**How to Wirte a Configuration File for GPIO Loopback, Hardware Monitor and Bypass Test Program**

Most information can be found in schematic of mother board and datasheet of SuperIO/PCH. If you can’t find it, please ask BIOS engineer for detail.

1. **GPIO Loopback**

* Create a file and name it as this format: *BOARD\_NAME.conf*, i.e., if you want to create a configuration file for S0981, the configuration file name should be “*S0981.conf*”.
* Copy the following text (blue color) and paste in the configuration file. Please don’t add or remove any line from this header.  
  *# DON NOT MODIFY THIS HEADER  
  # First line: chipset base\_address  
  # Second line: numbers of GPIO  
  # Third line: GPIO number ..., separate with space*
* Write SIO/PCH and GPIO base address in the same line, separate with space, i.e., “*PCH 1C00*”, “*PCH 500*” and “*SIO 4E*”, where 500 and 1C00 is the GPIO base address for SandyBridge/IvyBridge and Haswell, 4E is the I/O address for SuperIO.
* Search “*JGPIO*” or “*GPIO*” in Engineer SPEC, and you will find something like this: GPXY or GPIOXY, where XY is GPIO number. In this case, we can find that there are 8 GPIOs in GPIO Header.

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| JGPIO1  GPIO Pin Header  ( 4 GPI + 4 GPO) | sshot-694 | |  |  |  |  | | --- | --- | --- | --- | | **Pin** | **Name** | **Pin** | **Name** | | 1 | PCH\_USERI\_GP10 | 2 | PCH\_USERO\_GP26 | | 3 | PCH\_USERI\_GP18 | 4 | PCH\_USERO\_GP44 | | 5 | PCH\_USERI\_GP20 | 6 | PCH\_USERO\_GP45 | | 7 | PCH\_USERI\_GP25 | 8 | PCH\_USERO\_GP46 | | 9 | GND | 10 | No pin / KEY |   Note: GPIO signal number can be change.  MSI P/N: N31-2051451-H06  Pitch: 2mm  Pin length: 2.2mm |

* Write the GPIO numbers by order in the same line, separate with space. For GPIO loopback test, we always use jumper to short pin1 and pin2, pin3 and pin4 … etc, so this line should be “*10 26 18 44 20 45 25 46*”.
* i.e., S0981.conf:  
  # DON NOT MODIFY THIS HEADER  
  # First line: chipset base\_address  
  # Second line: numbers of GPIO  
  # Third line: GPIO number ..., separate with space  
  PCH 1C00  
  8  
  10 26 18 44 20 45 25 46

1. **Hardware Monitor**

* Create a file and name it as this format: *BOARD\_NAME.conf*, i.e., if you want to create a configuration file for S0981, the configuration file name should be “*S0981.conf*”.
* Copy the following text (blue color) and paste in the configuration file. Please don’t add or remove any line from this header.  
  *# DO NOT MODIFY THIS HEADER  
  # First line: chip\_name, address  
  # Others: sensor\_name, pin, par1, par2, min, max, multiplier*
* Write SuperIO chip name and I/O address in the same line, separate with comma. i.e., “*AST1300, 0x2E*”, “*NCT6779D, 0x4E*” and “F71889AD, 0x4E”, where *AST1300*, *NCT6779D* and *F71889AD* is SuperIO chip, *0x2E* and *0x4E* is the I/O address.
* Write *sensor\_name, pin, par1, par2, min, max, multiplier* in the same line.
* *sensor\_name*, please refer to hardware monitor page in BIOS.
* *pin*, the pin number of the sensor, PECI or I2C. It can be found in schematic of mother board and datasheet of SuperIO.

For example, you can find the PECI pin number is AA21 in S0211 schematic:



Also, you can find PECI pin number in AST1300 datasheet:



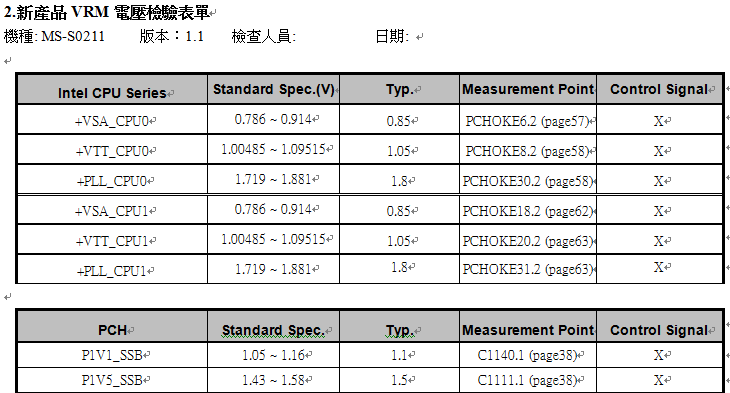
* *par1* and *par2* are the value of resistors, *par1* for vertical and *par2* for horizontal. You can find this in mother board schematic. The following circuit is capture from schematic of S0211.





In this case, ADC0(+5VSB) has 2 resistors, both of the resistors are vertical, so the summary of the resistors is 2.8(1.8KR + 1KR), for calculation, we record it as 28, so *par1* is 28, *par2* is 0.

* *min* and *max* is the minimize and maximize value of the sensor, you can find it in “生產加工注意事項”



* *multiplier*, it is 0 in most cases, it is non-zero when we can’t calculate the voltage with the following equations:

For example, we can’t calculate Voltage\_VTT\_CPU1 on S0591 with above equations, after asking the BIOS engineer, we add another equation:

And then we set the multiplier to 2.5 to get the correct voltage.

Make sure the value is correct in BIOS and then calculate the corresponding *multiplier*.

* i.e., S0211.conf:

# DO NOT MODIFY THIS HEADER

# First line: chip\_name, address

# Others: sensor\_name, pin, par1, par2, min, max, multiplier

AST1300, 0x2E

TEMP\_CPU0, AA21, 0, 0, 20, 100, 0

TEMP\_CPU1, AA21, 0, 0, 20, 100, 0

TEMP\_BMC, D1, 0, 0, 20, 100, 0

TEMP\_ENV, D1, 0, 0, 20, 100, 0

CPU\_FAN0, V6, 0, 0, 100, 10000, 0

CPU\_FAN1, Y5, 0, 0, 100, 10000, 0

JFAN1, AA4, 0, 0, 100, 10000, 0

JFAN2, AB3, 0, 0, 100, 10000, 0

JFAN3, W6, 0, 0, 100, 10000, 0

JFAN4, AA5, 0, 0, 100, 10000, 0

5VSB, L5, 28, 0, 4.75, 5.25, 0

3VSB, L4, 20, 0, 3.135, 3.465, 0

VCC5, L3, 28, 0, 4.75, 5.25, 0

VCC3, L2, 20, 0, 3.135, 3.465, 0

VCC12, L1, 66, 0, 11.4, 12.6, 0

VBAT, M5, 30, 0, 2, 3.47, 0

VCC\_CPU0, M4, 10, 0, 0.6, 1.35, 0

VCC\_CPU1, M3, 10, 0, 0.6, 1.35, 0

VTT\_CPU0, M2, 10, 0, 1.005, 1.095, 0

VTT\_CPU1, M1, 10, 0, 1.005, 1.095, 0  
PLL\_CPU0, N5, 10, 0, 1.719, 1.881, 0

PLL\_CPU1, N4, 10, 0, 1.719, 1.881, 0

1. **Bypass**

* Create a file and name it as this format: *BOARD\_NAME.conf*, i.e., if you want to create a configuration file for S0361, the configuration file name should be “*S0361.conf*”.
* Copy the following text (blue color) and paste in the configuration file. Please don’t add or remove any line from this header.  
  *# DO NOT MODIFY THIS HEADER  
  # 1st line: chip\_name(PCH/SIO/AST1300), address(500/1C00/2E/4E)  
  # 2nd line: 3 GPIOs for PAIR, by order. pair1, pair2, pair3  
  # 3rd line: 3 GPIOs for CFG, by order. pair1, pair2, pair3  
  # 4th line: GPIO for SENDBIT*
* Write chipset or SuperIO and GPIO base address or I/O address in 1st line, separate with comma. i.e., “*PCH, 500*” or “*AST1300, 2E*”, where PCH and AST1300 is chipset and SuperIO, 500 and 2E is the GPIO base address and I/O address.
* Write GPIOs for PAIR in 2nd line. These GPIOs can be found in schematic of mother board(search “PAIR”) and please make sure write it by order. For example, S0361 use GPIO24, GPIO27 and GPIO14 for PAIR.



So the 2nd line should be: *24, 27, 14*

* Write GPIOs for CFG in 3rd line. These GPIOs can be found in schematic of mother board(search “CFG”) and please make sure write it by order. For example, S0361 use GPIO28, GPIO26 and GPIO25 for CFG.

So the 3rd line should be: *28, 26, 25*

* Write GPIO for SENDBIT in 4th line. The GPIO can be found in schematic of mother board(search “sendbit” or “sendhit”) and please make sure write it by order. For example, S0361 use GPIO29 for SENDBIT.

So the 4th line should be: *29*

* i.e., S0361.conf:

# DO NOT MODIFY THIS HEADER

# 1st line: chip\_name(PCH/SIO/AST1300), address(500/1C00/2E/4E)

# 2nd line: 3 GPIOs for pair, by order. pair1, pair2, pair3

# 3rd line: 3 GPIOs for CFG, by order. pair1, pair2, pair3

# 4th line: GPIO for sendbit

PCH, 500

24, 27, 14

28, 26, 25

29

* S0961 is a special case, because it use different GPIOs to control different CPLD. GPIO69, GPIO70 and GPIO71 for PAIR1/2, GPIO38, GPIO33 and GPIO49 for PAIR3/4, GPIO15, GPIO5 and GPIO4 for PAIR5/6.
* i.e., S0961.conf:

# DO NOT MODIFY THIS HEADER

# 1st line: chip\_name(PCH/SIO/AST1300), address(500/1C00/2E/4E)

# 2nd line: 3 GPIOs for pair, by order. pair1, pair2, pair3

# 3rd line: 3 GPIOs for CFG, by order. pair1, pair2, pair3

# 4th line: GPIO for sendbit

PCH, 1C00

69, 70, 71, 38, 33, 49, 15, 5, 4

1, 32, 68, 2, 3, 39, 52, 72, 22

6, 21, 54