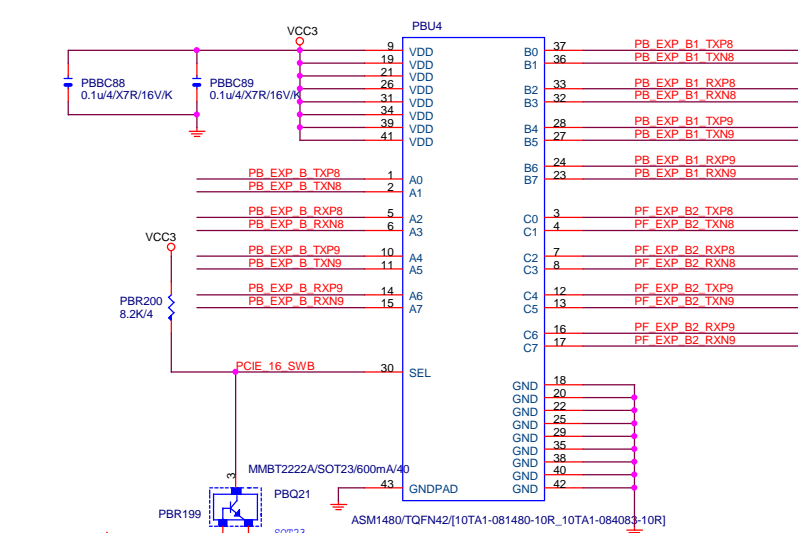


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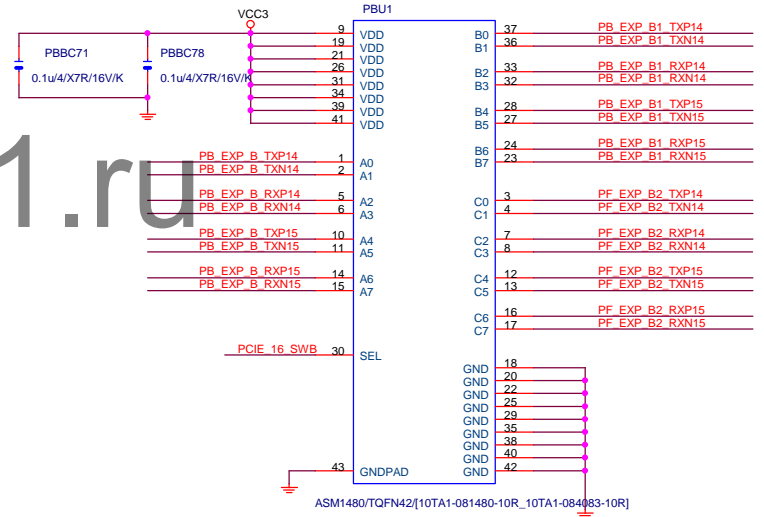
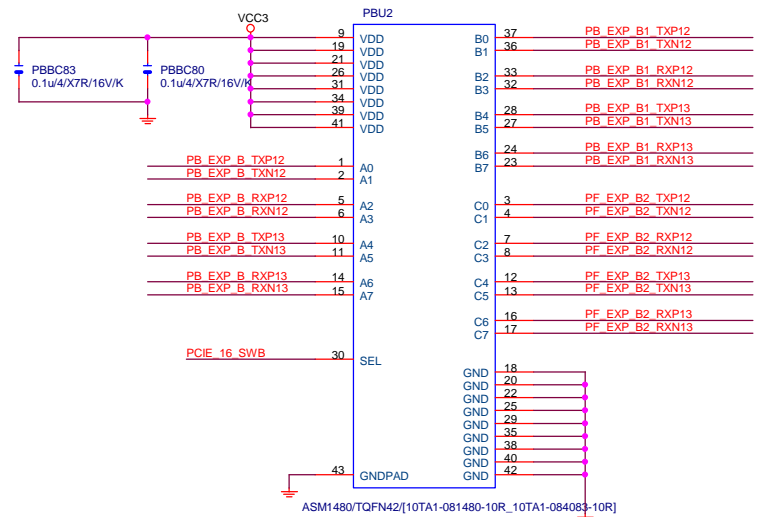
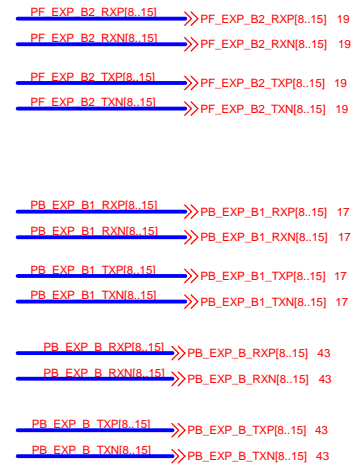
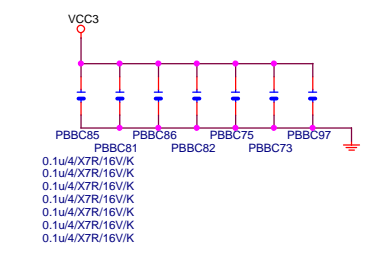
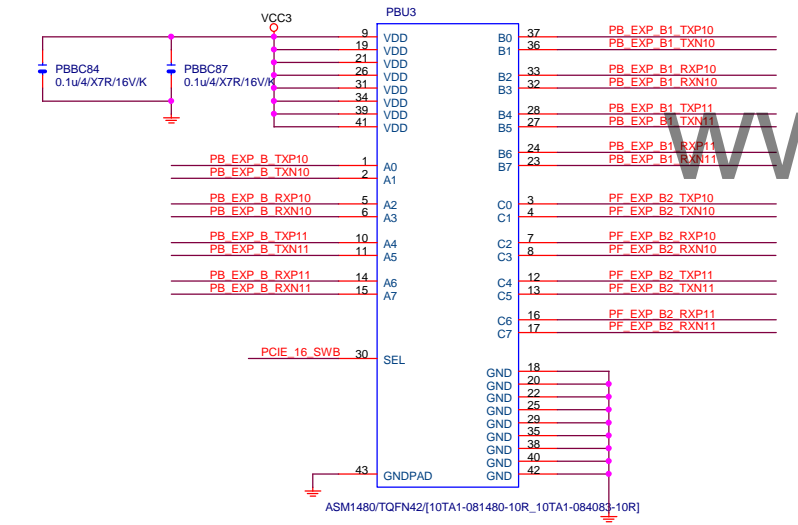








| Function | SEL |
|----------|-----|
| A--> B   | L   |
| A--> C   | H   |



Title

**PCI EXPRESS X16 SWITCH\_2**

Size Custom

Document Number

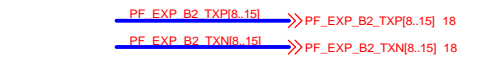
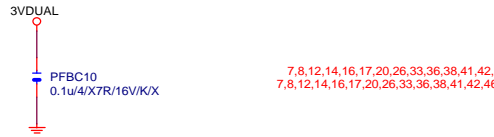
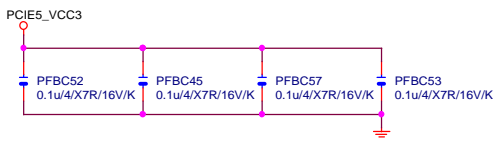
**GA-Z87X-OC-Force**

Date: Tuesday, July 09, 2013

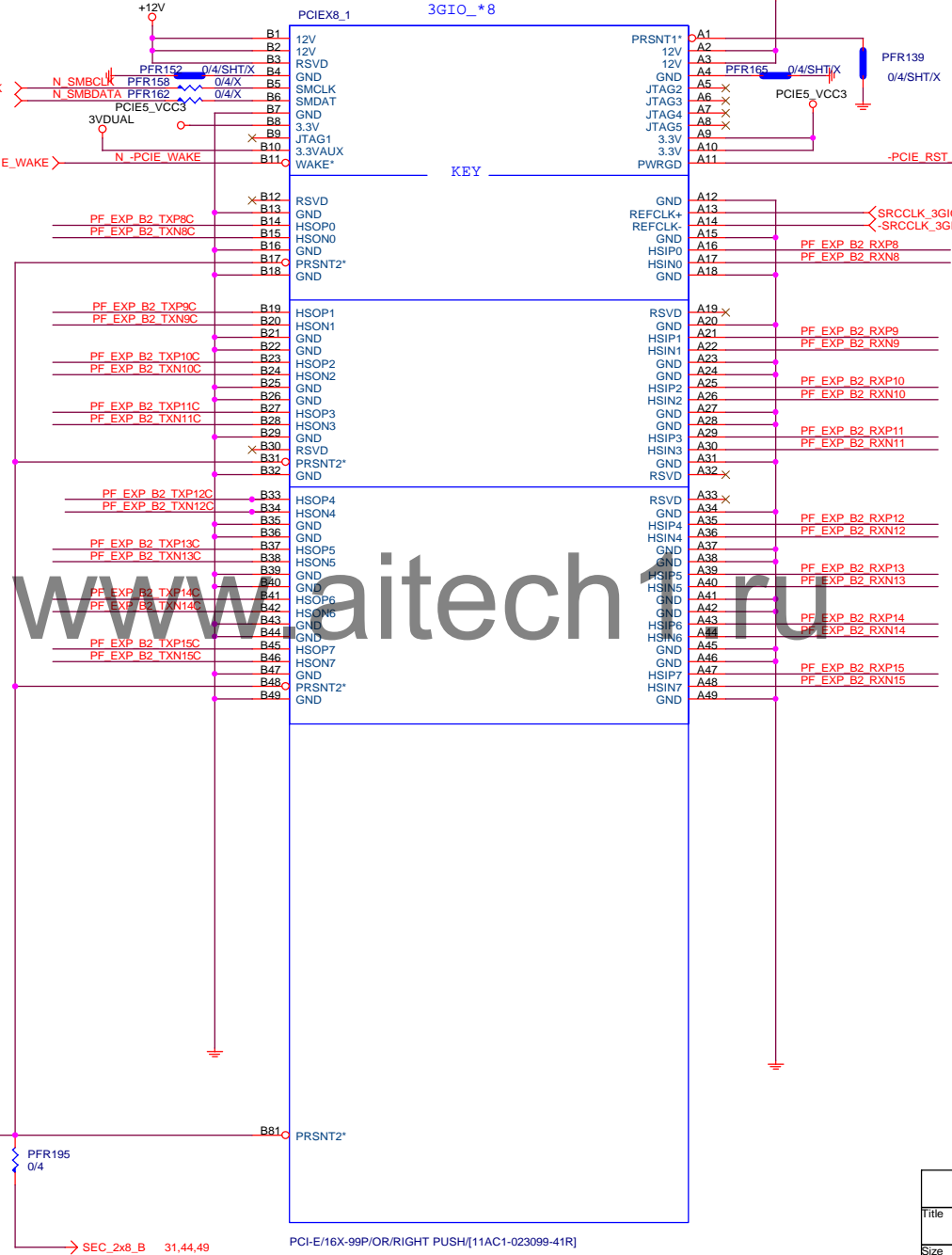
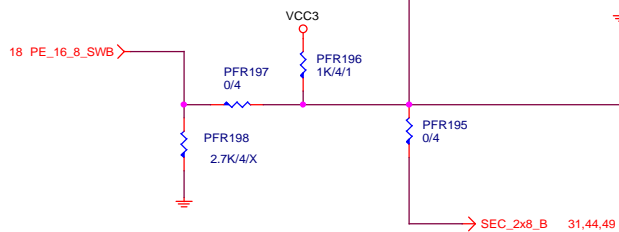
Sheet 18 of 60

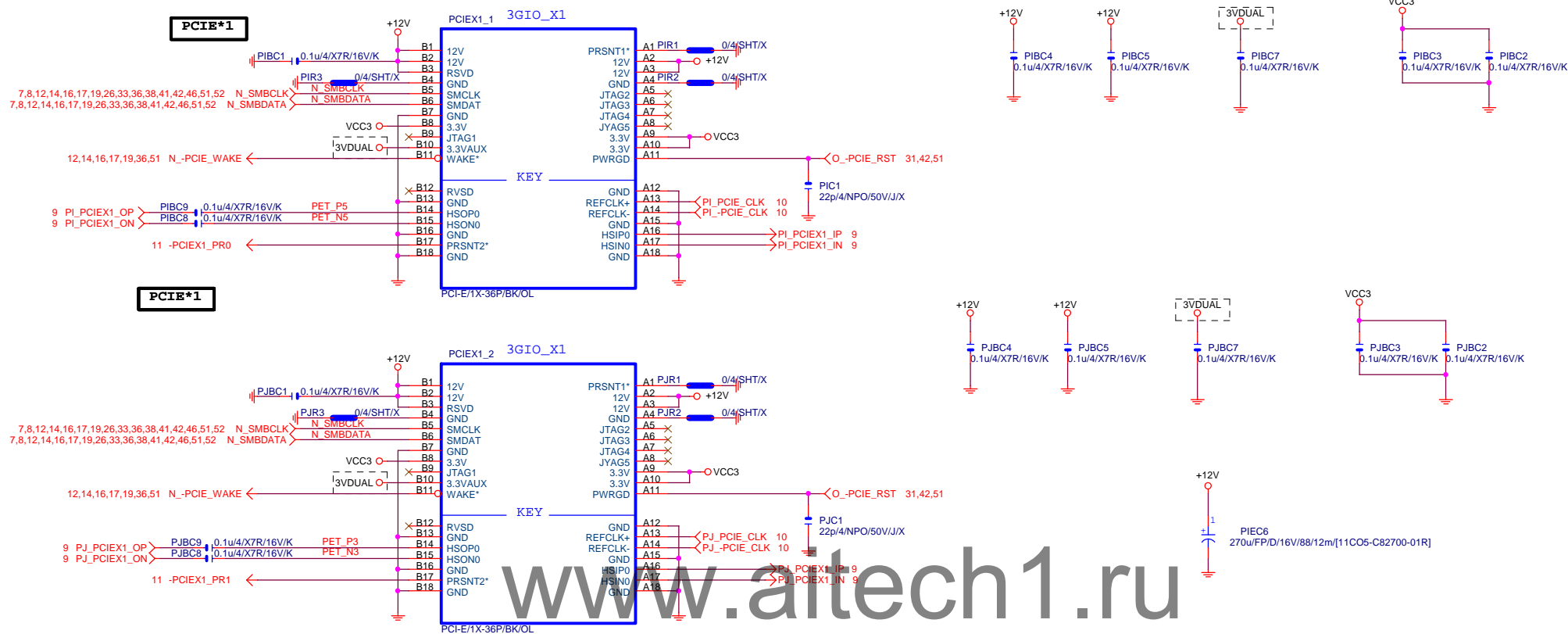
Rev 1.1





|                 |       |                    |                  |
|-----------------|-------|--------------------|------------------|
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| PF_EXP_B2_TXN8  | PFC81 | 0.22u/4/X5R/6.3V/K | PF_EXP_B2_TXN8C  |
| PF_EXP_B2_TXP9  | PFC73 | 0.22u/4/X5R/6.3V/K | PF_EXP_B2_TXP9C  |
| PF_EXP_B2_TXN9  | PFC76 | 0.22u/4/X5R/6.3V/K | PF_EXP_B2_TXN9C  |
| PF_EXP_B2_TXP10 | PFC67 | 0.22u/4/X5R/6.3V/K | PF_EXP_B2_TXP10C |
| PF_EXP_B2_TXN10 | PFC69 | 0.22u/4/X5R/6.3V/K | PF_EXP_B2_TXN10C |
| PF_EXP_B2_TXP11 | PFC61 | 0.22u/4/X5R/6.3V/K | PF_EXP_B2_TXP11C |
| PF_EXP_B2_TXN11 | PFC63 | 0.22u/4/X5R/6.3V/K | PF_EXP_B2_TXN11C |
| PF_EXP_B2_TXP12 | PFC55 | 0.22u/4/X5R/6.3V/K | PF_EXP_B2_TXP12C |
| PF_EXP_B2_TXN12 | PFC57 | 0.22u/4/X5R/6.3V/K | PF_EXP_B2_TXN12C |
| PF_EXP_B2_TXP13 | PFC49 | 0.22u/4/X5R/6.3V/K | PF_EXP_B2_TXP13C |
| PF_EXP_B2_TXN13 | PFC51 | 0.22u/4/X5R/6.3V/K | PF_EXP_B2_TXN13C |
| PF_EXP_B2_TXP14 | PFC42 | 0.22u/4/X5R/6.3V/K | PF_EXP_B2_TXP14C |
| PF_EXP_B2_TXN14 | PFC45 | 0.22u/4/X5R/6.3V/K | PF_EXP_B2_TXN14C |
| PF_EXP_B2_TXP15 | PFC34 | 0.22u/4/X5R/6.3V/K | PF_EXP_B2_TXP15C |
| PF_EXP_B2_TXN15 | PFC36 | 0.22u/4/X5R/6.3V/K | PF_EXP_B2_TXN15C |





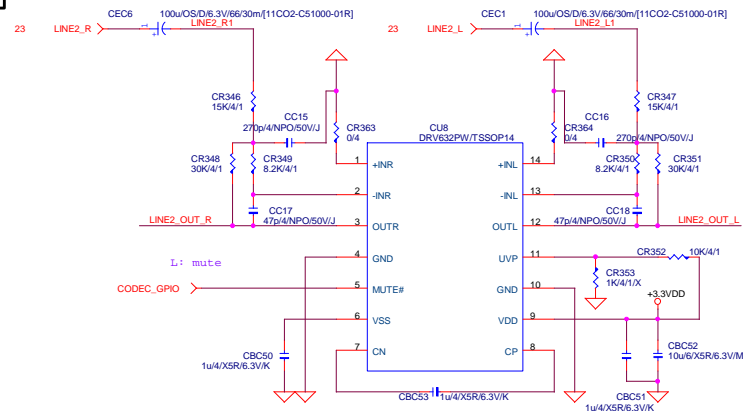




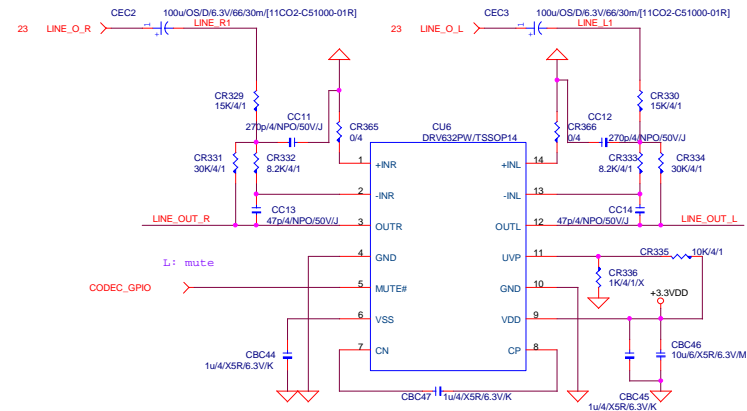




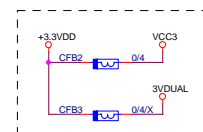
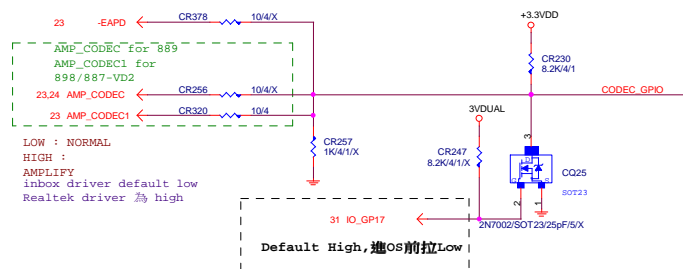
**HEADPHONE**



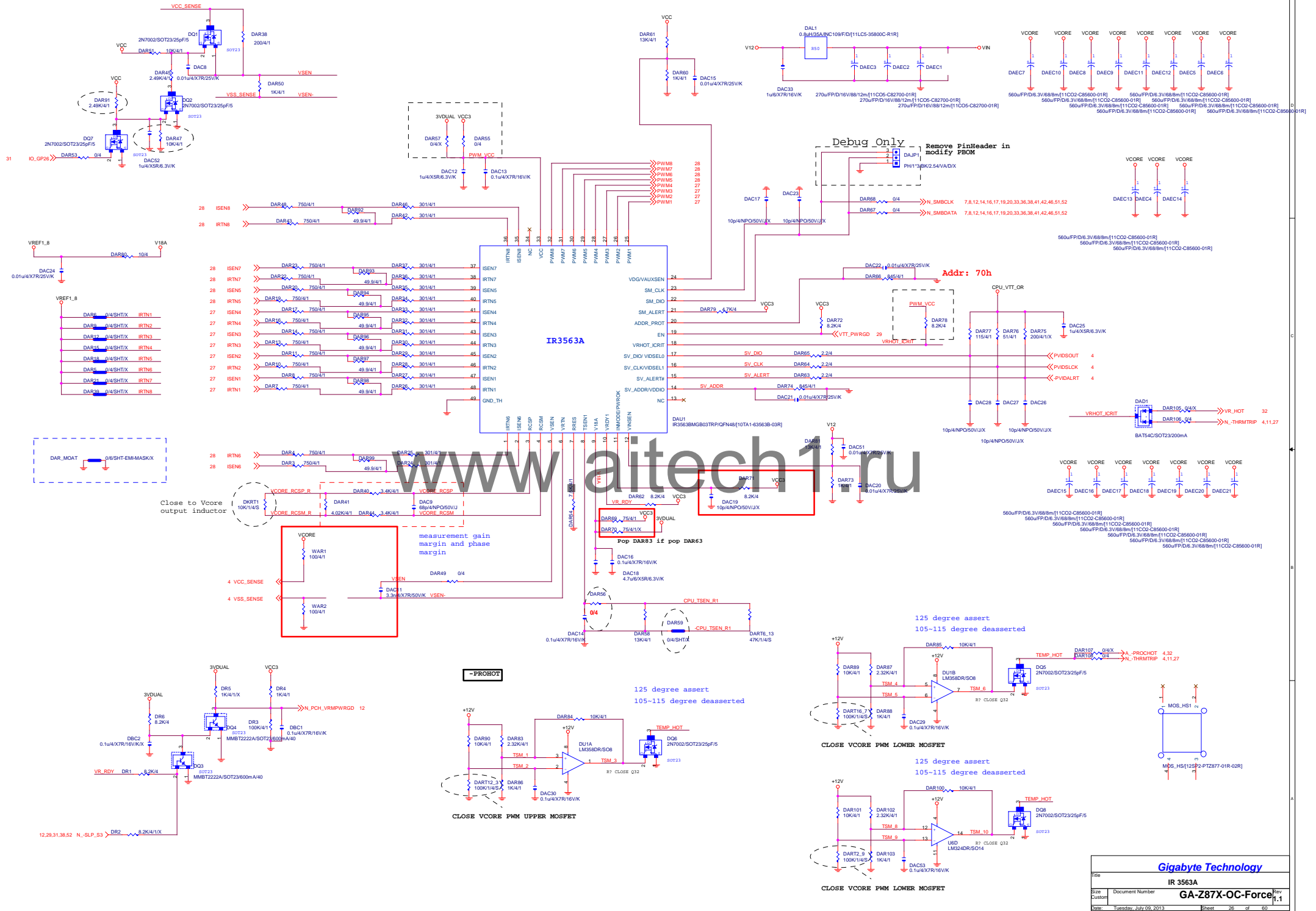
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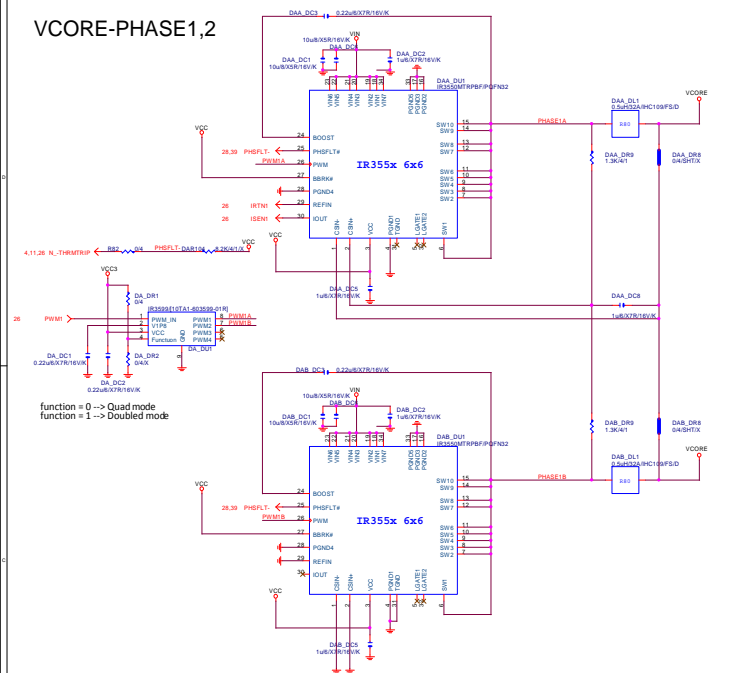
**HEADPHONE**



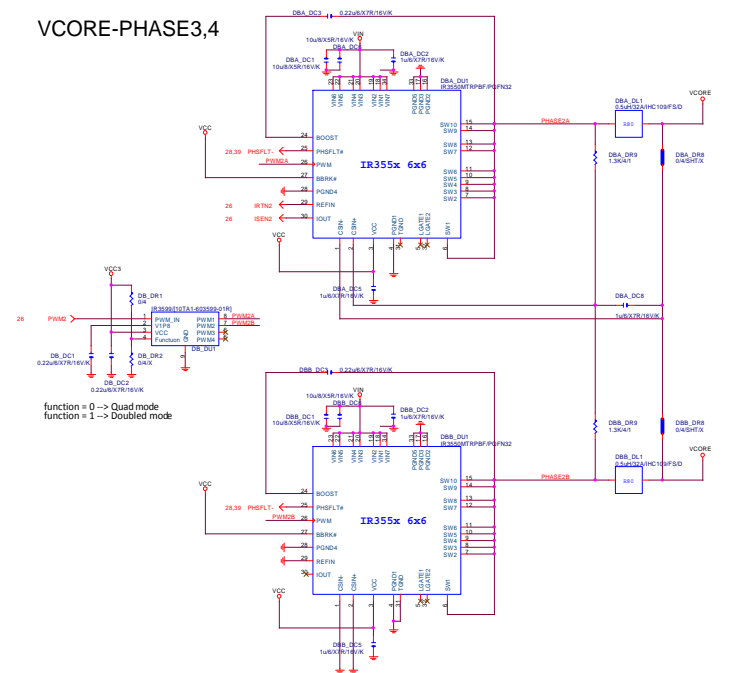




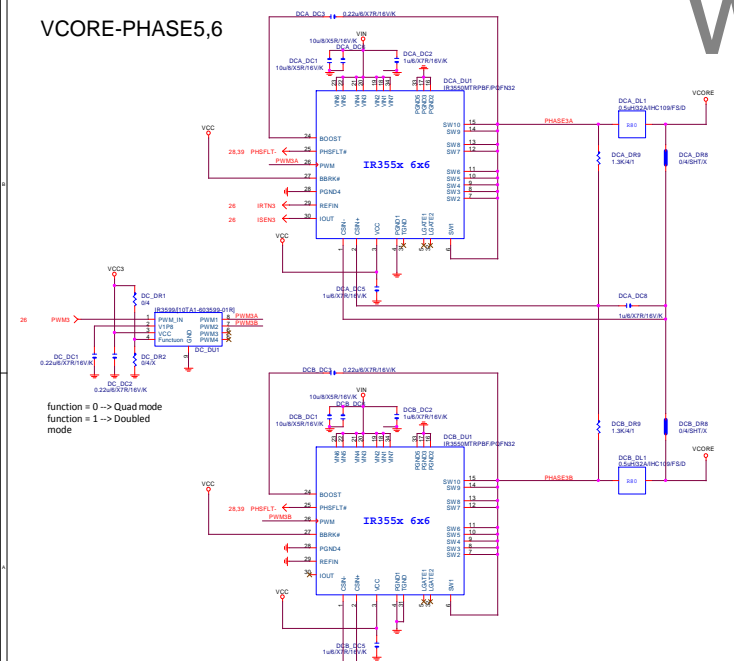
## VCORE-PHASE1,2



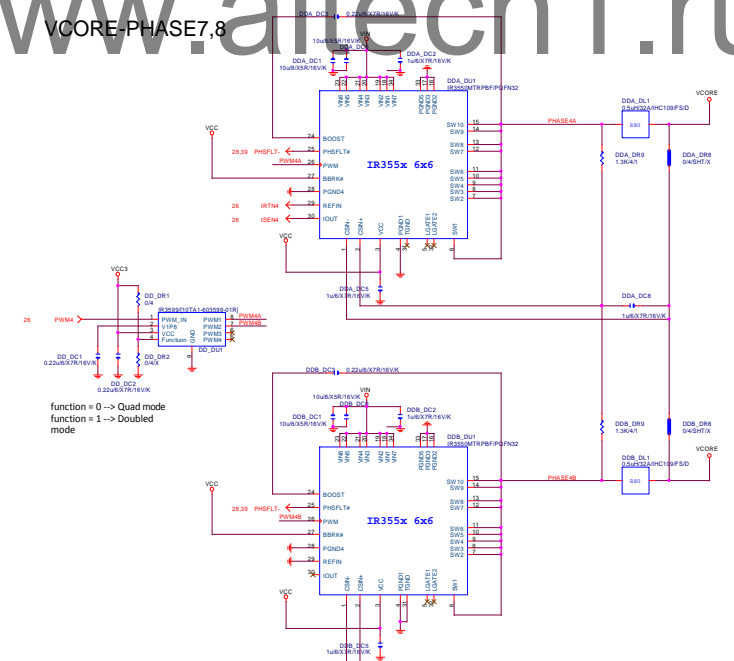
## VCORE-PHASE3,4



## VCORE-PHASE5,6

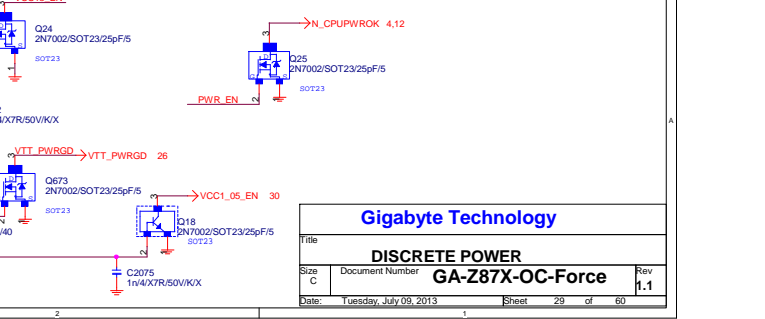
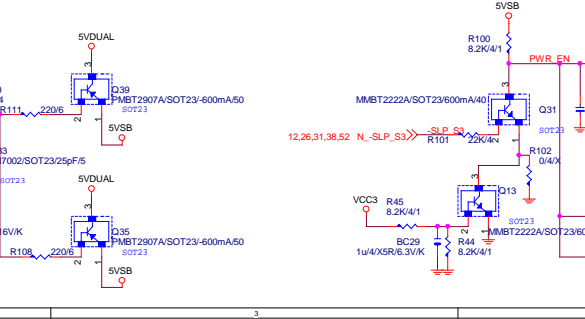
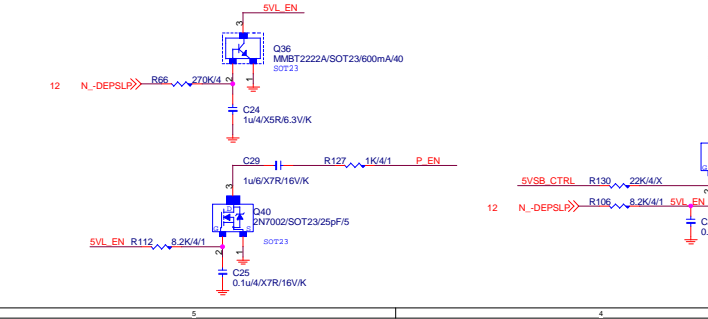
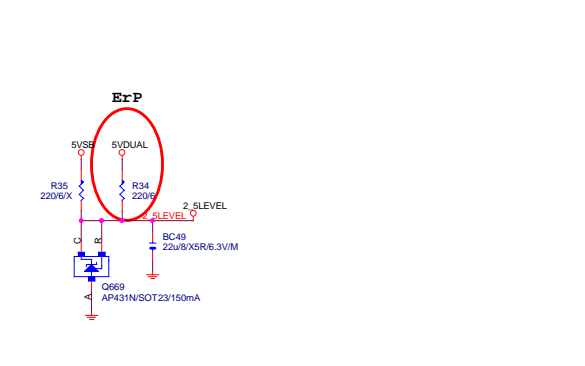
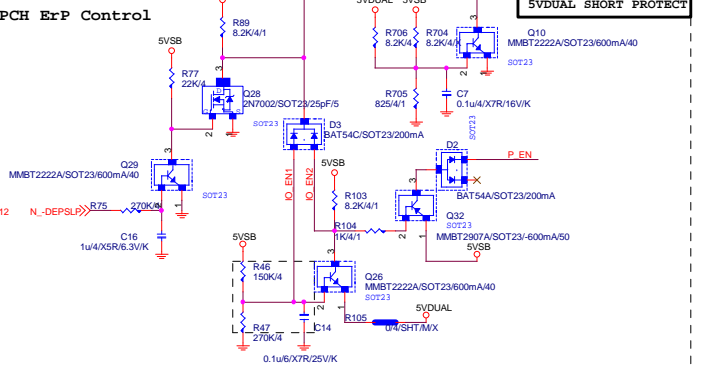
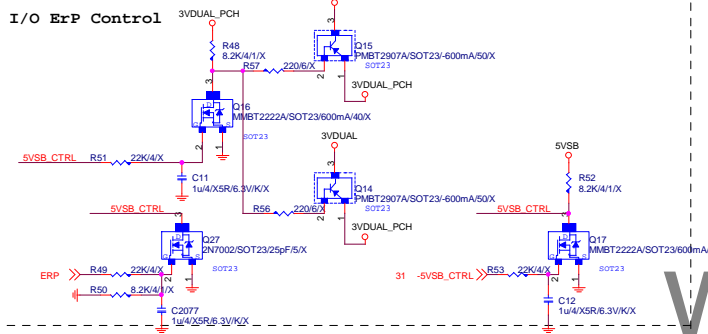
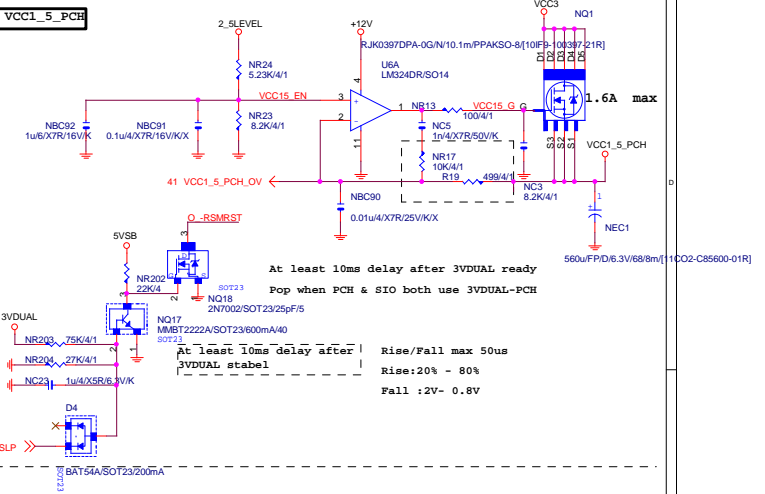
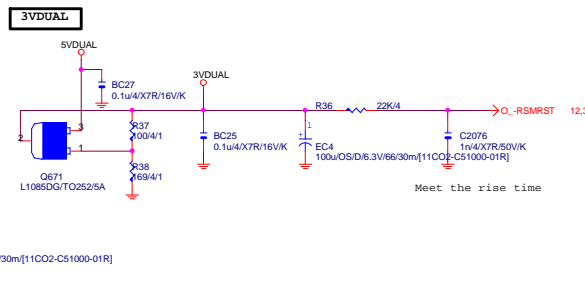
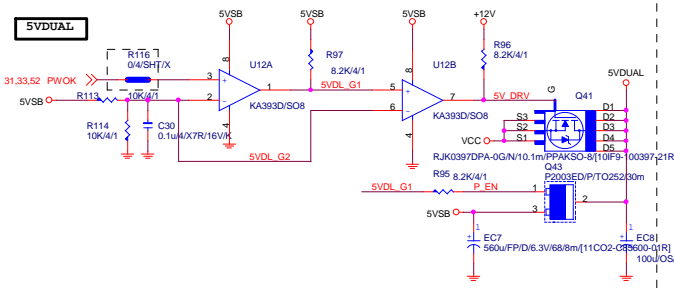


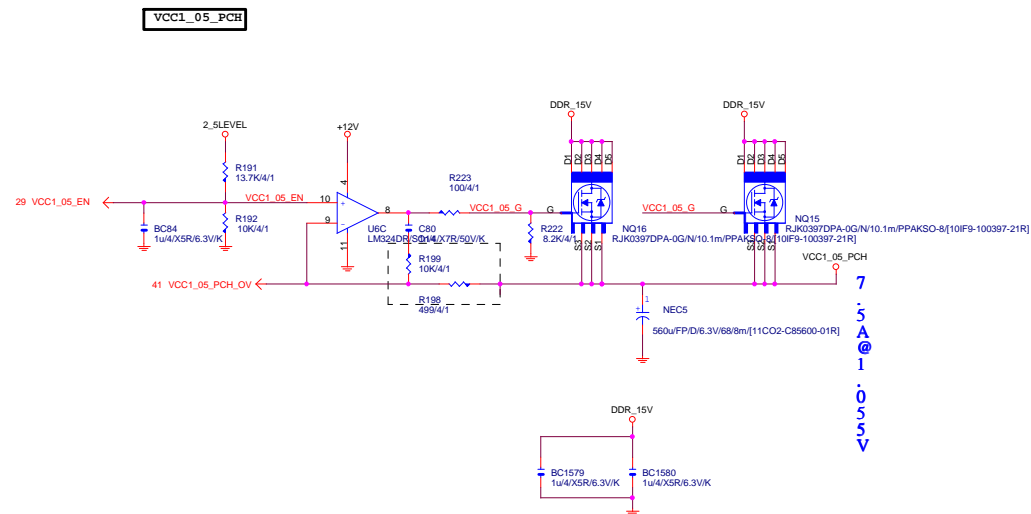
## VCORE-PHASE7,8



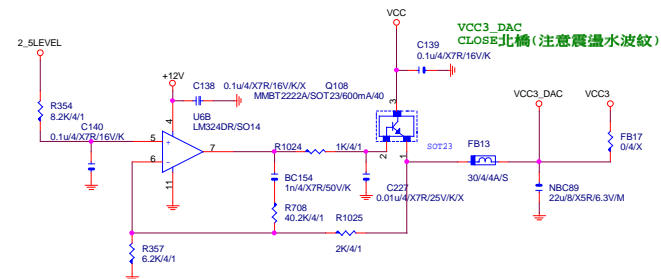
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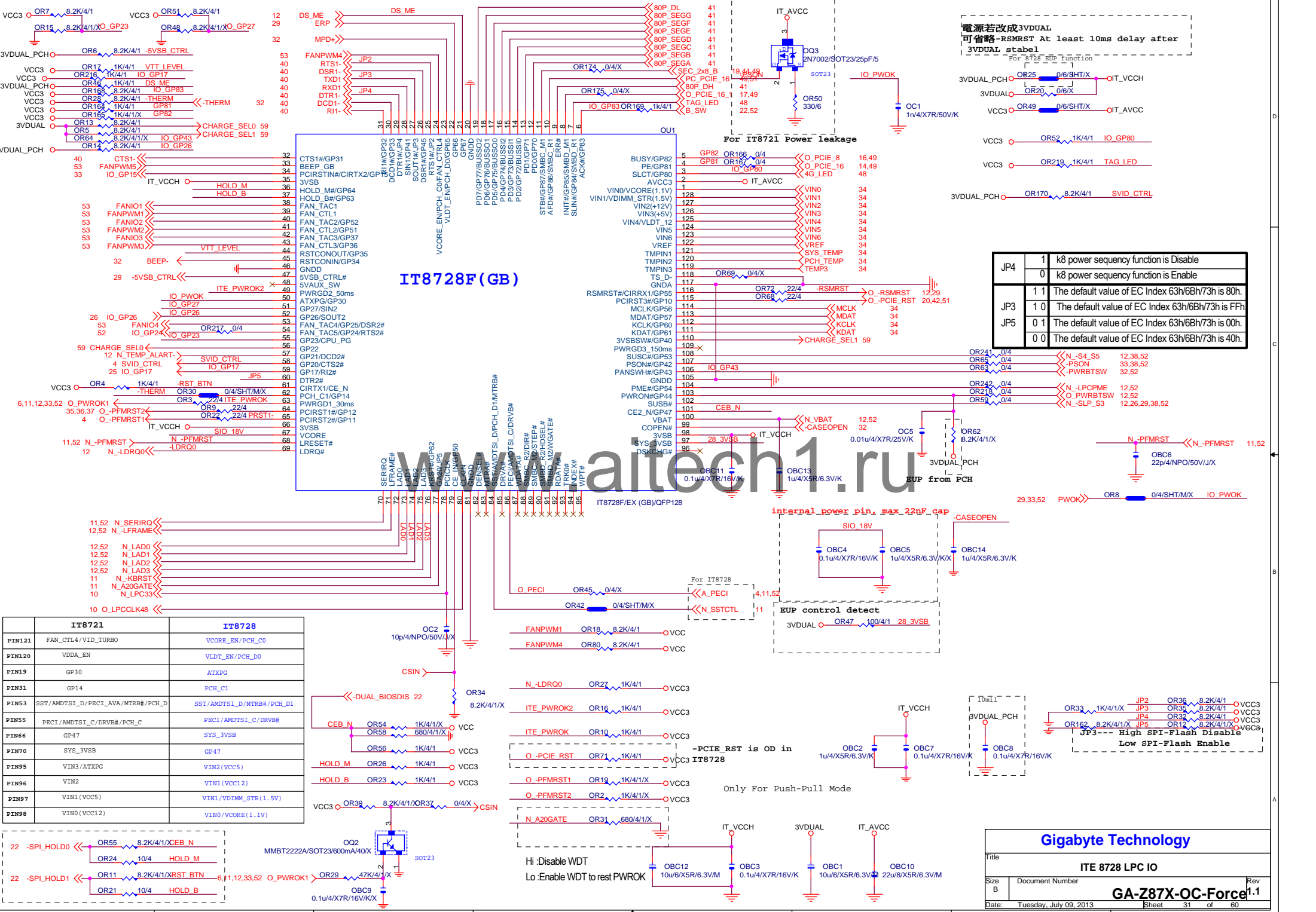




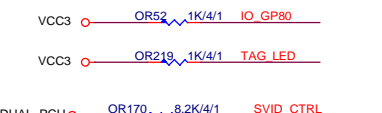
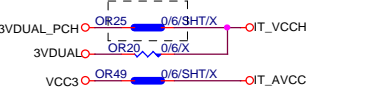
**VCC3\_DAC**  
(3.3V/70mA+360uA)



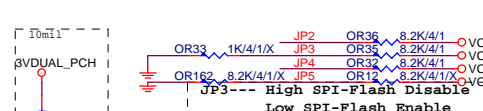
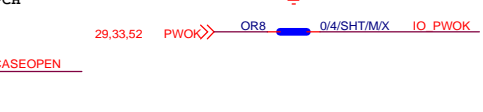
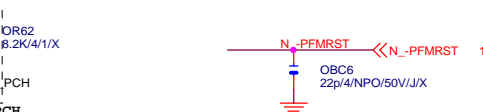
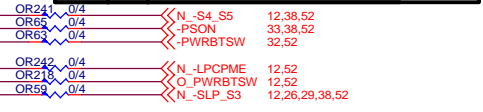
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電源若改成3VDUAL  
可省略-RSMRST At least 10ms delay after  
3VDUAL stabel  
For 8728 EUP Function

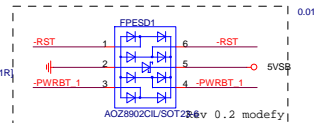
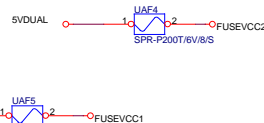
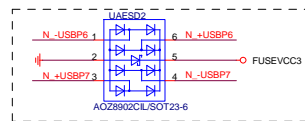
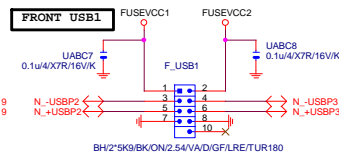
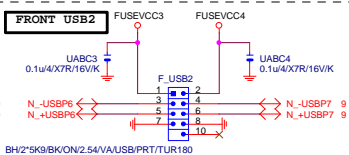


|     |     |   |
|-----|-----|---|
| JP4 | 1   | k8 power sequency function is Disable             |
|     | 0   | k8 power sequency function is Enable              |
| JP3 | 1 1 | The default value of EC Index 63h/6Bh/73h is 80h. |
|     | 1 0 | The default value of EC Index 63h/6Bh/73h is FFh  |
|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

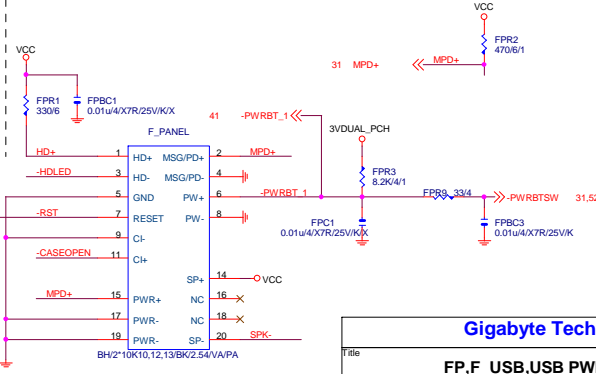
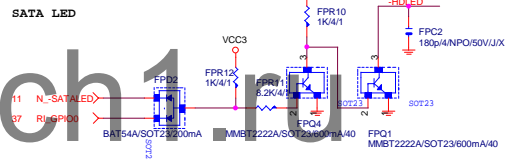
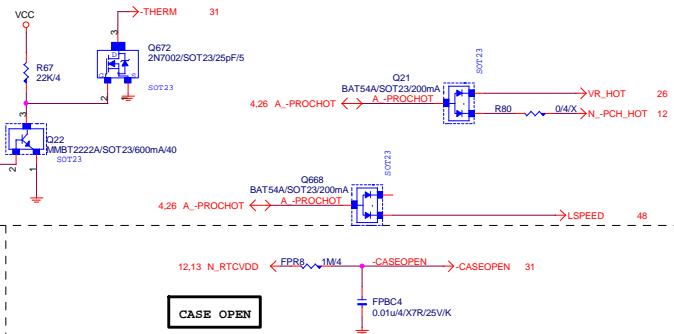


|                     |                        |                  |          |
|---------------------|------------------------|------------------|----------|
| Gigabyte Technology |                        |                  |          |
| Title               |                        |                  |          |
| ITE 8728 LPC IO     |                        |                  |          |
| Size                | Document Number        | Rev              |          |
| B                   |                        | GA-Z87X-OC-Force |          |
| Date:               | Tuesday, July 09, 2013 | Sheet            | 31 of 60 |

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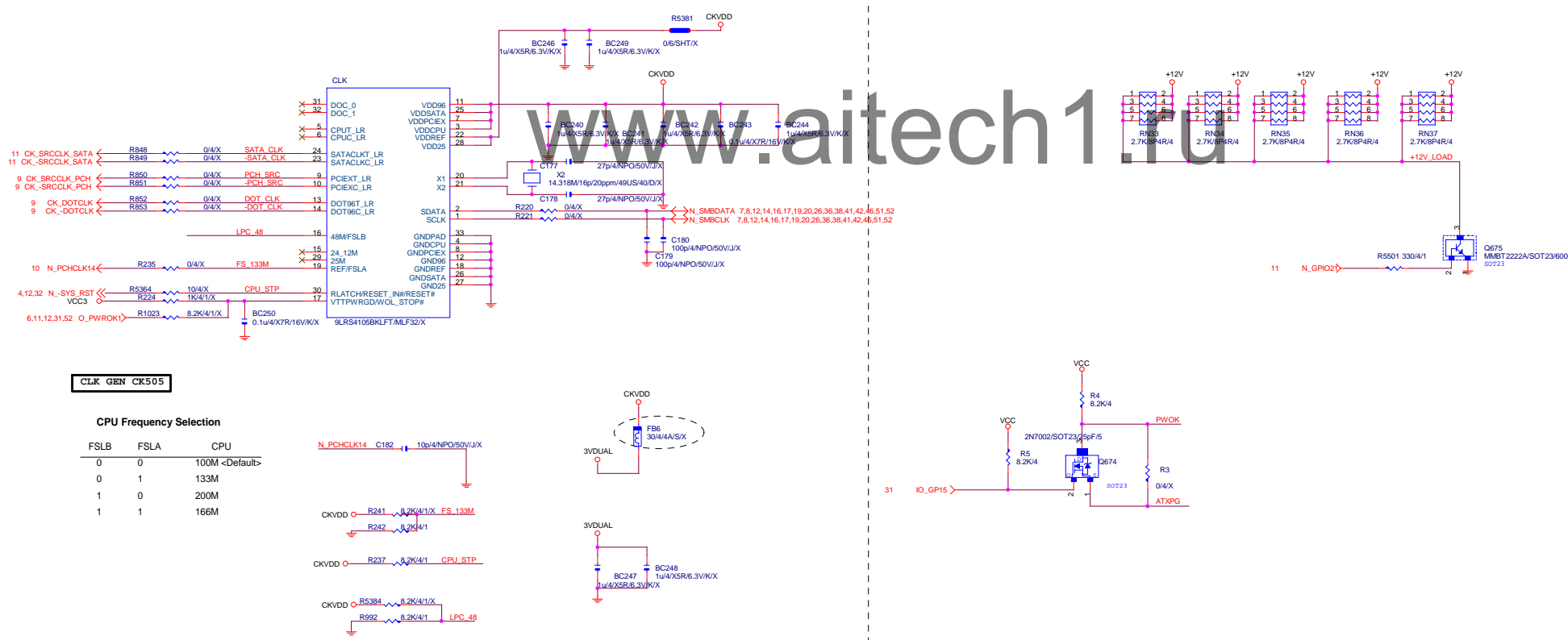
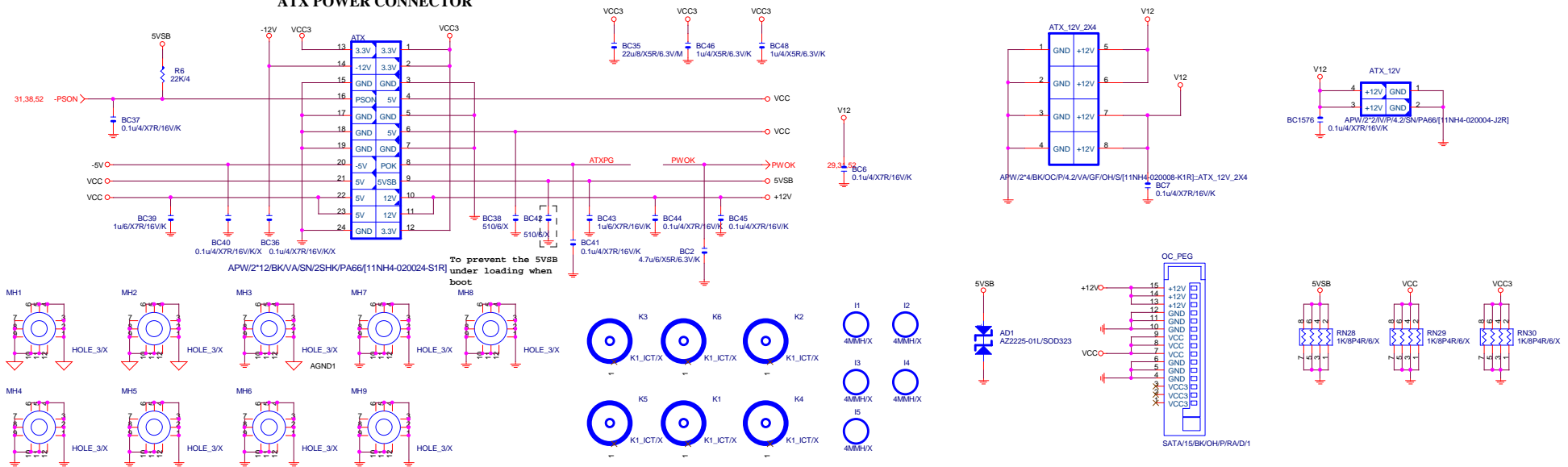


F\_USB POWER PROTECT





# ATX POWER CONNECTOR



CLK GEN CK505

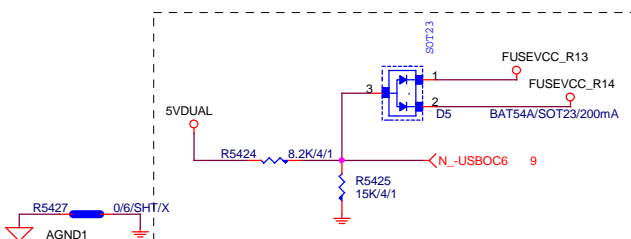
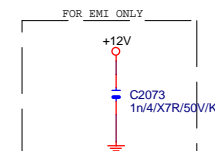
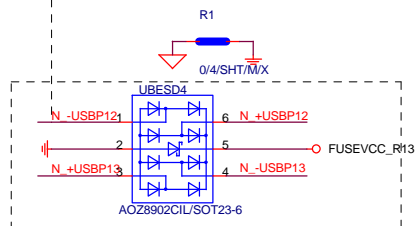
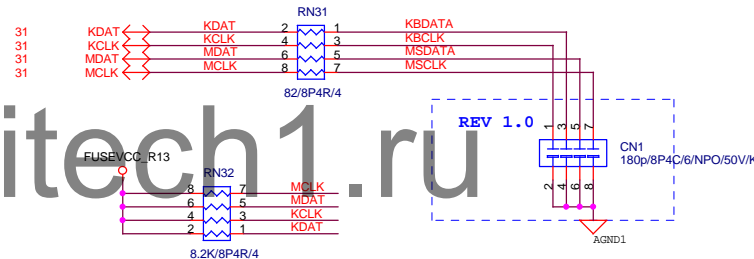
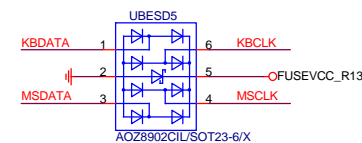
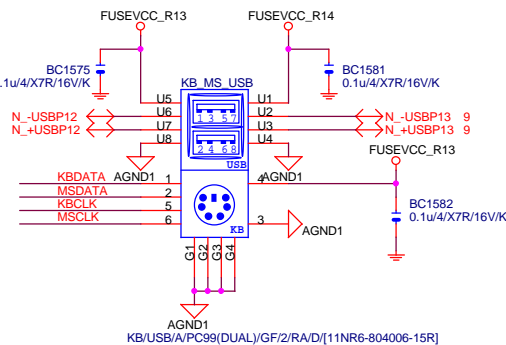
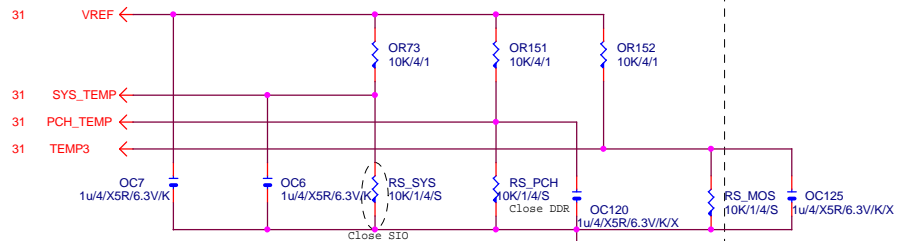
## CPU Frequency Selection

| FSLB | FSLA | CPU            |
|------|------|----------------|
| 0    | 0    | 100M <Default> |
| 0    | 1    | 133M           |
| 1    | 0    | 200M           |
| 1    | 1    | 166M           |

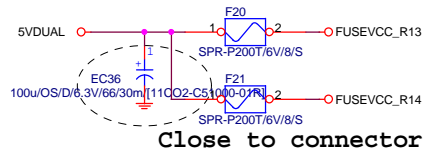
Gigabyte Technology

|                     |                        |                |
|---------------------|------------------------|----------------|
| Title               |                        |                |
| ATX POWER CONNECTOR |                        |                |
| Size                | Document Number        | Rev            |
| C                   | GA-Z87X-OC-Force       | 1.1            |
| Date:               | Tuesday, July 09, 2013 | Sheet 33 of 60 |

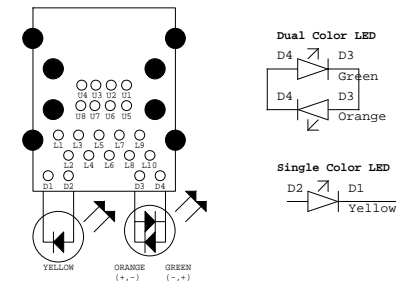
# TEMP H/W MONITOR



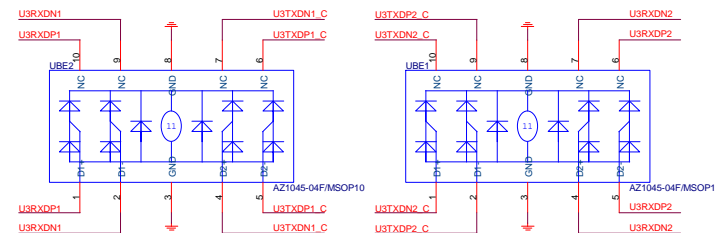
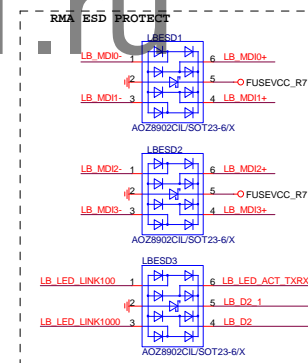
## USB X3 POWER

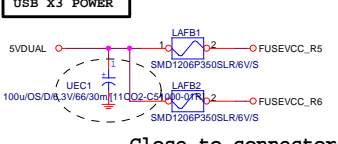
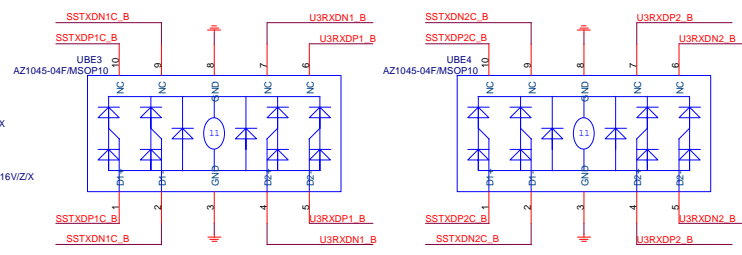
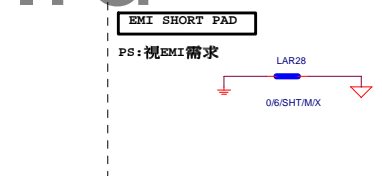
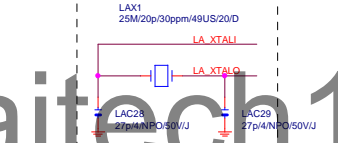
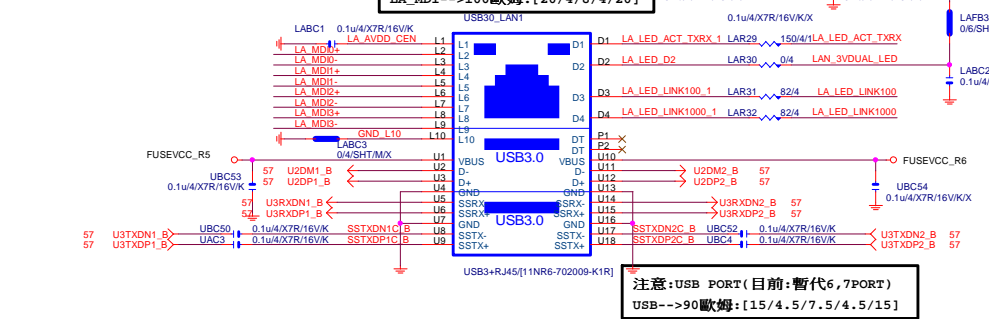
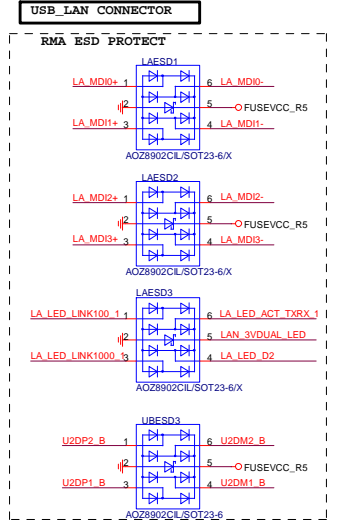
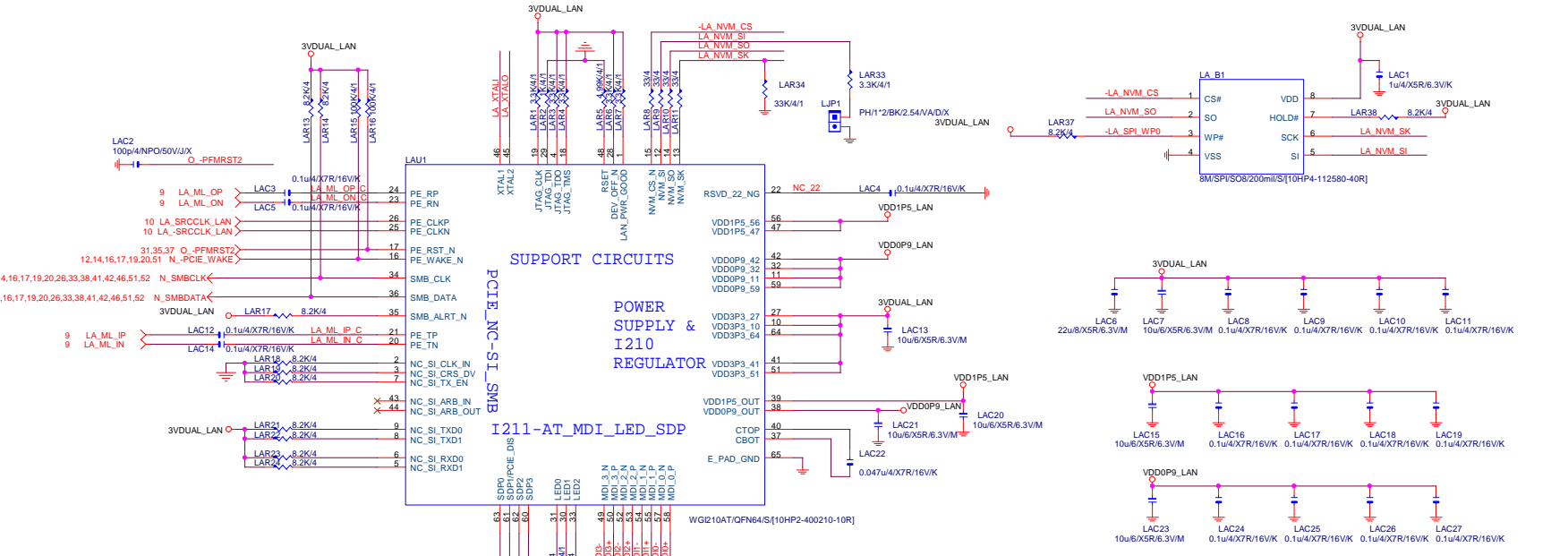


|                              |                                  |         |
|------------------------------|----------------------------------|---------|
| Gigabyte Technology          |                                  |         |
| Title HWM,KB/MS, FAN CTRL    |                                  |         |
| Size Custom                  | Document Number GA-Z87X-OC-Force | Rev 1.1 |
| Date: Tuesday, July 09, 2013 | Sheet 34 of 60                   | 2       |

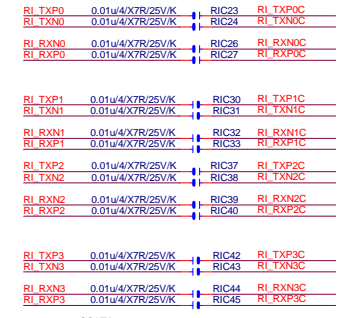
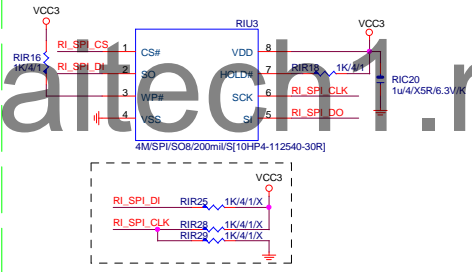
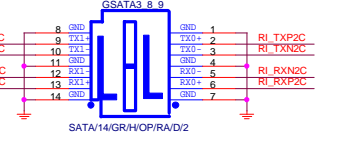
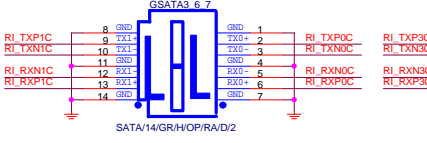
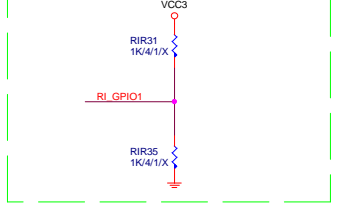
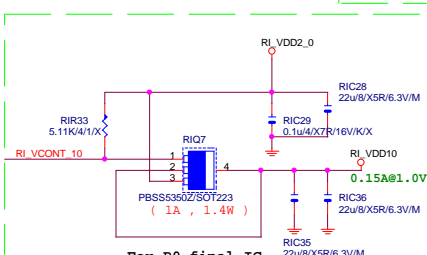
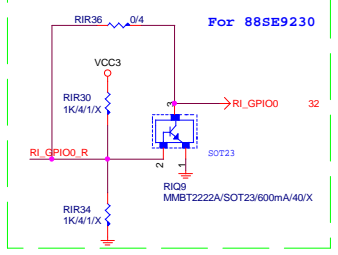
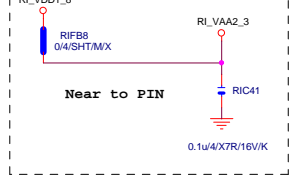
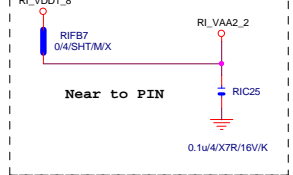
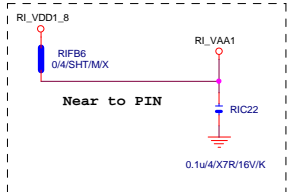
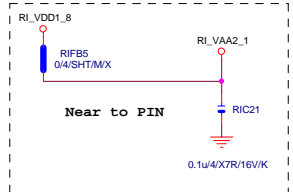
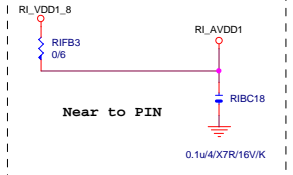
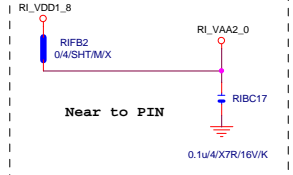
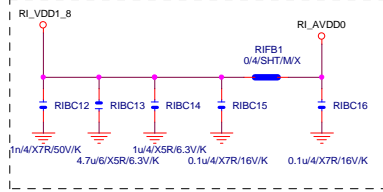
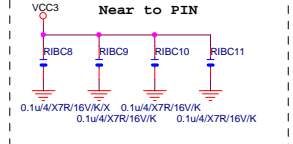
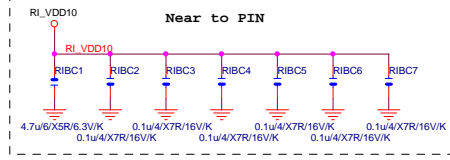


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|--------|----------|
| Access | Blinking |
| Link   | Yellow   |

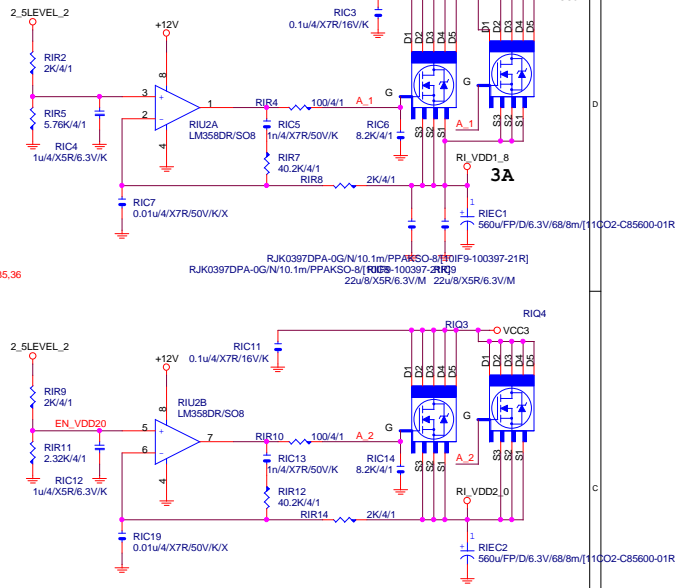


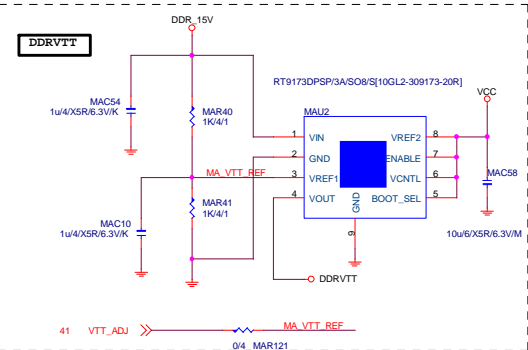
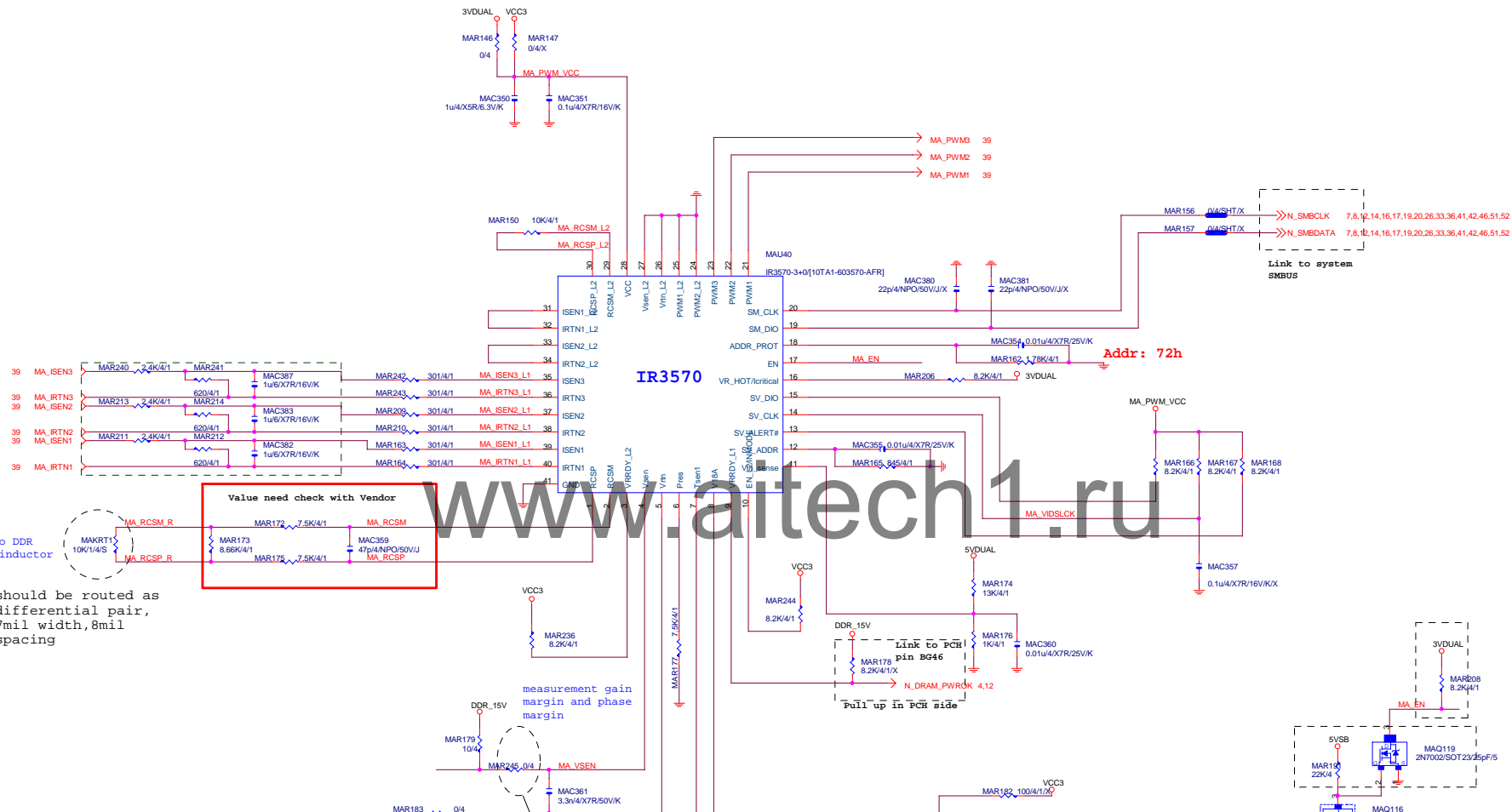
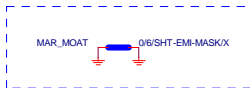


|                     |                        |                |
|---------------------|------------------------|----------------|
| Gigabyte Technology |                        |                |
| INTEL LAN           |                        |                |
| File                | Document Number        | Rev            |
|                     | GA-Z87X-OC-Force       | 1.1            |
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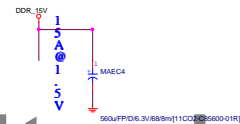
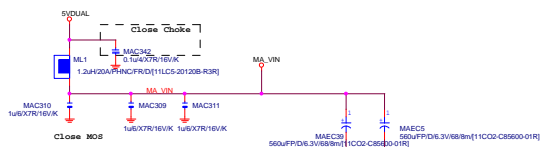
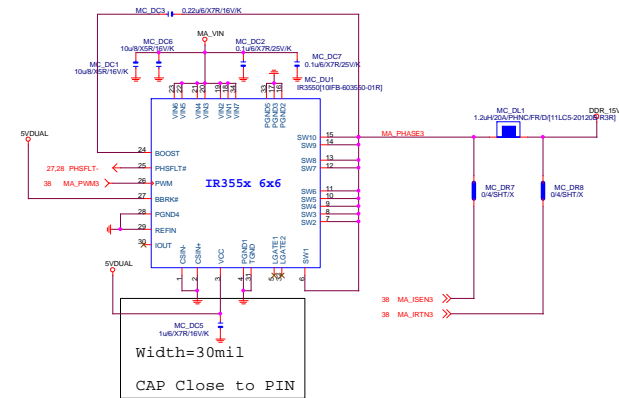
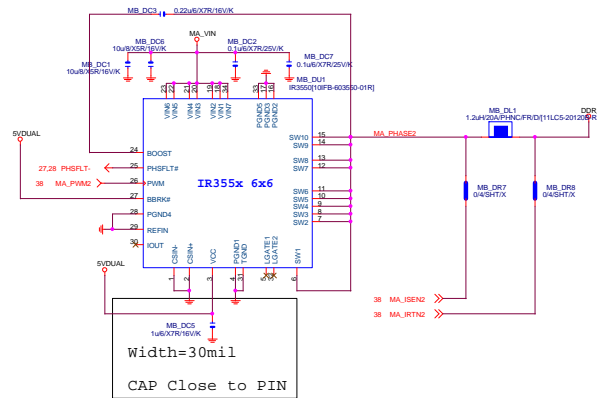
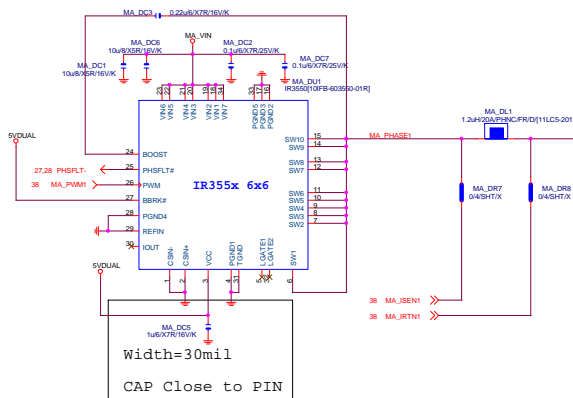


### 3.3V to 1.8V Voltage Regulator



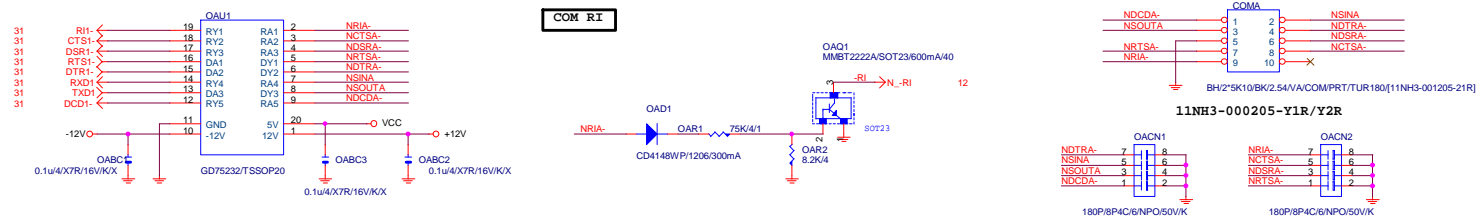


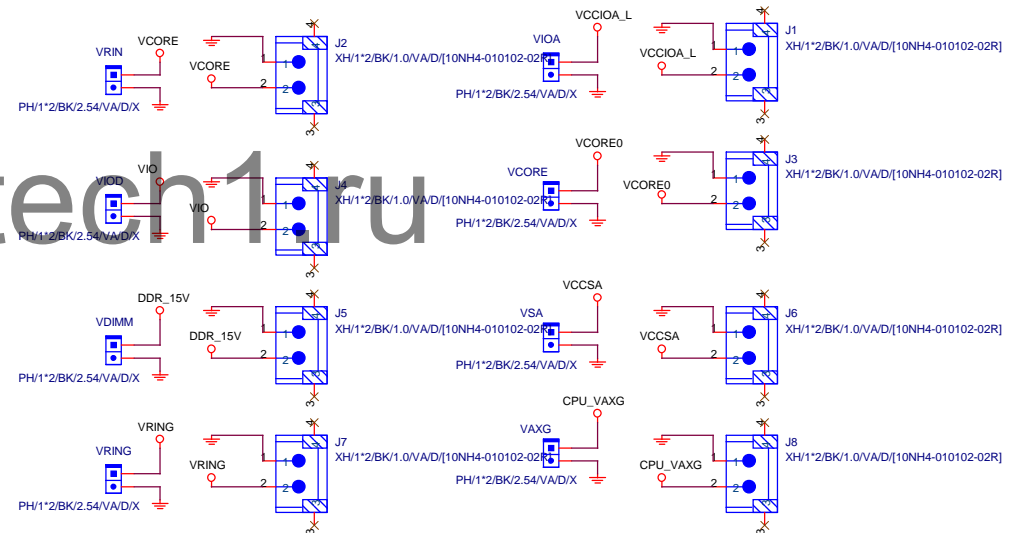
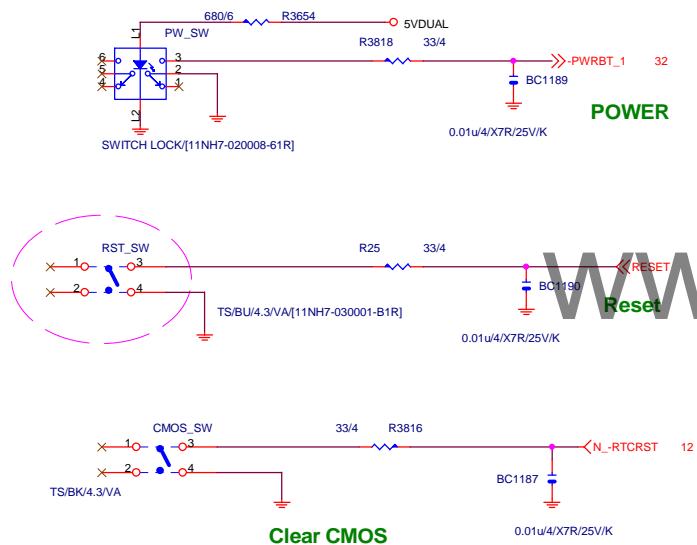
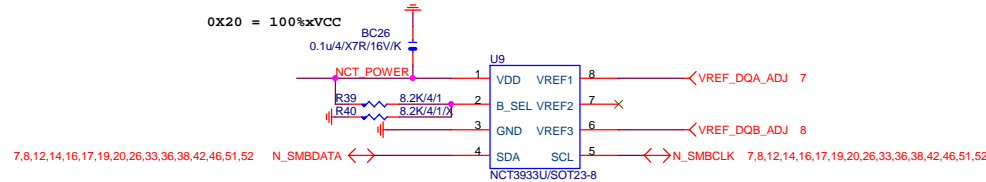
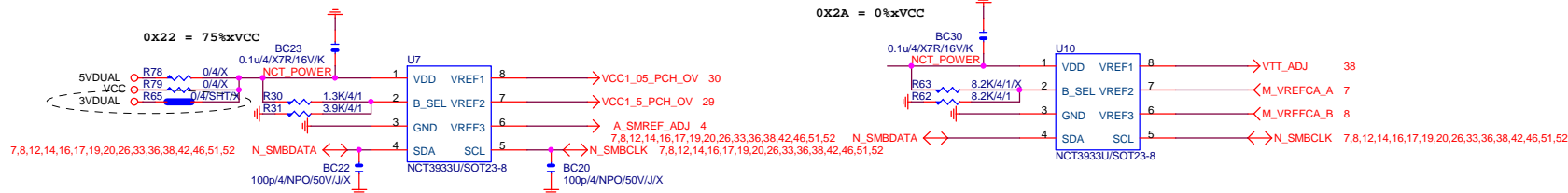
DDR\_15V



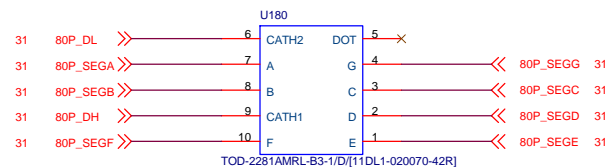
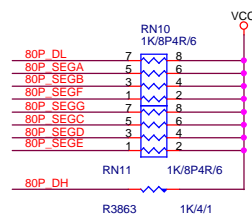
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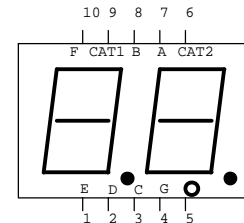


80 PORT



COMMON CATHODE

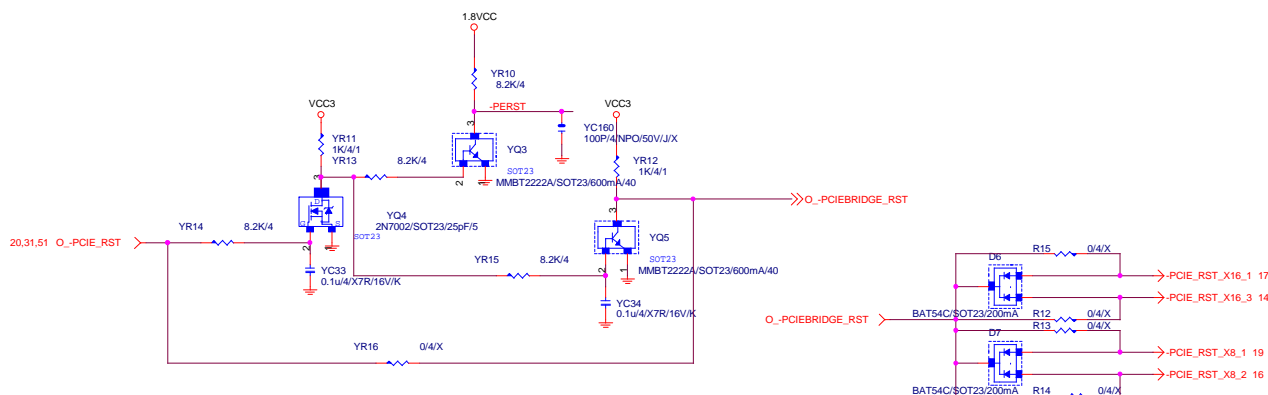
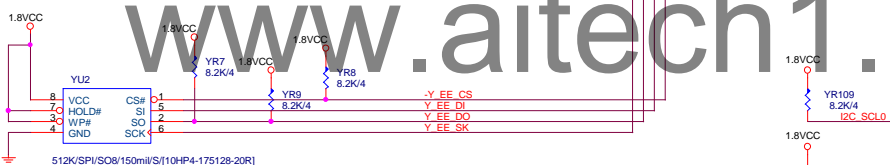
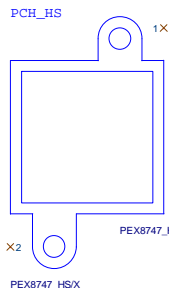
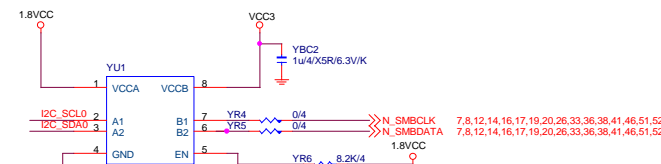
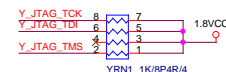
Physical Package (TOP VIEW)



| GIGABYTE™                    |                                  |         |
|------------------------------|----------------------------------|---------|
| Title RST, PWR, CLR_CMOS     |                                  |         |
| Size Custom                  | Document Number GA-Z87X-OC-Force | Rev 1.1 |
| Date: Tuesday, July 09, 2013 | Sheet 41                         | of 60   |

PY\_EXP\_A1\_TXP0\_7I >>> PY\_EXP\_A1\_TXP[0..7] 49  
 PY\_EXP\_A1\_TXN0\_7I >>> PY\_EXP\_A1\_TXN[0..7] 49  
 PY\_EXP\_A1\_RXP0\_7I >>> PY\_EXP\_A1\_RXP[0..7] 49  
 PY\_EXP\_A1\_RXN0\_7I >>> PY\_EXP\_A1\_RXN[0..7] 49  
 PY\_EXP\_A1\_TXP8\_15I >>> PY\_EXP\_A1\_TXP[8..15] 50  
 PY\_EXP\_A1\_TXN8\_15I >>> PY\_EXP\_A1\_TXN[8..15] 50  
 PY\_EXP\_A1\_RXP8\_15I >>> PY\_EXP\_A1\_RXP[8..15] 50  
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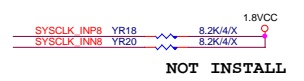
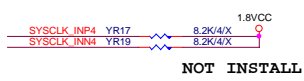
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|-----------------|------|------------|------------|------|-------|------|-------------------|-----------------|--|
| PY_EXP_A1_TXP15 | AD1  | PEX_PERP0  | PEX_PETP0  | AA1  | TX15p | YC1  | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXP15 |  |
| PY_EXP_A1_TXN15 | AE1  | PEX_PERN0  | PEX_PETN0  | AB1  | TX15p | YC2  | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXN15 |  |
| PY_EXP_A1_TXP14 | AD2  | PEX_PERP1  | PEX_PETP1  | AA2  | TX14p | YC4  | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXP14 |  |
| PY_EXP_A1_TXN14 | AE2  | PEX_PERN1  | PEX_PETN1  | AB2  | TX14p | YC4  | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXN14 |  |
| PY_EXP_A1_TXP13 | AD3  | PEX_PERP2  | PEX_PETP2  | AA3  | TX13p | YC5  | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXP13 |  |
| PY_EXP_A1_TXN13 | AE3  | PEX_PERN2  | PEX_PETN2  | AB3  | TX13p | YC6  | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXN13 |  |
| PY_EXP_A1_TXP12 | AD5  | PEX_PERP3  | PEX_PETP3  | AA5  | TX12p | YC7  | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXP12 |  |
| PY_EXP_A1_TXN12 | AE5  | PEX_PERN3  | PEX_PETN3  | AB5  | TX12p | YC8  | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXN12 |  |
| PY_EXP_A1_TXP11 | AD7  | PEX_PERP4  | PEX_PETP4  | AA7  | TX11p | YC9  | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXP11 |  |
| PY_EXP_A1_TXN11 | AE7  | PEX_PERN4  | PEX_PETN4  | AB7  | TX11p | YC10 | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXN11 |  |
| PY_EXP_A1_TXP10 | AD8  | PEX_PERP5  | PEX_PETP5  | AA8  | TX10p | YC11 | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXP10 |  |
| PY_EXP_A1_TXN10 | AE8  | PEX_PERN5  | PEX_PETN5  | AB8  | TX10p | YC12 | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXN10 |  |
| PY_EXP_A1_TXP9  | AD10 | PEX_PERP6  | PEX_PETP6  | AA10 | TX9p  | YC13 | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXP9  |  |
| PY_EXP_A1_TXN9  | AE10 | PEX_PERN6  | PEX_PETN6  | AB10 | TX9p  | YC14 | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXN9  |  |
| PY_EXP_A1_TXP8  | AD11 | PEX_PERP7  | PEX_PETP7  | AA11 | TX8p  | YC15 | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXP8  |  |
| PY_EXP_A1_TXN8  | AE11 | PEX_PERN7  | PEX_PETN7  | AB11 | TX8p  | YC16 | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXN8  |  |
| PY_EXP_A1_TXP7  | AD13 | PEX_PERP8  | PEX_PETP8  | AA13 | TX7p  | YC17 | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXP7  |  |
| PY_EXP_A1_TXN7  | AE13 | PEX_PERN8  | PEX_PETN8  | AB13 | TX7p  | YC18 | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXN7  |  |
| PY_EXP_A1_TXP6  | AD14 | PEX_PERP9  | PEX_PETP9  | AA14 | TX6p  | YC19 | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXP6  |  |
| PY_EXP_A1_TXN6  | AE14 | PEX_PERN9  | PEX_PETN9  | AB14 | TX6p  | YC20 | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXN6  |  |
| PY_EXP_A1_TXP5  | AD16 | PEX_PERP10 | PEX_PETP10 | AA16 | TX5p  | YC21 | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXP5  |  |
| PY_EXP_A1_TXN5  | AE16 | PEX_PERN10 | PEX_PETN10 | AB16 | TX5p  | YC22 | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXN5  |  |
| PY_EXP_A1_TXP4  | AD17 | PEX_PERP11 | PEX_PETP11 | AA17 | TX4p  | YC23 | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXP4  |  |
| PY_EXP_A1_TXN4  | AE17 | PEX_PERN11 | PEX_PETN11 | AB17 | TX4p  | YC24 | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXN4  |  |
| PY_EXP_A1_TXP3  | AD19 | PEX_PERP12 | PEX_PETP12 | AA19 | TX3p  | YC25 | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXP3  |  |
| PY_EXP_A1_TXN3  | AE19 | PEX_PERN12 | PEX_PETN12 | AB19 | TX3p  | YC26 | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXN3  |  |
| PY_EXP_A1_TXP2  | AD20 | PEX_PERP13 | PEX_PETP13 | AA20 | TX2p  | YC27 | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXP2  |  |
| PY_EXP_A1_TXN2  | AE20 | PEX_PERN13 | PEX_PETN13 | AB20 | TX2p  | YC28 | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXN2  |  |
| PY_EXP_A1_TXP1  | AD22 | PEX_PERP14 | PEX_PETP14 | AA22 | TX1p  | YC29 | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXP1  |  |
| PY_EXP_A1_TXN1  | AE22 | PEX_PERN14 | PEX_PETN14 | AB22 | TX1p  | YC30 | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXN1  |  |
| PY_EXP_A1_TXP0  | AD23 | PEX_PERP15 | PEX_PETP15 | AA23 | TX0p  | YC31 | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXP0  |  |
| PY_EXP_A1_TXN0  | AE23 | PEX_PERN15 | PEX_PETN15 | AB23 | TX0p  | YC32 | 0.22u/4/X5R6.3V/K | PY_EXP_A1_RXN0  |  |



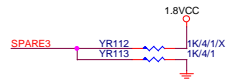
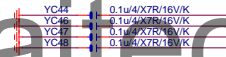
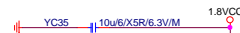
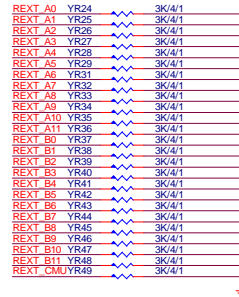
|                |     |            |     |
|----------------|-----|------------|-----|
| USB            |     |            |     |
| PA EXP A RXP0  | V4  | PEX_PETP16 | V2  |
| PA EXP A RXN0  | V5  | PEX_PERN16 | V1  |
| PA EXP A RXP1  | U4  | PEX_PETP17 | U2  |
| PA EXP A RXN1  | U5  | PEX_PETP17 | U1  |
| PA EXP A RXP2  | R5  | PEX_PETN17 | R2  |
| PA EXP A RXN2  | R4  | PEX_PETN18 | R1  |
| PA EXP A RXP3  | P5  | PEX_PETN18 | P2  |
| PA EXP A RXN3  | P4  | PEX_PETP19 | P1  |
| PA EXP A RXP4  | M5  | PEX_PETN19 | M2  |
| PA EXP A RXN4  | M4  | PEX_PETP20 | M1  |
| PA EXP A RXP5  | L5  | PEX_PETN20 | L2  |
| PA EXP A RXN5  | L4  | PEX_PETP21 | L1  |
| PA EXP A RXP6  | J5  | PEX_PETN21 | J2  |
| PA EXP A RXN6  | J4  | PEX_PETP22 | J1  |
| PA EXP A RXP7  | H5  | PEX_PETP23 | H2  |
| PA EXP A RXN7  | H4  | PEX_PETN23 | H1  |
| PA EXP A RXP8  | D1  | PEX_PETP24 | A1  |
| PA EXP A RXN8  | D2  | PEX_PETN24 | A2  |
| PA EXP A RXP9  | D3  | PEX_PETP25 | B2  |
| PA EXP A RXN9  | D4  | PEX_PETN25 | B1  |
| PA EXP A RXP10 | E4  | PEX_PETP26 | A4  |
| PA EXP A RXN10 | E5  | PEX_PETN26 | A5  |
| PA EXP A RXP11 | D6  | PEX_PETP27 | A6  |
| PA EXP A RXN11 | D7  | PEX_PETN27 | A7  |
| PA EXP A RXP12 | E7  | PEX_PETP28 | B7  |
| PA EXP A RXN12 | D7  | PEX_PETN28 | B8  |
| PA EXP A RXP13 | E8  | PEX_PETP29 | A8  |
| PA EXP A RXN13 | D8  | PEX_PETN29 | A9  |
| PA EXP A RXP14 | E10 | PEX_PETP30 | B10 |
| PA EXP A RXN14 | D10 | PEX_PETN30 | A10 |
| PA EXP A RXP15 | E11 | PEX_PETP31 | B11 |
| PA EXP A RXN15 | D11 | PEX_PETN31 | A11 |
| PB EXP B RXP0  | V19 | PEX_PETP32 | V22 |
| PB EXP B RXN0  | V20 | PEX_PETN32 | V23 |
| PB EXP B RXP1  | U19 | PEX_PETP33 | U22 |
| PB EXP B RXN1  | U20 | PEX_PETN33 | U23 |
| PB EXP B RXP2  | R19 | PEX_PETP34 | R22 |
| PB EXP B RXN2  | R20 | PEX_PETN34 | R23 |
| PB EXP B RXP3  | P19 | PEX_PETP35 | P22 |
| PB EXP B RXN3  | P20 | PEX_PETN35 | P23 |
| PB EXP B RXP4  | M19 | PEX_PETP36 | M22 |
| PB EXP B RXN4  | M20 | PEX_PETN36 | M23 |
| PB EXP B RXP5  | L19 | PEX_PETP37 | L22 |
| PB EXP B RXN5  | L20 | PEX_PETN37 | L23 |
| PB EXP B RXP6  | J19 | PEX_PETP38 | J22 |
| PB EXP B RXN6  | J20 | PEX_PETN38 | J23 |
| PB EXP B RXP7  | H19 | PEX_PETP39 | H22 |
| PB EXP B RXN7  | H20 | PEX_PETN39 | H23 |
| PB EXP B RXP8  | E23 | PEX_PETP40 | B23 |
| PB EXP B RXN8  | D23 | PEX_PETN40 | A23 |
| PB EXP B RXP9  | E22 | PEX_PETP41 | B22 |
| PB EXP B RXN9  | D22 | PEX_PETN41 | A22 |
| PB EXP B RXP10 | E20 | PEX_PETP42 | B20 |
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| PB EXP B RXP11 | E19 | PEX_PETP43 | B19 |
| PB EXP B RXN11 | D19 | PEX_PETN43 | A19 |
| PB EXP B RXP12 | E17 | PEX_PETP44 | B17 |
| PB EXP B RXN12 | D17 | PEX_PETN44 | A17 |
| PB EXP B RXP13 | E16 | PEX_PETP45 | B16 |
| PB EXP B RXN13 | D16 | PEX_PETN45 | A16 |
| PB EXP B RXP14 | E14 | PEX_PETP46 | B14 |
| PB EXP B RXN14 | D14 | PEX_PETN46 | A14 |
| PB EXP B RXP15 | E13 | PEX_PETP47 | B13 |
| PB EXP B RXN15 | D13 | PEX_PETN47 | A13 |

SYSCLK\_INP4 P7  
 SYSCLK\_INN4 P6  
 PEX\_REFCLK\_SSCP4  
 PEX\_REFCLK\_SSCN4  
 PEX\_REFCLK\_SSCP8  
 PEX\_REFCLK\_SSCN8

P17 SYSCLK\_INP8  
 P18 SYSCLK\_INN8



- PA EXP A RXP0..71 >>> PA\_EXP\_A\_RXP[0..7] 15
- PA EXP A RXN0..71 >>> PA\_EXP\_A\_RXN[0..7] 15
- PA EXP A TXP0..71 >>> PA\_EXP\_A\_TXP[0..7] 15
- PA EXP A TXN0..71 >>> PA\_EXP\_A\_TXN[0..7] 15
- PA EXP A RXP[8..15] >>> PA\_EXP\_A\_RXP[8..15] 14
- PA EXP A RXN[8..15] >>> PA\_EXP\_A\_RXN[8..15] 14
- PA EXP A TXP[8..15] >>> PA\_EXP\_A\_TXP[8..15] 14
- PA EXP A TXN[8..15] >>> PA\_EXP\_A\_TXN[8..15] 14
- PB EXP B RXP0..71 >>> PB\_EXP\_B\_RXP[0..7] 17
- PB EXP B RXN0..71 >>> PB\_EXP\_B\_RXN[0..7] 17
- PB EXP B TXP0..71 >>> PB\_EXP\_B\_TXP[0..7] 17
- PB EXP B TXN0..71 >>> PB\_EXP\_B\_TXN[0..7] 17
- PB EXP B RXP[8..15] >>> PB\_EXP\_B\_RXP[8..15] 18
- PB EXP B RXN[8..15] >>> PB\_EXP\_B\_RXN[8..15] 18
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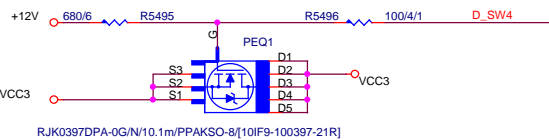
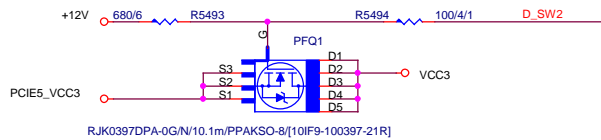
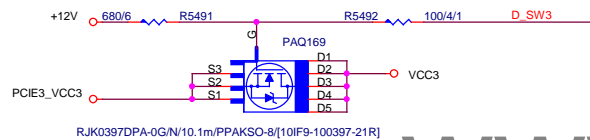
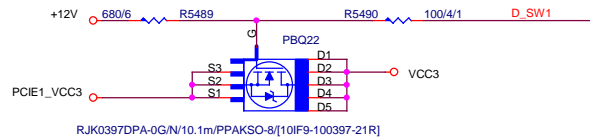
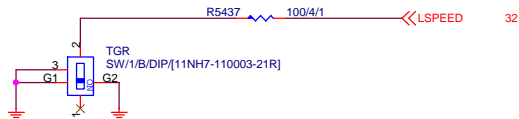




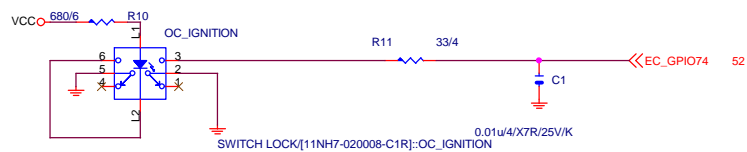




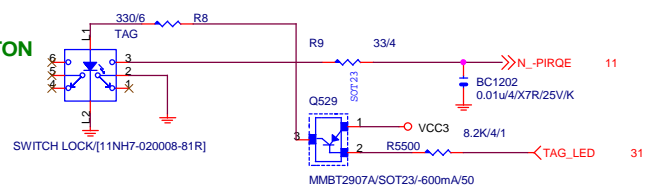




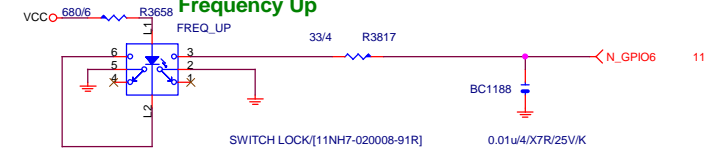
### EnPWR BUTTON



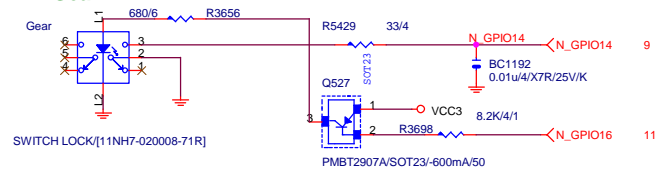
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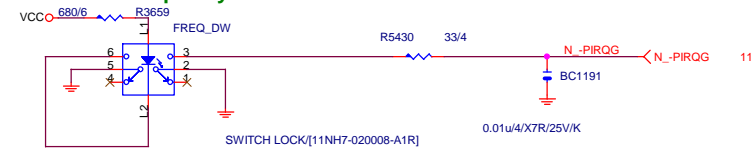
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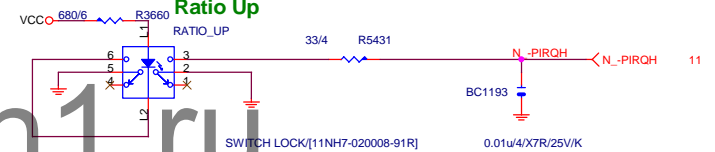
### Gear



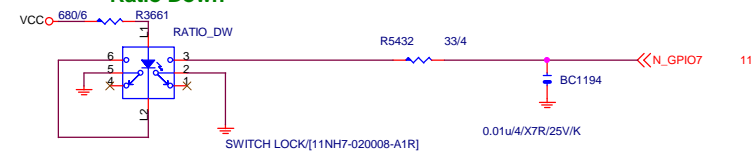
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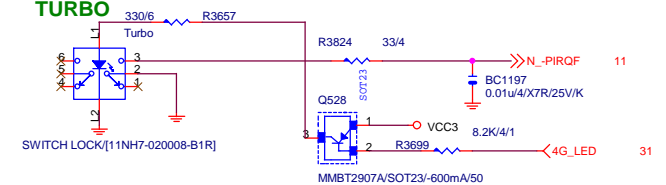
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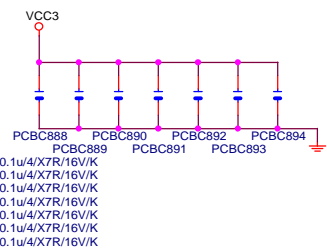
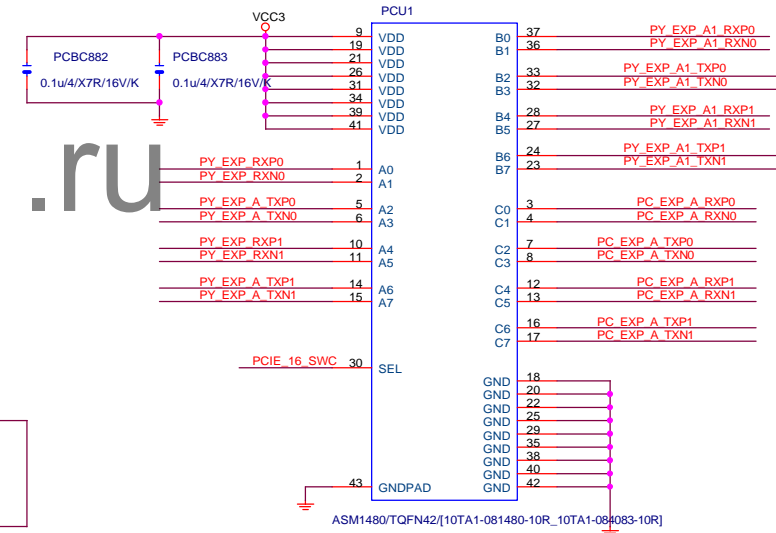
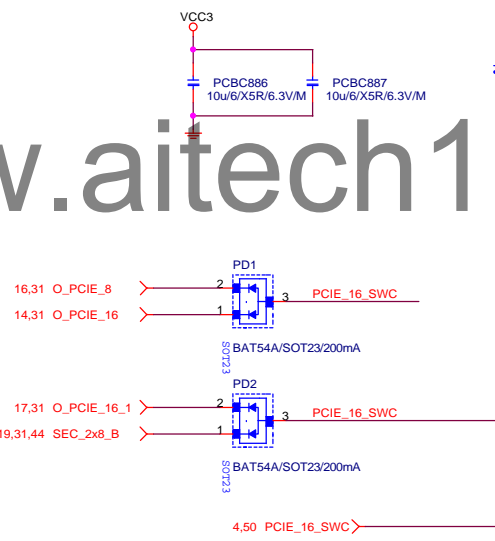
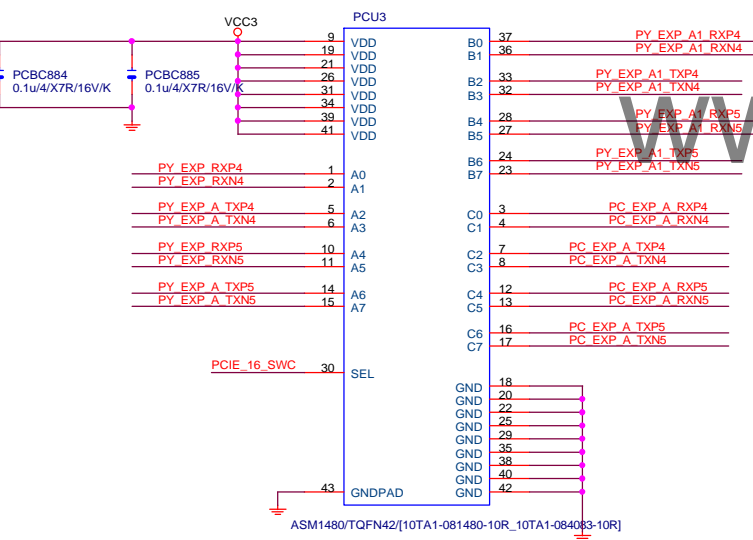
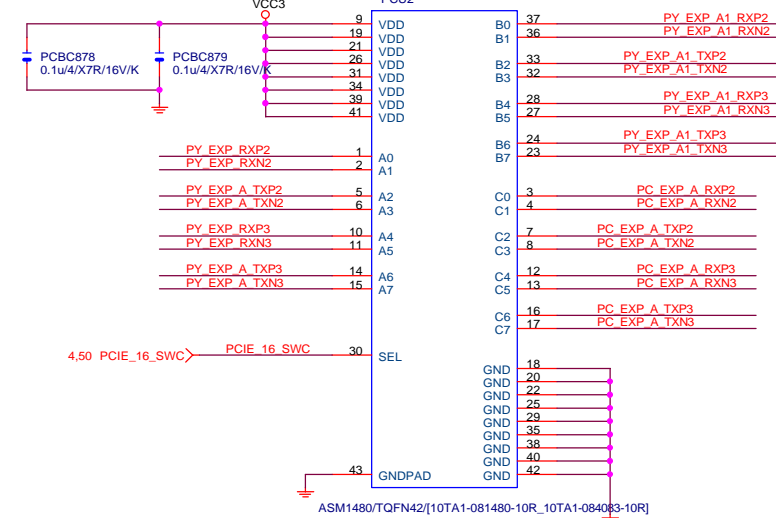
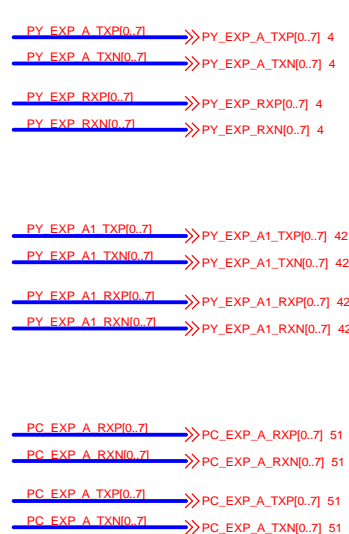
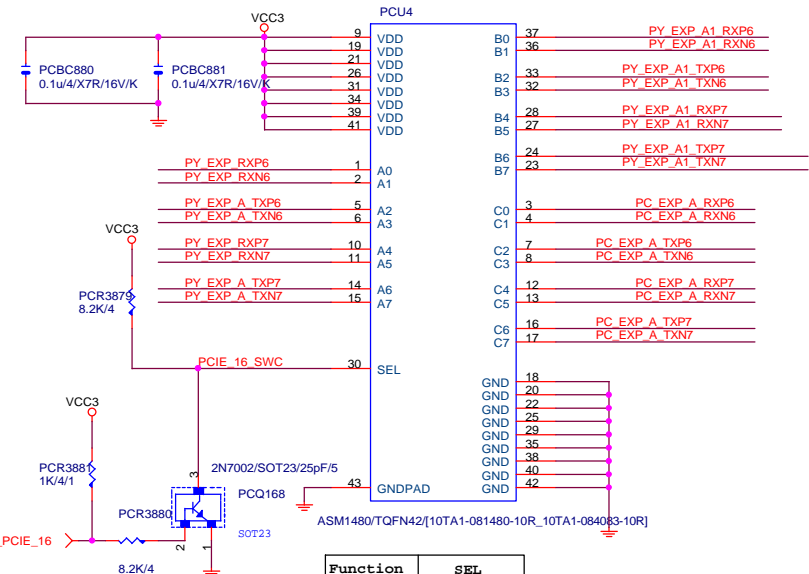
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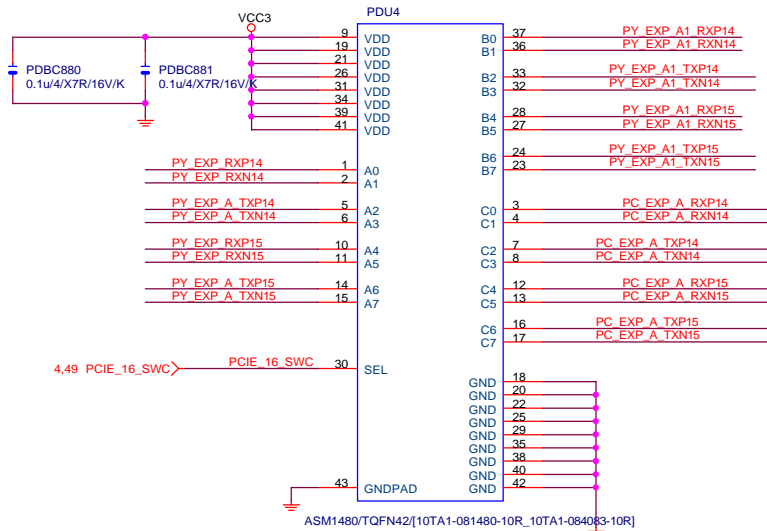


### TURBO

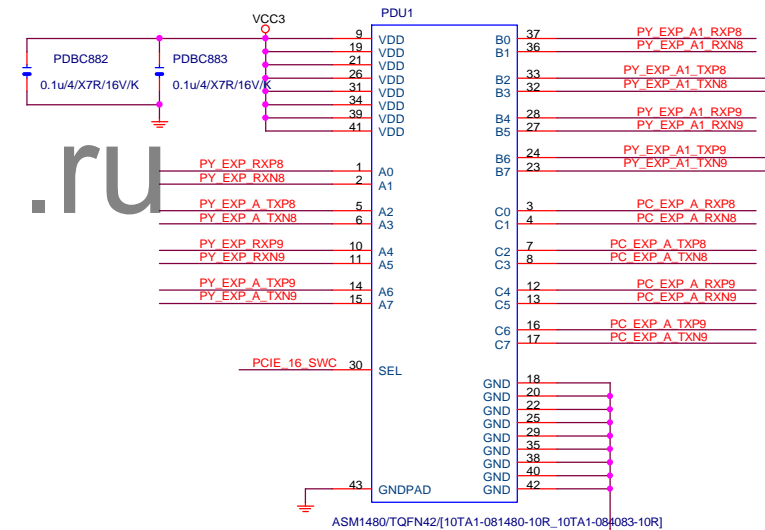
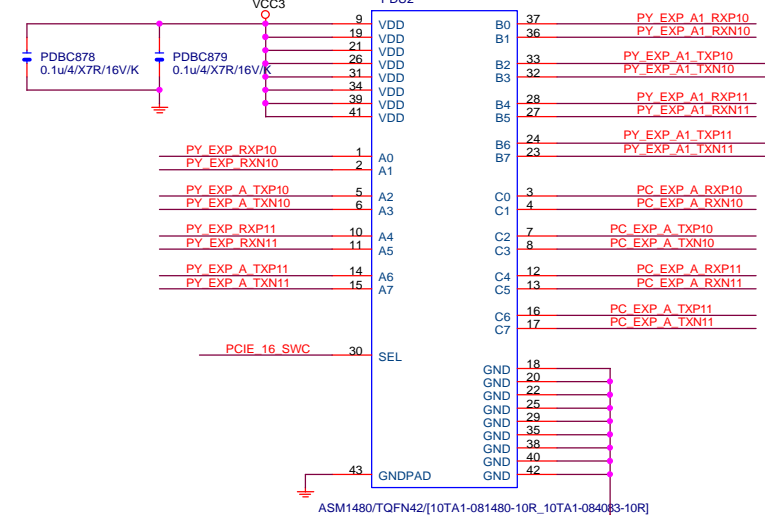
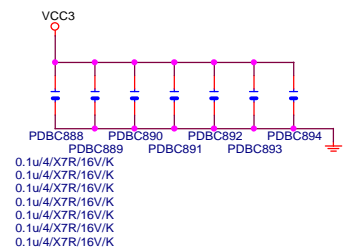
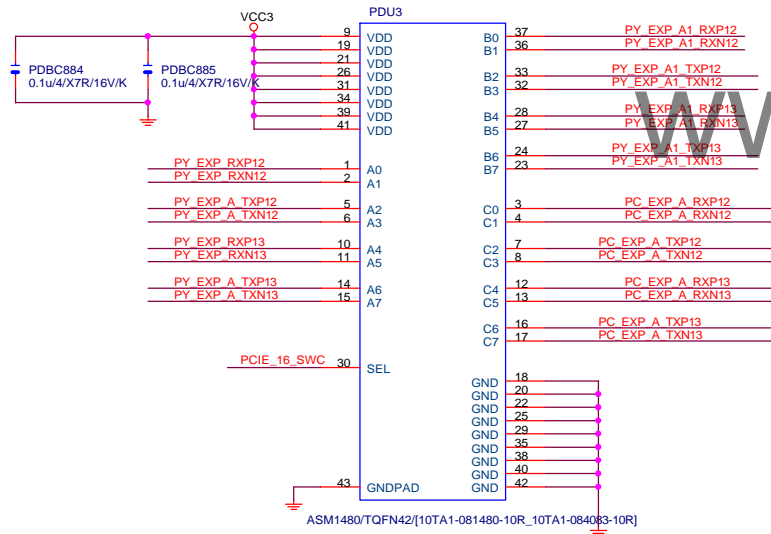


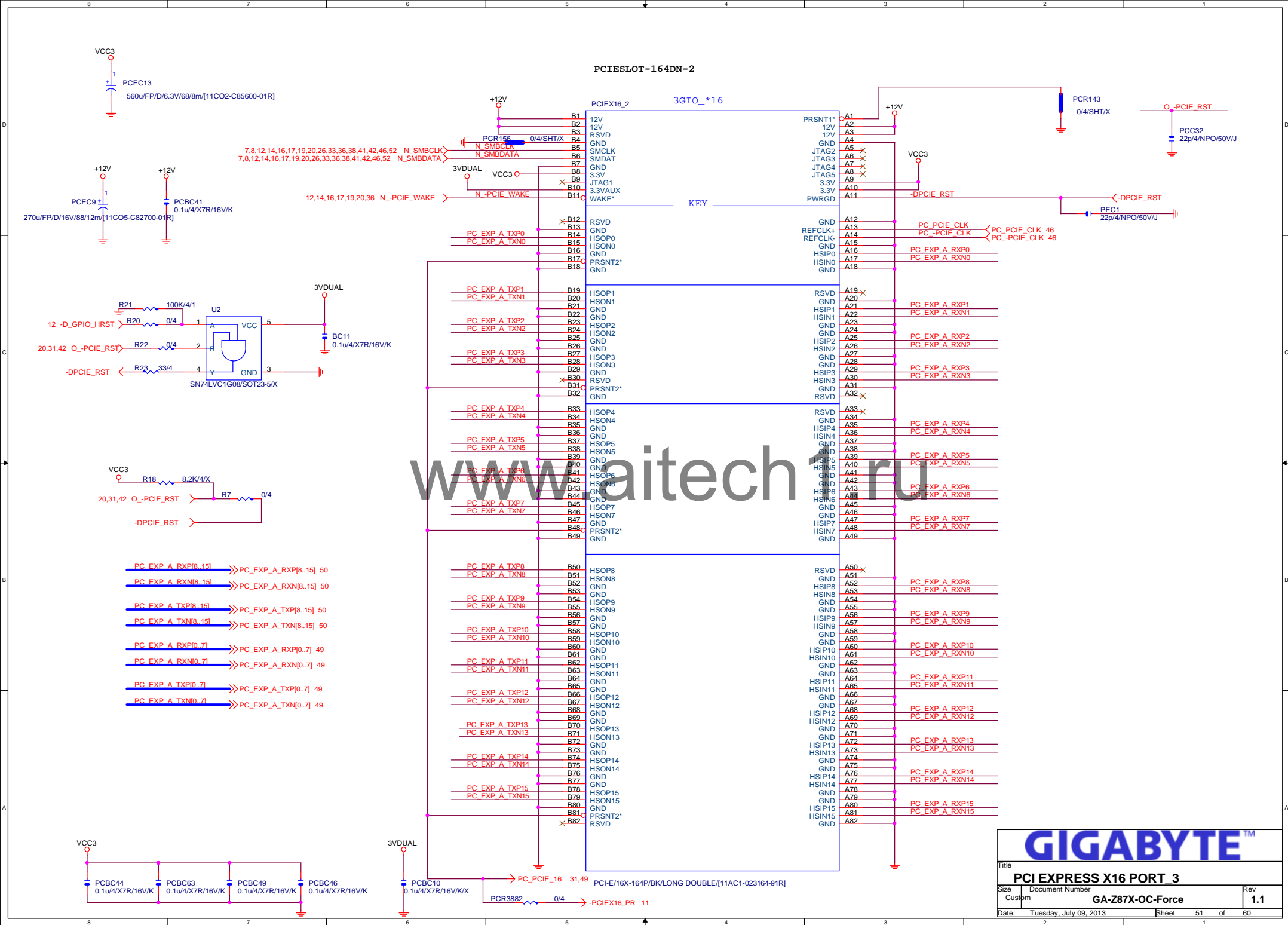
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|------------------|-------------------------|----------------|
| <b>GIGABYTE™</b> |                         |                |
| Title            | <b>SWITCH</b>           |                |
| Size             | Document Number         | Rev            |
| Custom           | <b>GA-Z87X-OC-Force</b> | <b>1.1</b>     |
| Date:            | Tuesday, July 09, 2013  | Sheet 48 of 60 |

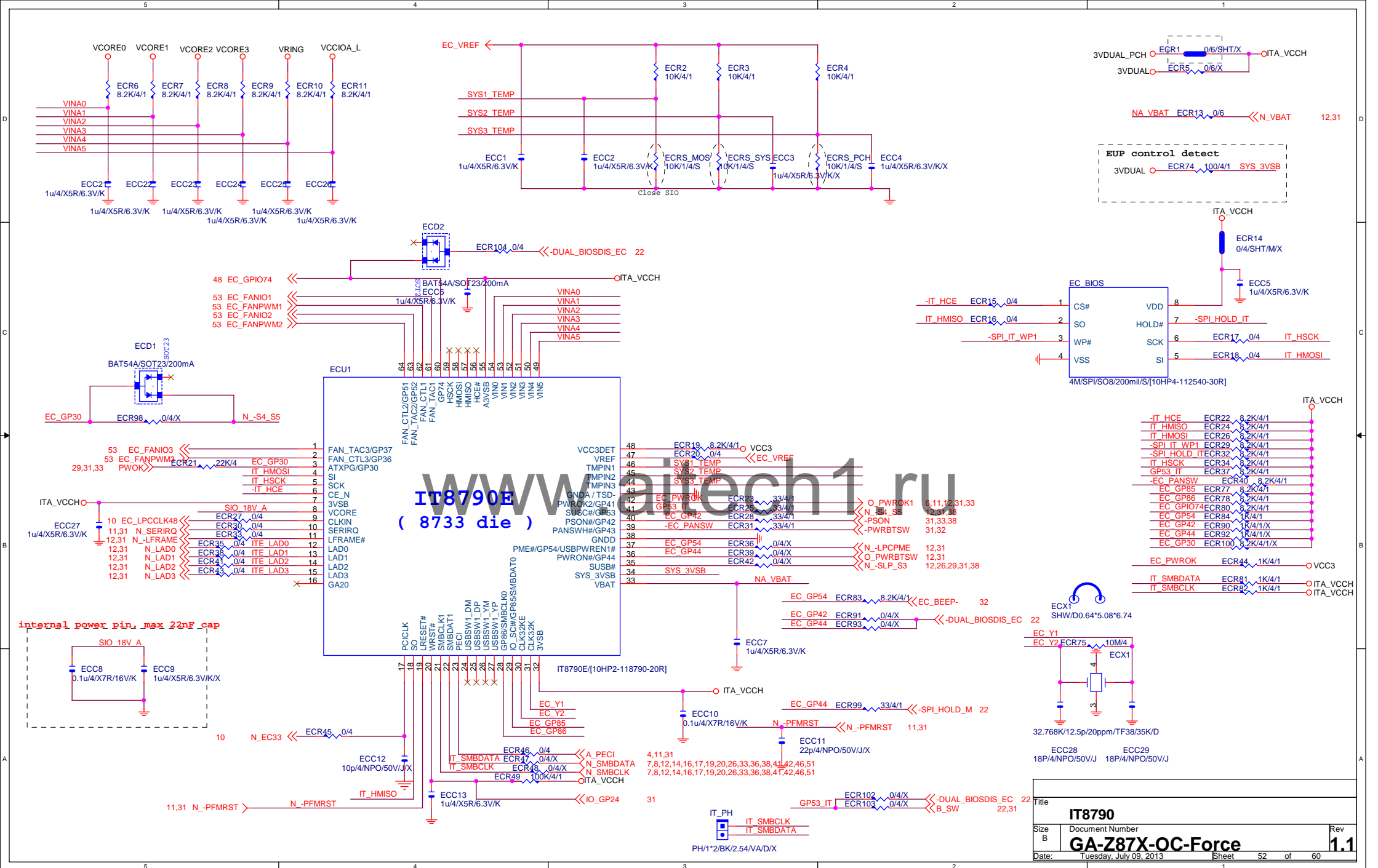




| Function | SEL |
|----------|-----|
| A--> B   | L   |
| A--> C   | H   |

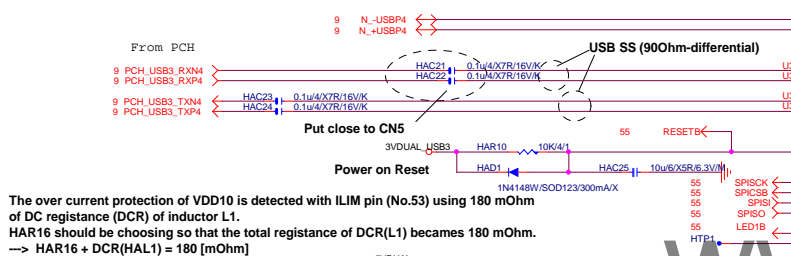
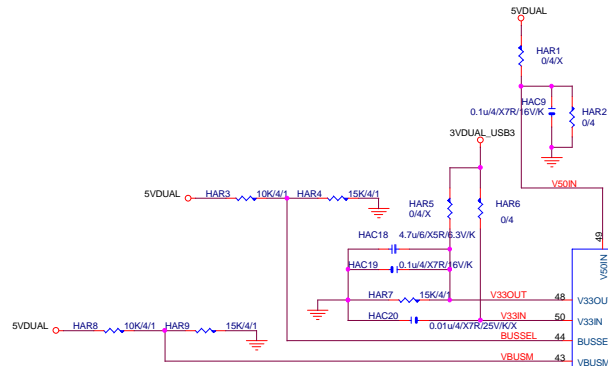
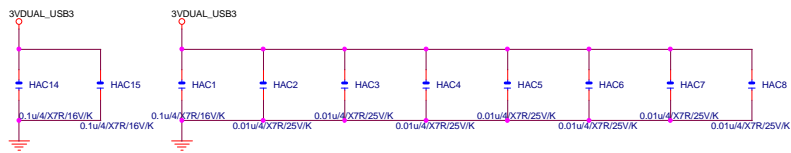




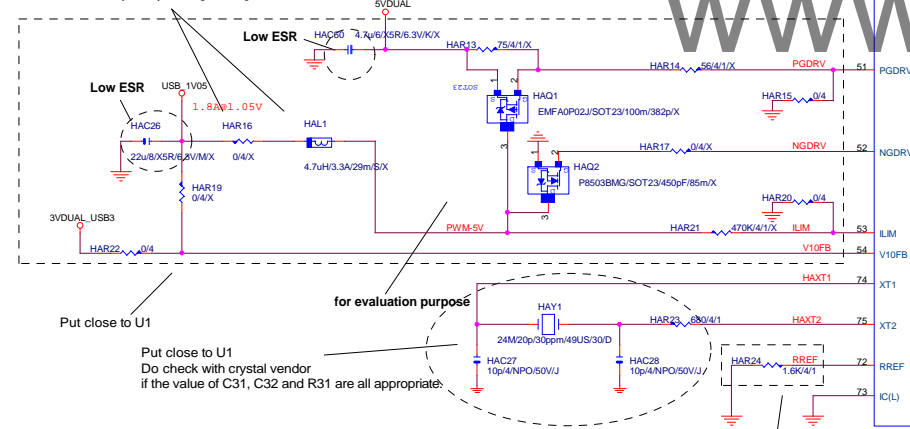








The over current protection of VDD10 is detected with ILIM pin (No.53) using 180 mOhm of DC resistance (DCR) of inductor L1.  
HAR16 should be choosing so that the total resistance of DCR(L1) becomes 180 mOhm.  
→ HAR16 + DCR(HAL1) = 180 [mOhm]

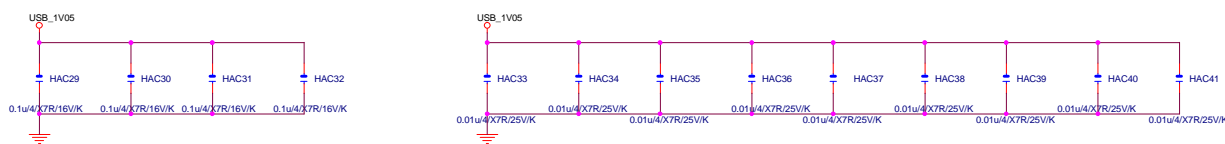
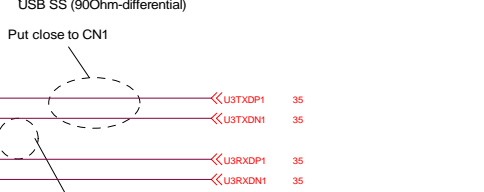
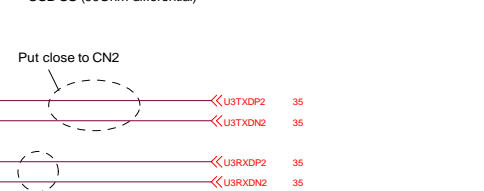
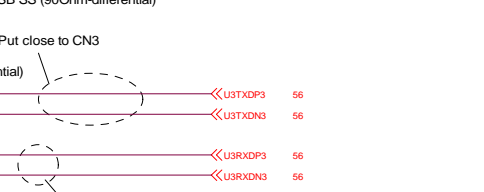
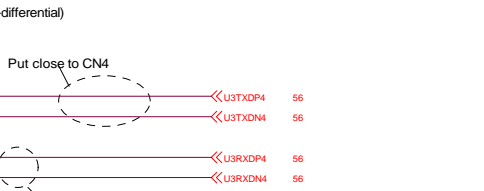
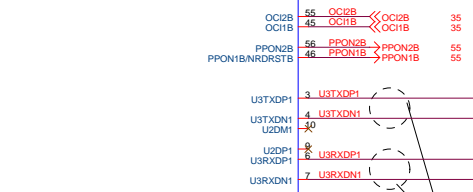
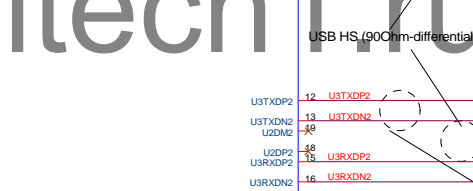
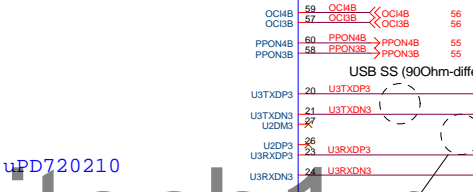
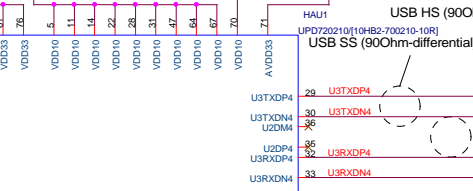
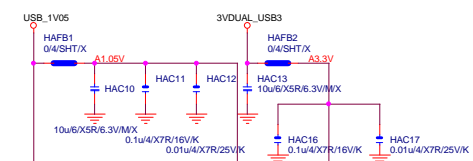


Put close to U1  
Do check with crystal vendor  
if the value of C31, C32 and R31 are all appropriate.

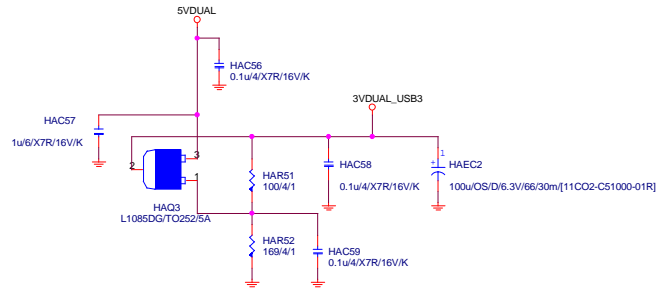
Put close to U1  
Short and broad connection to GND  
Don't split R32 into multiple resistors.

UPD720210

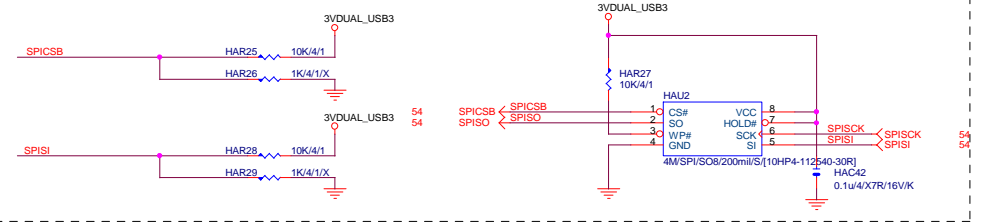
www.aitech1.ru



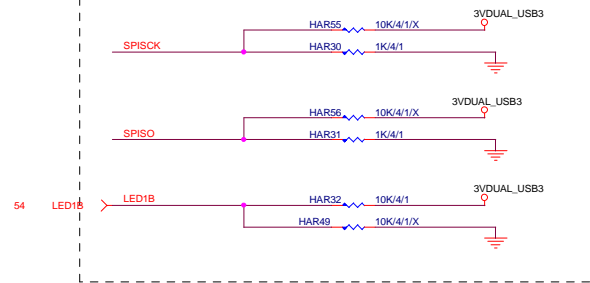
# 3VDUAL\_USB\_1



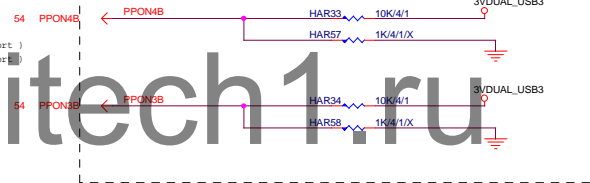
## # External SPI ROM ; SPI ROM attached mode



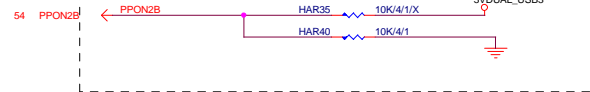
## # Battery Charging



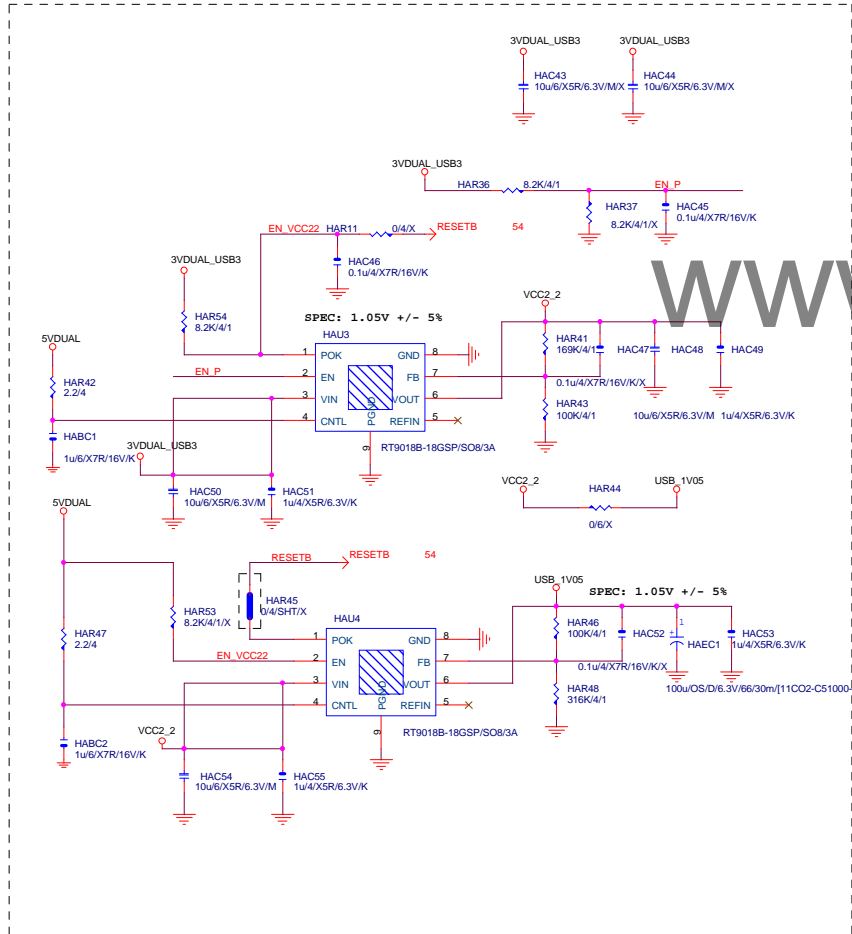
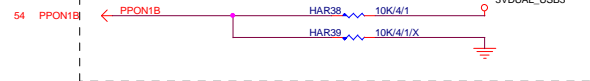
## # Number of Ports ; 4Ports mode



## #5 VBUS Power Control ; Individual mode

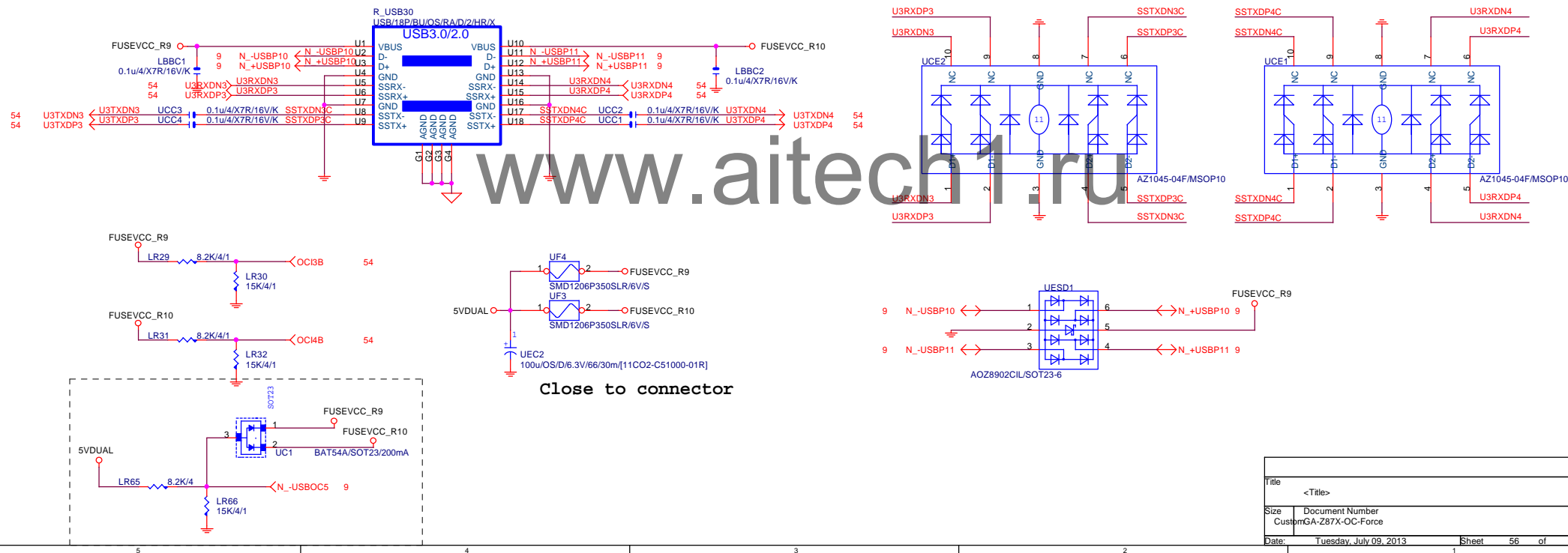


## # PPON1B Pin Function ; Port1 PPONB mode

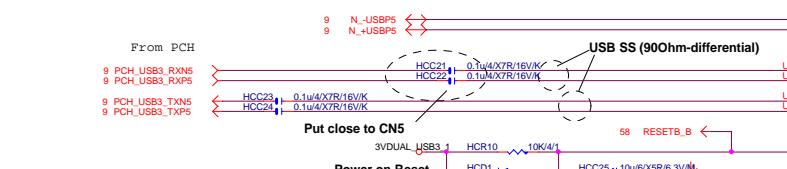
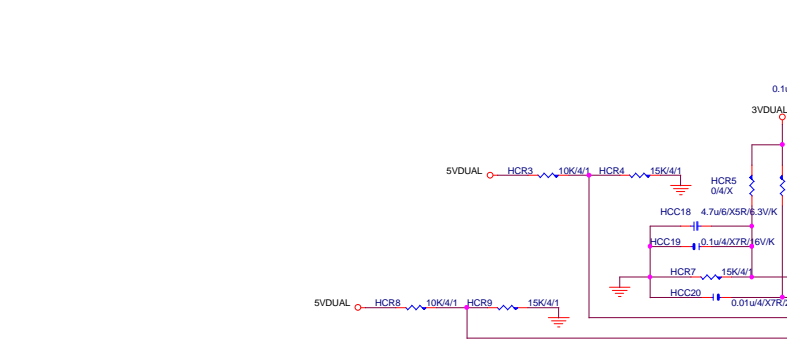
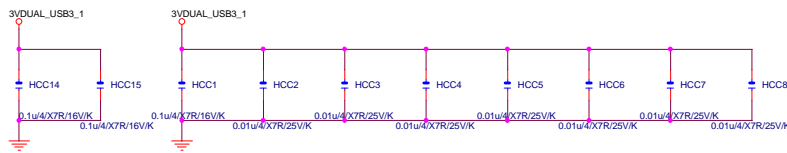


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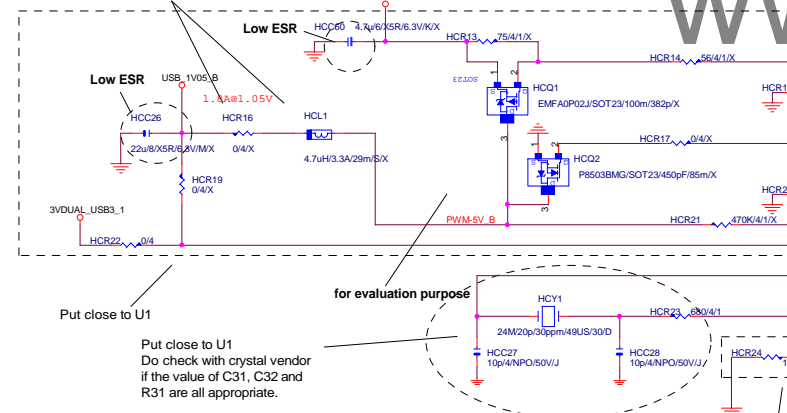
|       |  |     |     |
|-------|--|-----|-----|
| Title | UPD720210 reference design 4port Hub board |     |     |
| Size  | Document Number                            | Rev | 1.1 |
| Date  | Sheet                                      | 55  | of  |



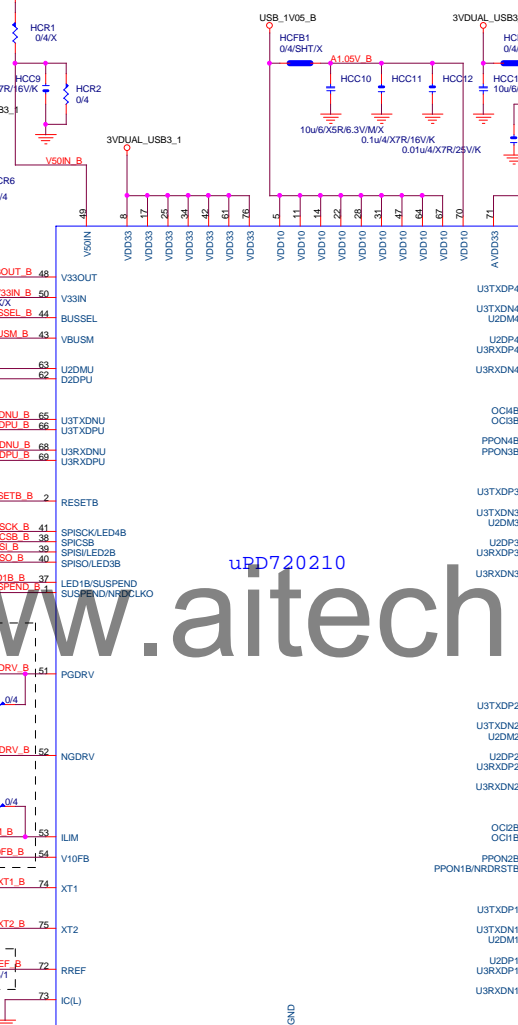
|         |                        |                |
|---------|------------------------|----------------|
| Title   |                        |                |
| <Title> |                        |                |
| Size    | Document Number        | Rev            |
| Custom  | GA-Z87X-OC-Force       | 1.1            |
| Date:   | Tuesday, July 09, 2013 | Sheet 56 of 60 |



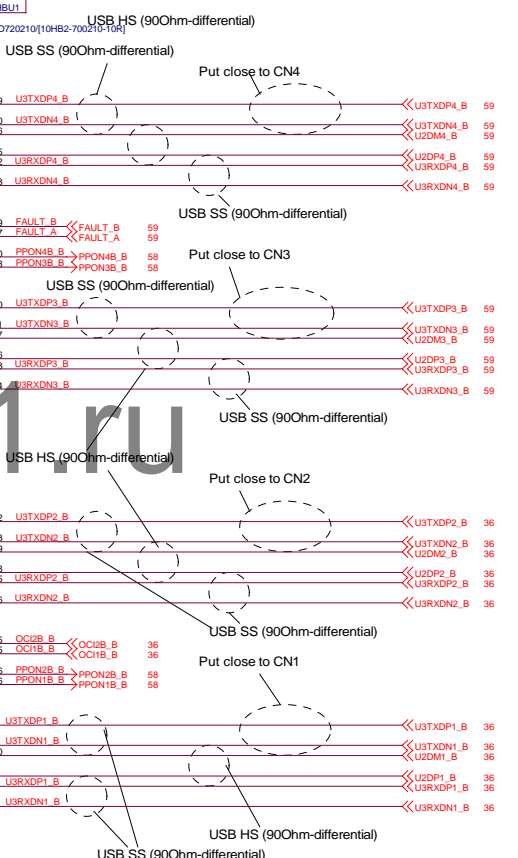
The over current protection of VDD10 is detected with ILIM pin (No.53) using 180 mOhm of DC resistance (DCR) of inductor L1.  
HAR16 should be choosing so that the total resistance of DCR(L1) becomes 180 mOhm.  
→ HAR16 + DCR(HAL1) = 180 [mOhm]



Put close to U1  
Do check with crystal vendor if the value of C31, C32 and R31 are all appropriate.

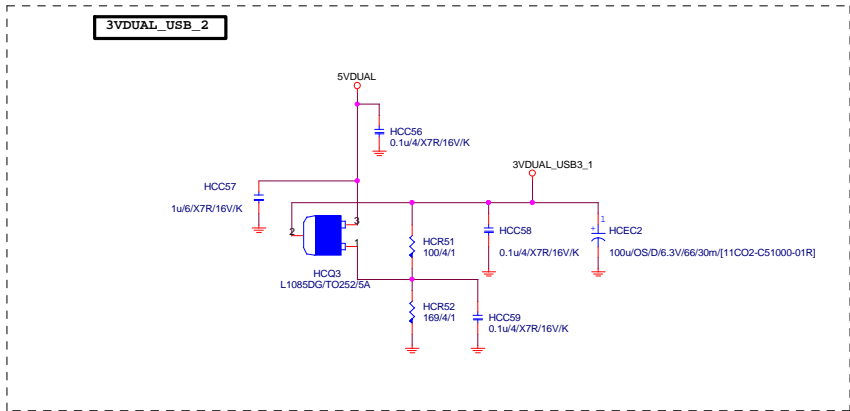


Put close to U1  
Short and broad connection to GND  
Don't split R32 into multiple resistors.

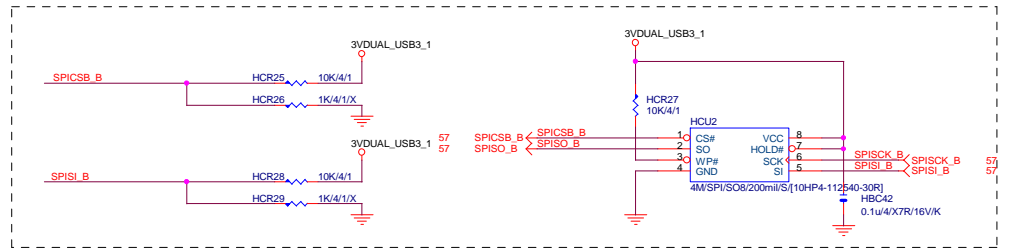


Put close to U1  
Short and broad connection to GND  
Don't split R32 into multiple resistors.

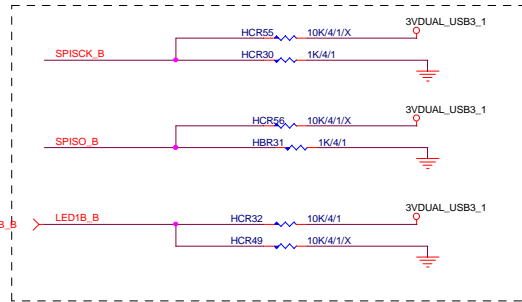
|       |                     |
|-------|---------------------|
| File  | <Title>             |
| Size  | Document Number     |
| C     | GA-287X-OC-F        |
|       | SG-NK1-110006       |
| Date  | Tuesday, 2023-09-13 |
| Sheet | 57 of 80            |
| Rev   | 1.11                |



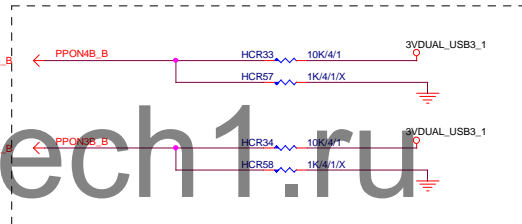
# External SPI ROM ; SPI ROM attached mode



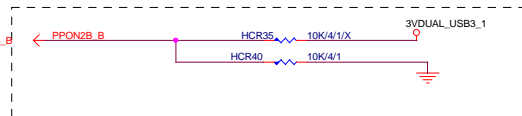
# Battery Charging



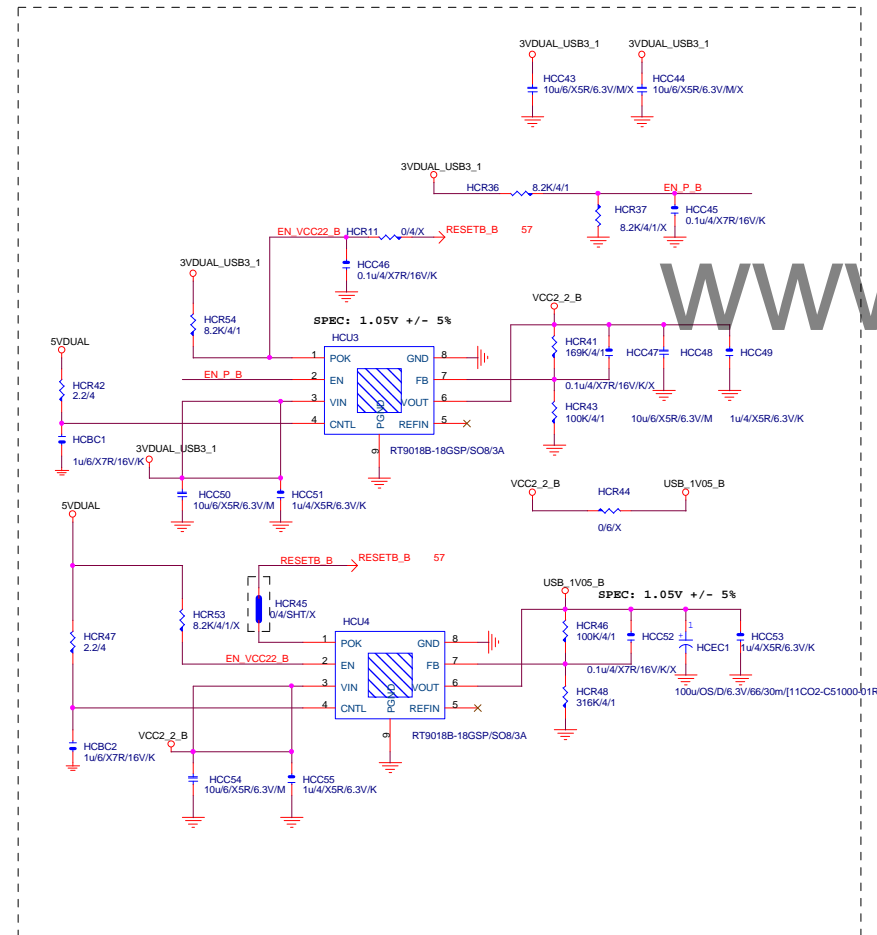
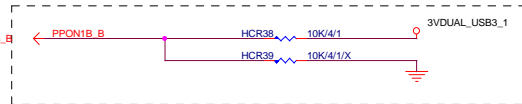
# Number of Ports ; 4Ports mode



#5 VBUS Power Control ; Individual mode

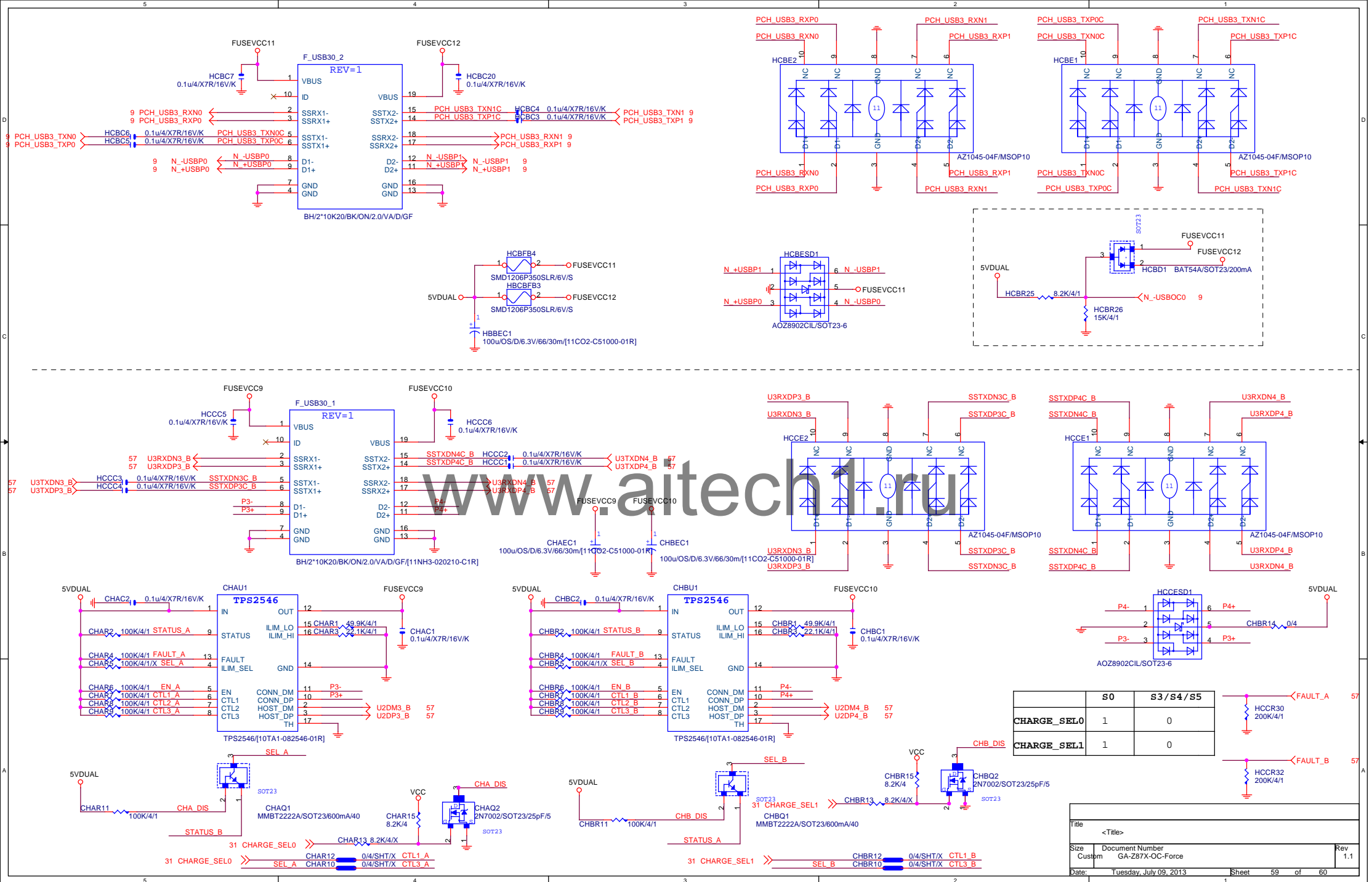


# PPON1B Pin Function ; Port1 PPONB mode



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|       |  |  |  |  |  |
|-------|--|--|--|--|--|
| Title |  |  | UPD720210 reference design 4port Hub board |  |  |
| Size  |  |  | Document Number                            |  |  |
| Date  |  |  | Rev 1.1                                    |  |  |
| Sheet |  |  | 58 of                                      |  |  |



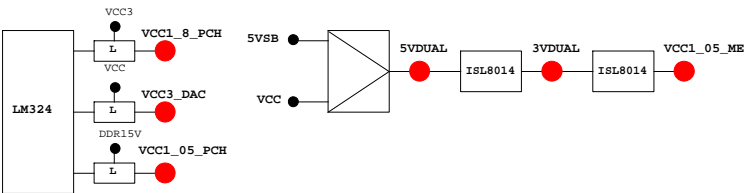
|             | S0 | S3/S4/S5 |  |
|-------------|----|----------|--|
| CHARGE_SEL0 | 1  | 0        |  |
| CHARGE_SEL1 | 1  | 0        |  |

|        |                        |       |          |
|--------|------------------------|-------|----------|
| Title  | <Title>                |       |          |
| Size   | Document Number        | Rev   |          |
| Custpm | GA-Z87X-OC-Force       | 1.1   |          |
| Date:  | Tuesday, July 09, 2013 | Sheet | 59 of 60 |

| PIN NAME       | PWR  | AFTER<br>WDRST | Default | USAGE            | NOTE            |
|----------------|------|----------------|---------|------------------|-----------------|
| GP0            | MAIN | H-Z            | GPI     | -PECT_REQ        | N/A             |
| GP1/TACH1      | MAIN |                | GPI     | ICH_FAN_TACH1    | N/A             |
| GP2/PIRQE#     | MAIN |                | GPI     | -PIRQE           | P/U 8.2K VCC3   |
| GP3/PIRQF#     | MAIN |                | GPI     | -PIRQF           | P/U 8.2K VCC3   |
| GP4/PIRQG#     | MAIN |                | GPI     | -PIRQG           | P/U 8.2K VCC3   |
| GP5/PIRQH#     | MAIN |                | GPI     | -PIRQH           | P/U 8.2K VCC3   |
| GP6/TACH2      | MAIN |                | GPI     | ICH_FAN_TACH2    | N/A             |
| GP7/TACH3      | MAIN |                | GPI     | ICH_FAN_TACH3    | N/A             |
| GP8            | STBY | H              | GPO     | GPIO8            | P/U 8.2K 3VDUAL |
| GP9/OC5#       | STBY |                | NATIVE  | OC5#             | N/A             |
| GP10/OC6#      | STBY |                | NATIVE  | OC6#             | N/A             |
| GP11/SMBALERT# | STBY |                | NATIVE  | -SMBALERT        | P/U 8.2K 3VDUAL |
| GP12           | STBY | L              | GPI     | LAN_PHY_PWR_CTRL | P/U 8.2K 3VDUAL |
| GP13           | STBY | L              | GPI     | GPIO13           | P/U 8.2K 3VDUAL |
| GP14/OC7#      | STBY |                | NATIVE  | OC7#             | N/A             |
| GP15           | STBY | L              | GPO     | GPIO15           | N/A             |
| GP16           | MAIN |                | GPI     | -SKTOCC          | P/U 8.2K VCC3   |
| GP17/TACH0     | MAIN |                | GPI     | ICH_FAN_TACH0    | N/A             |
| GP18           | MAIN |                | NATIVE  | MB_ID0           | P/D 8.2K GND    |
| GP19           | MAIN |                | GPI     | -LAN1_ISO        | P/U 8.2K VCC3   |
| GP20           | MAIN |                | NATIVE  | LED_CTL          | P/U 1K VCC3     |
| GP21           | MAIN |                | GPI     | VCC18_PCH_OV2    | P/U 8.2K VCC3   |
| GP22           | MAIN | H-Z            | GPI     | VCORE_OV3        | P/U 8.2K VCC3   |
| GP23           | MAIN |                | NATIVE  | -LDRQ1           | P/U 8.2K VCC3   |
| GP24           | STBY | L              | GPO     | TLS              | P/U 8.2K 3VDUAL |
| GP25           | STBY |                | NATIVE  | -CPU_STOP        | P/U 8.2K 3VDUAL |
| GP26           | STBY |                | NATIVE  | -ACZ_DET         | P/U 8.2K 3VDUAL |
| GP27           | STBY | H              | GPO     | GPIO27           | P/U 8.2K 3VDUAL |
| GP28           | STBY | H              | GPO     | GPIO28           | P/U 8.2K 3VDUAL |
| GP29           | STBY | L              | GPI     | GPIO29           | N/A             |
| GP30           | STBY | H-Z            | GPI     | S_PWR_ACK        | P/U 100K 3VDUAL |
| GP31           | STBY | H-Z            | GPI     | N/A(Reverse)     | P/U 8.2K VCC3   |
| GP32           | MAIN | H              | GPO     | MB_ID1           | P/D 8.2K GND    |
| GP33           | MAIN | H              | GPO     | LOAD-LINE        | P/U 1K VCC3     |
| GP34           | MAIN | H-Z            | GPI     | -PCI_STOP        | P/U 8.2K VCC3   |
| GP35           | MAIN | L              | GPO     | GPIO35           | P/U 8.2K VCC3   |
| GP36           | MAIN |                | GPI     | -LAN1_DSM        | P/U 8.2K VCC3   |
| GP37           | MAIN |                | GPI     | N/A              | P/U 8.2K VCC3   |
| GP38           | MAIN | H-Z            | GPI     | VCORE_OV2        | P/U 8.2K VCC3   |
| GP39           | MAIN | H-Z            | GPI     | -LAN_DSM         | P/U 8.2K VCC3   |
| GP40           | STBY |                | NATIVE  | OC1#             | N/A             |
| GP41           | STBY |                | NATIVE  | OC2#             | N/A             |
| GP42           | STBY |                | NATIVE  | OC3#             | N/A             |
| GP43           | STBY |                | NATIVE  | OC4#             | N/A             |
| GP44           | STBY | L              | NATIVE  | N/A              | P/U 8.2K 3VDUAL |
| GP45           | STBY |                | NATIVE  | -LPCPME          | P/U 8.2K 3VDUAL |
| GP46           | STBY | L              | NATIVE  | PWR_LED          | P/U 8.2K 3VDUAL |
| GP47           | STBY |                | NATIVE  | FS1_LED          | P/U 8.2K 3VDUAL |
| GP48           | MAIN | H-Z            | IN      | EN_PWM           | P/U 8.2K VCC3   |
| GP49           | MAIN | H-Z            | IN      | VCC18_OV1        | P/U 8.2K VCC3   |
| 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  | N/A(Reverse)     | P/U 8.2K 3VDUAL |
| GP57           | STBY | H-Z            | IN      | VCORE_OV1        | P/U 8.2K 3VDUAL |
| GP58           | STBY | H-Z            | NATIVE  | F_USB_OC         | P/U 8.2K 3VDUAL |
| GP59           | STBY |                | NATIVE  | USB_OC0#         | N/A             |
| GP60           | STBY | H-Z            | NATIVE  | N/A(Reverse)     | P/U 8.2K 3VDUAL |
| GP61           | STBY | L              | NATIVE  | -SUSTAT          | N/A             |
| GP62           | STBY | L              | NATIVE  | SUSCLK           | N/A             |
| GP63           | STBY | L              | NATIVE  | GPIO63           | N/A             |
| GP64           | MAIN | L              | NATIVE  | CLKOUTFLEX0      | N/A             |
| GP65           | MAIN | L              | NATIVE  | CLKOUTFLEX1      | N/A             |
| GP66           | MAIN | L              | NATIVE  | CLKOUTFLEX2      | N/A             |
| GP67           | MAIN | L              | NATIVE  | CLKOUTFLEX3      | N/A             |
| GP72           | STBY | H-Z            | NATIVE  | VCORE_OV4        | P/U 8.2K 3VDUAL |
| GP73           | STBY |                | NATIVE  | 1_05V_OV1        | P/U 8.2K 3VDUAL |
| 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 |

| 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/SEN                   | LOW_PWR_1         |                  |
| VIDO5/GP27/SEN2            | LOW_PWR_2         |                  |
| PCIRST2#/GP11              | -PFMRST1          |                  |
| PCIRST1#/GP12              | -PFMRST2          |                  |
| 3VSBSW#/GP40               | CSI_F0            | BSEL166_1        |
| SUSC#/GP53                 | CSI_F1            | BSEL166_2        |
| GP23/SI                    | BSEL166_3/CSISBSL |                  |
| VIDO0/GP20/CTS2#           | CPUT_LED1_C       | BSEL166_4        |
| GP65/VDDA_EN/GB_01         | MB_ID2            |                  |
| PD6/GP76/BUSSO1            | MB_ID3            |                  |
| PD7/GP77/BUSSO2            | MB_ID4            |                  |
| AFD#/GP86/SMBC_R           | 2# PIN            | FST_2X8          |
| INIT#/GP85/SMBD_M          | SEC_2x8           | GTLREF_AD2       |
| ACK#/GP83                  | DDR_LED1_C        |                  |
| VIDO1/GP21/DCD2#           | DDR_LED2_C        |                  |
| STB#/GP87/SMBC_M           | DDR_LED3_C        |                  |
| PWRON#GP44                 | VCORE_OV1         |                  |
| PANSWH#/GP43               | PWRBTSW           |                  |
| KDAT/GP61                  | -PWRBTSW          |                  |
| KCLK/GP60                  | KDAT              |                  |
| MDAT/GP57                  | KCLK              |                  |
| MACL/GP56                  | MDAT              |                  |
| GP66/VLDT_EN/GB_02         | NBT_LED1_C        | MCLK             |
| SVD/PCIRSTIN#/CIRTX/GP15   | PWM2_CR           |                  |
| KDAT/GP61                  | PWM2_CR           |                  |
| GP67/CPU_PG/GB_03          | EN_LOADLINE       | IT_GP67/-EN_PWM2 |
| SLIN#/GP84/SMBD_R          | -EN_PWM2          |                  |
| PS1_L/FAN_CLT5/CIRRX2/GP16 | -THERM            |                  |
| VIDO4/GP26/SOUT2           | DDR18V_PH2_EN     |                  |
| VIDO2/FAN_TAC5/GP24/DSR2#  | DDR18V_LED        |                  |
| VIDO6/GP17/RI2#            | 1_1V_PH_EN        |                  |
| VIDO7/JP6/DTR2#            | JP6               |                  |
| PD5/GP75/BUSS00            | SB_LED3_C         |                  |



The diagram illustrates a 2D mesh network topology. It consists of 16 nodes arranged in a 4x4 grid. The nodes are labeled as follows:

- Top row: PH1, PH2, PH8, PH7
- Second row: DL2, DL4, DL9, DL7
- Third row: PH5, PH6, DL3, DL5
- Bottom row: PH3, PH4, DL6, DL8

There are 40 links connecting the nodes in a 2D mesh pattern. The links are labeled as follows:

- Vertical links (16): VTT, VTT, VTT, VTT, VTT, VTT, VTT, VTT, VTT, VTT, VTT, VTT, VTT, VTT, VTT, VTT
- Horizontal links (24): VTT, VTT

The diagram also shows a central CPU node and a peripheral PCH node connected to the mesh.

**散熱模組料號:**

| 線路圖名稱              | BIOS選項           |
|--------------------|------------------|
| Vcore              | CPU Vcore        |
| CPU_VTT            | CPU Termination  |
| CPU_VAUXG          | CPU Graphic Core |
| VCC1_8_PCH         | CPU PLL          |
| VCC1_05_PCH        | PCH core         |
| 3VDUAL             | 3VDUAL           |
| DDR15V             | DRAM voltage     |
| DDRVTT             | DRAM Termination |
| VREF_CA_AVREF_CA_B | DRAM Address Ref |
| VREF_DQ_AVREF_DQ_B | DRAM Data Ref    |

|         | 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        |