

# User Manual

Intel® Tiger Lake Processor  
ITX-B110 VER:1.1



Internet of Things (IOT) Solution Leader

Order Information

| NO. | Model                          | Processor | Frequency | Memory   | VGA | HDMI | LVDS      | EDP | LAN     | USB | COM | 485/422 | Power |
|-----|--------------------------------|-----------|-----------|----------|-----|------|-----------|-----|---------|-----|-----|---------|-------|
| 1   | ITX-B110_C316L VER:1.1(6305)   | 6305      | 1.8G      | 2*SODDR4 | 1   | 1    | 2ch/24Bit | 1   | 2*I225V | 8   | 6   | COM2/3  | DC12V |
| 2   | ITX-B110_I526L VER:1.1(1135G7) | I5-1135G7 | 2.4G      | 2*SODDR4 | 1   | 1    | 2ch/24Bit | 1   | 2*I225V | 8   | 6   | COM2/3  | DC12V |
| 3   | ITX-B110_I512L VER:1.1(1135G7) | I5-1135G7 | 2.4G      | 2*SODDR4 | 1   | 1    | 2ch/24Bit | 1   | 2*I225V | 8   | 2   | COM2    | DC12V |
| 4   | ITX-B110_I726L VER:1.1(1165G7) | I7-1165G7 | 2.8G      | 2*SODDR4 | 1   | 1    | 2ch/24Bit | 1   | 2*I225V | 8   | 6   | COM2/3  | DC12V |
| 5   | ITX-B110_I716L VER:1.1(1165G7) | I7-1165G7 | 2.8G      | 2*SODDR4 | 1   | 1    | 2ch/24Bit | 1   | 1*I225V | 8   | 6   | COM2/3  | DC12V |

Remark: CPU model may change according to the actual condition, the above order information is for reference only, for more details please contact: +86-755-89395385

## **Safety Instructions**

1. Please read this manual carefully before using this product.
2. Please put all unused/uninstalled boards and cards in anti-static bags.
3. Please first place your hands on grounding metal object for a while before you go to take out the board from its package, so as to release body electrostatic.
4. Please place the motherboard on a solid plane before using.
5. Please keep the Motherboard dry, heat sink slot is used for ventilation to avoid overheating of the components in the case, do not cover or plug this kind of opening slots.
6. Please first check the power voltage before connecting the motherboard to the power supply.
7. Please put the power cord in the place where it will not be trampled, and don't put any objects on the power cord.
8. Before you want to connect or unplug any equipment, please make sure all power cords are unplugged in advance.
9. In order to avoid the human body by electric shock or product damage, must turn off the ac power or unplug the ac power cord from the power outlet before Plugging the motherboard or reconfiguration.
10. Please note that all the attention and warnings mentioned in the manual.
11. To prevent any unnecessary damage to the products due to frequent power on/off, please wait at least 30 seconds to restart the unit after a shutdown.
12. If any unexpected problems happened during the operation, please seek help from professionals.
13. please do not put or keep the device in the environment that temperature is higher than 70°C, otherwise it will cause damage to the equipment.

Note: It may cause the danger of explosion if replace the battery improperly. Please use the same type of battery or the battery that manufacturer recommend.

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## **Chapter 1 Product Introduction**

### **1.1 Product Introduction**

ITX-B110 onboard with 11<sup>th</sup> Gen Intel® Tiger Lake 11th Celeron 6305 1.8GHz / Core i5-1135G7 / i7-1165G7, with super graphics processing capacity and application computing capacity. Support dual channel SODIMM DDR4 3200MHz, up to 64GB, integrated Intel® UHD Graphics, support VGA, HDMI, LVDS / EDP display, provide 1 or 2 Intel I225V Gigabit Ethernet, 2 or 6 COM port, support M.2 5G module, M.2 SSD / M.2 WIFI6.

ITX-B110 combines stable reliable industrial grade performance and intelligent digital multimedia player advantage, can be widely used for advertising, education, media player, LCD screen, traffic control, information system, financial equipment, vehicle, military, etc.

### **1.2 Product Specification**

#### **➤ Processor**

Onboard Intel® Tiger Lake 11th Celeron 630 5/ Core i5-1135G7 / i7-11165G7 processor, TDP 15W

Compatible with Intel®Tiger Lake-U Celeron Penium Core I3/I5/I7 processor

#### **➤ Chipset**

SOC

#### **➤ Memory**

2\* DDR4 SODIMM RAM slot, 3200MHz, up to 64GB

#### **➤ Display**

Integrated Intel® UHD Graphics, support DirectX12.1,OpenGL4.6, 4K/60Hz

1\* VGA, resolution up to 1920X1200@60Hz

1\* HDMI2.0, resolution up to 4096x2304@60Hz

1\*HDMI1.4, resolution up to 4096x2304@24Hz

1\* LVDS, support dual channel 24bit

Note: 1\* EDP optional, same pin port with LVDS, need change hardware

LVDS screen voltage can support 12V, default 3.3V

Before using LVDS, please must check the LCD's working voltage to make setting

➤ LAN

1\* Intel I225V Gigabit Ethernet, support Wake On LAN / PXE

Note: LAN2 / USB1 optional, can change to 2\*LAN

➤ Audio

Onboard ALC888S 7.1+2 channel high fidelity audio controller, support MIC/Line-out. Amplifier

Support 2Ω/3W dual channel

➤ Expansion

1\* M.2 slot, support M.2 Key E WIFI6 module

1\* M.2 slot, support M.2 Key B 5G module

➤ Storage

1\* 7pin SATA3.0 port, transfer rate up to 6Gbps

1\* M.2 slot, support M.22260/2280 PCIE X1 /SATA SSD, auto detect

➤ Rear I/O Port

2\* USB3.0, 2\* USB2.0

1\* HDMI2.0

1\* VGA

1\* RJ45 Gigabit LAN port (LAN2 / USB1 optional, can change to 2\*LAN)

1\* Line-out (green), 1\* MIC (red)

1\* DC12V power connector, support 12V power input output

➤ Internal I/O Port

1\* JVGA1 port, 1\*12pin (same signal with DB15)

1\* JHDMI port, 2\*10pin

1\* LVDS port, 2\*15pin, support dual channel 24bit. (1\* EDP optional)

1\* LVDS backlight power supply port, 1\*6pin

1\* Screen dimming function port, 1\*4pin

6\* RS232 COM port, COM1 support the 9<sup>th</sup> pin charged function, COM2/3 support

RS485/422

1\* PS/2 KB/MS port, (red), 1\*6Pin

4\* USB2.0 port, 2\*5pin, USB1 / F\_USB3 optional; for 2\*LAN, internal 6\*USB2.0

1\* Front audio port, 2\*5pin

1\* Front panel power button and LED indicator port, 2\*5Pin

1\* SATA power supply port, 1\*4pin

1\* Amplifier port, 1\*4pin

1\* 4pin power connector (support 12V input output)

1\* SIM slot

➤ GPIO

Support 4-in 4-out GPIO

➤ Cooling System

1\*4pin CPU smart fan connector, 1\* 4pin system fan connector

➤ BIOS

128Mb Flash ROM

➤ Watchdog

Support hardware reset function (L256, 0~255 seconds)

➤ Power Type

Adopt DC 12V power supply

➤ OS Support

Windows 10 / Linux



**Note:** This motherboard install EFI WIN10 OS, cannot copy the OS to use on other motherboard

➤ Dimension、Environment

Dimension: 170mm x 170mm

Working Temp.: -10℃~60℃

Working Humidity: 5~95% relative humidity, non-condensing

Storage Temp.: -20℃~70℃

➤ Product Photo:

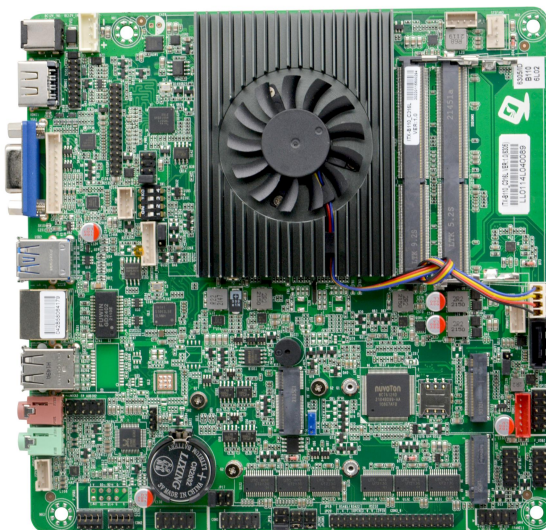


Image 1: ITX-B110 VER:1.1 Front View

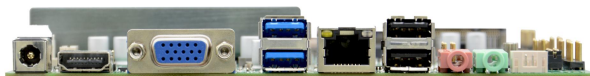


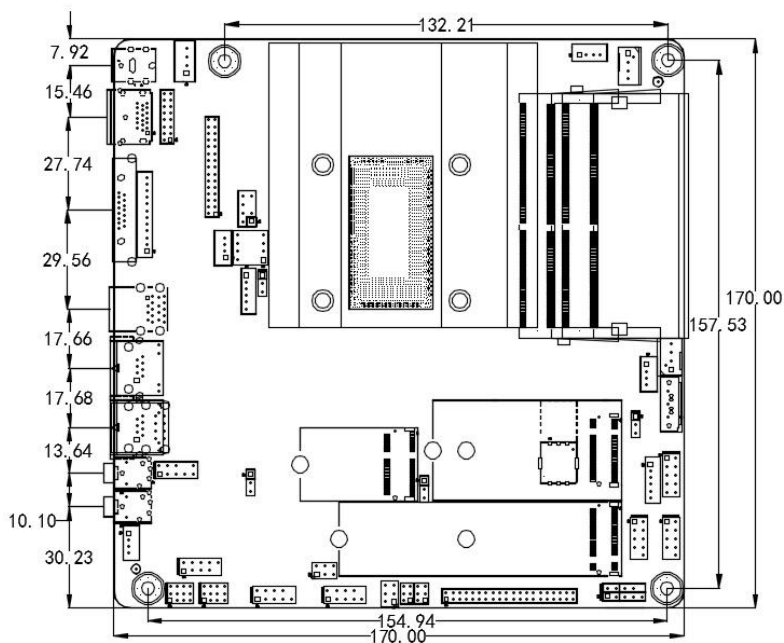
Image 2: ITX-B110 VER:1.1 I/O View

## Chapter 2 Installation Instruction

### 2.1 Motherboard Dimension

Following image is ITX-B100 front I/O port schematic diagram and dimension drawing. Please must be careful during installation, for some parts, wrong installation may lead to working abnormal.

**Note:** Please wear anti-electrostatic glove during installation, static electricity may cause damage to components.



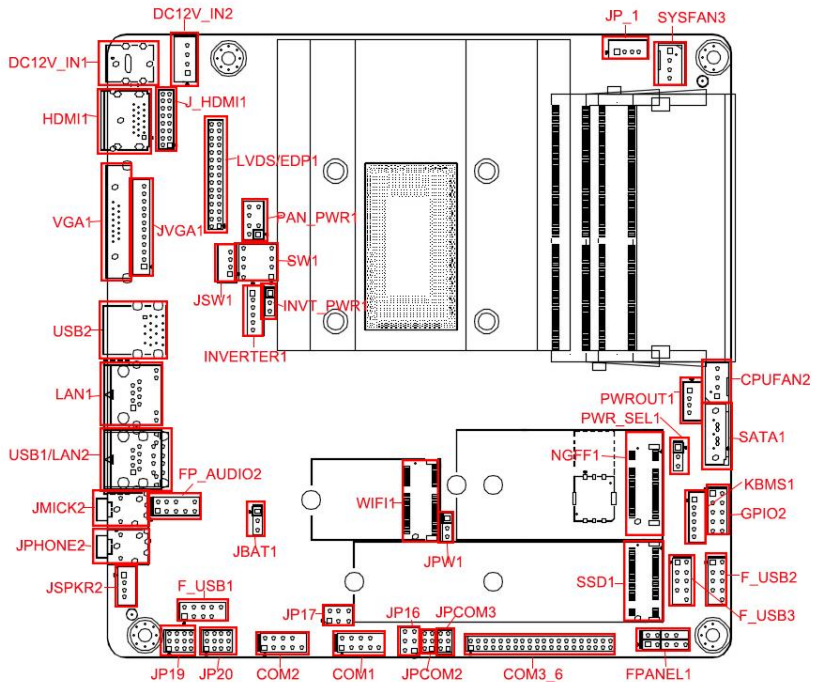
ITX-B110 VER:1.1 Dimension Drawing

#### Tips:

1. Please must use suitable screws and right installation method, otherwise may bring damage to motherboard.
2. How to identify the 1st pin of jumpers and connectors, check the word mark beside the socket, It would be marked with "1" or bold lines or triangular symbols; check the solder pad on the back, the square pan denotes the 1<sup>st</sup> pin. When connecting external devices or cables, please pay attention to distinguish the 1<sup>st</sup>

pin, otherwise may cause damage to the motherboard.

## 2.2 Interface Schematic Diagram



ITX-B110 I/O Port Schematic Diagram

### Tips:

LVDS screen working voltage support 3.3V、5V、12V selectable by jumper, defaulted as 3.3V. Before using LVDS please must learn the LCD's required rated working voltage.

### Tips:

How to identify the alarms:(Long beep indicates system memory error; Short beep indicates the computer is power on).

## **2.3 Installation Steps**

Please follow below steps to assemble your computer:

1. Please refer to the manual to adjust all jumpers on ITX-B810 correctly.
2. Install other expansion cards.
3. Connect all signal cable, power cables, panel control circuit and power supply.
4. Power on computer, complete BIOS program setting



**All key components of this motherboard are integrated circuit and these components could be easily damaged by electrostatic influence. So, before installing motherboard, please always keep following precautions in mind:**

1. Hold the board by edge, don't touch any components or the pin of plug & Socket.
2. Wear anti-static gloves/wrist strap while touching the integrated circuit components, such as CPU, RAM etc.
3. Before the integrated circuit components are installed, place the components in an anti-static mat or anti-static bag.
4. After confirming that the power switch is in the off position, plug in the power plug.

## **2.4 Memory Installation**

The board provide 2\* SO-DIMM DDR4 slot, please note the following two points when installing the memory card:

1. please align the notch of the memory bank with the alignment mark on the socket and press the memory bank firmly into the socket.
2. Please choose the proper memory bank that matches the motherboard.

## **2.5 Jumper Function Settings**

Please refer to following instructions to adjust jumper setting before installing hardware devices.

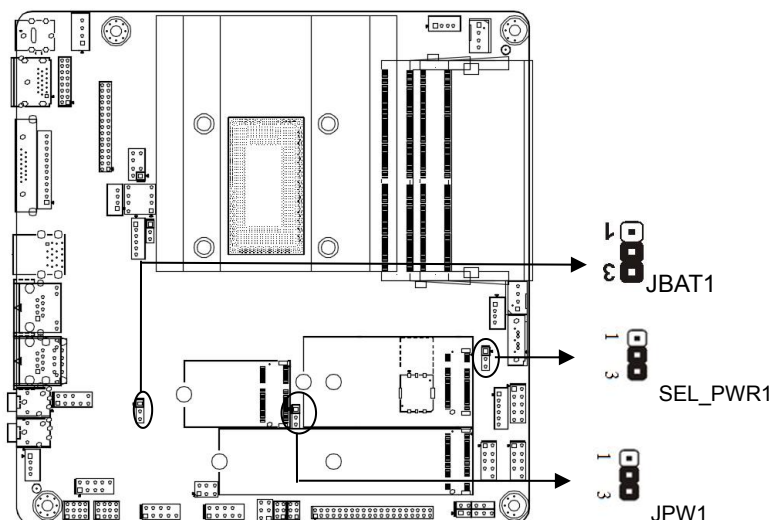
**Tips:** How to identify the 1st pin of jumpers and connectors, check the word mark beside the socket, It marked with "1" or bold lines or triangular symbols. Check the bonding pad on the back of PCB, the square bonding pad is PIN 1; All the jumpers' PIN1 have a white arrow on the side.

### **2.5.1 CMOS Clear/ Hold Jumper Settings (JBAT1)**

CMOS is powered by onboard button cell. Clear CMOS may lead to permanent

elimination of previous system settings and make the system back to the original settings (factory setting).

- Steps:
- (1) Power off computer, unplug power supply.
  - (2) Use jumper cap short circuit “JBAT1” pin 2-3 5 to 6 seconds, then put back to defaulted setting pin 1-2 shorted;
  - (3) Power on computer and press “Delete” to enter BIOS setup interface.
  - (4) Press “F9” ---- “Enter” then reload optimal defaults.
  - (5) Press “F10” , Save and Exit.



## JBAT1 Definition:

| Setting   | JBAT1   |
|-----------|---|
| 1-2 Short | Normal working status                                 |
| 2-3 Short | Clear CMOS, all BIOS settings back to factory setting |

**⚠ Do not clear COMS when motherboard is connected to electricity, in case cause damage to motherboard !**

## 2.5.2 JPW1 Jumper Setting

### JPW1 Definition:


| Setting   | JPW1                  |
|-----------|-----------------------|
| 1-2 Short | Disable Auto Power On |
| 2-3 Short | Enable Auto Power On  |

2.5.3 4G Module Voltage Setting (PWR\_SEL1)

PWR\_SEL1 Definition:

| Setting   | PWR_SEL1 |
|-----------|----------|
| 1-2 Short | 3.3V     |
| 2-3 Short | 3.8V     |

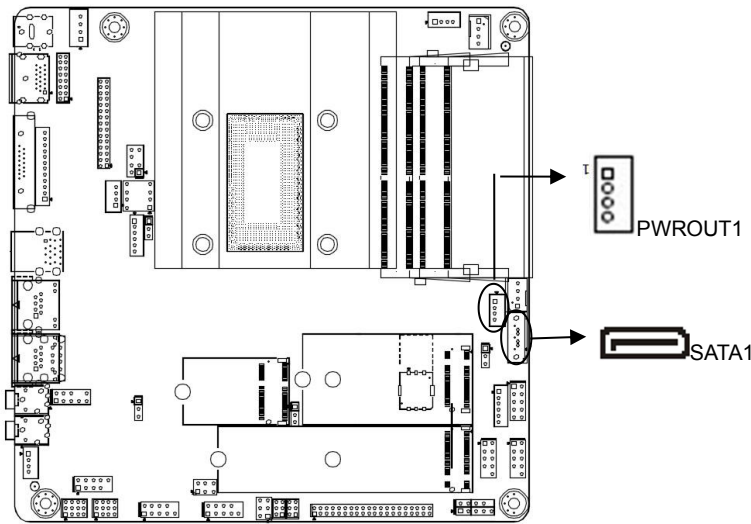
2.6 Interface Description

 Please read the following instructions carefully before connecting external devices in case cause damage to the motherboard.

2.6.1 SATA Port (SATA1、PWROUT1)

Internal provide 1\* 7 Pin SATA3.0 port, transfer speed up to 6Gbps.

Internal provide 1\* 4Pin hard disk power supply port (PWROUT1).



SATA1 Definition

| Pin | Signal Name |
|-----|-------------|
|-----|-------------|

PWROUT1 Definition

| Pin | Signal Name |
|-----|-------------|
|-----|-------------|

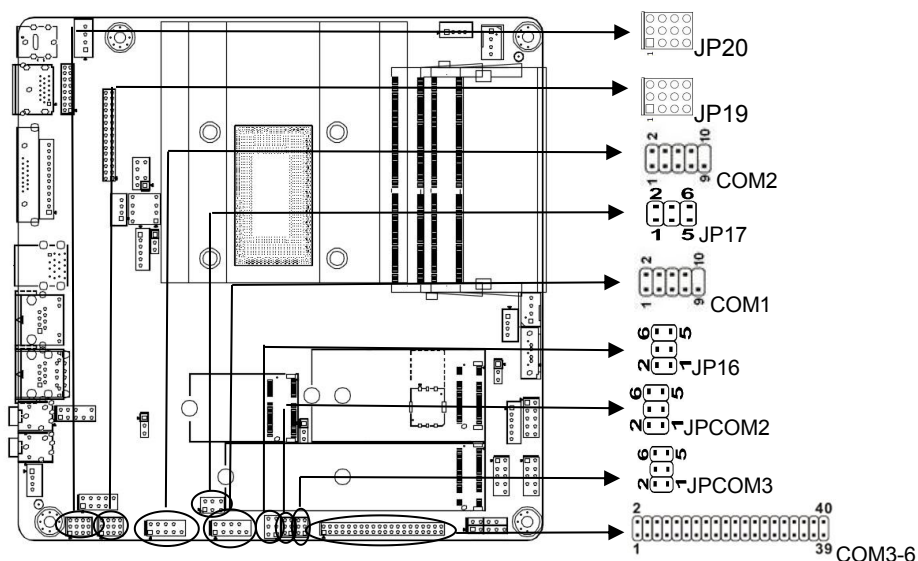
|   |          |
|---|----------|
| 1 | GND      |
| 2 | SATA_TXP |
| 3 | SATA_TXN |
| 4 | GND      |
| 5 | SATA_RXN |
| 6 | SATA_RXP |
| 7 | GND      |

|   |      |
|---|------|
| 1 | +12V |
| 2 | GND  |
| 3 | GND  |
| 4 | +5V  |

Tips: 1. SATA power supply port PWROUT1 pin 1 is +12V output, pin4 is +5V output, please use our company standard power cable, in case burn the hard disk.

### 2.6.2 COM Port (COM1、COM2、COM3-6、JP16、JP17、JP19、JP20、JPCOM2、JPCOM3)

The board provide up to 6\* RS232 COM port, COM1/COM2 is 2\*5pin, COM3-6 is 2\*20pin. The COM ports can be enabled or disabled in the BIOS settings, can also choose to interrupt the IRQ and I/O addresses. COM1, COM2 support the 9th pin charged function, COM2/3 support RS485/422, detail setting please refer to JP16, JP17, JP19, JP20, JPCOM2, JPCOM3 jumper setting



**COM1、COM2 Definition:**

| Pin | Signal Name | Pin | Signal Name |
|-----|-------------|-----|-------------|
| 1   | DCD         | 2   | RXD         |
| 3   | TXD         | 4   | DTR         |
| 5   | GND         | 6   | DSR         |
| 7   | RTS         | 8   | CTS         |
| 9   | RI          | 10  | NC          |

**COM3-6 Definition:**

| Pin | Signal Name | Pin | Signal Name |
|-----|-------------|-----|-------------|
| 1   | COM3_DCD    | 2   | COM3_RXD    |
| 3   | COM3_TXD    | 4   | COM3_DTR    |
| 5   | GND         | 6   | COM3_DSR    |
| 7   | COM3_RTS    | 8   | COM3_CTS    |
| 9   | COM3-RI     | 10  | NC          |
| 11  | COM4_DCD    | 12  | COM4_RXD    |
| 13  | COM4_TXD    | 14  | COM4_DTR    |
| 15  | GND         | 16  | COM4_DSR    |
| 17  | COM4_RTS    | 18  | COM4_CTS    |
| 19  | COM4-RI     | 20  | NC          |
| 21  | COM5_DCD    | 22  | COM5_RXD    |
| 23  | COM5_TXD    | 24  | COM5_DTR    |
| 25  | GND         | 26  | COM5_DSR    |
| 27  | COM5_RTS    | 28  | COM5_CTS    |
| 29  | COM5-RI     | 30  | NC          |
| 31  | COM6_DCD    | 32  | COM6_RXD    |
| 33  | COM6_TXD    | 34  | COM6_DTR    |
| 35  | GND         | 36  | COM6_DSR    |
| 37  | COM6_RTS    | 38  | COM6_CTS    |
| 39  | COM6-RI     | 40  | NC          |

**JP16 Setting:**

| Setting | Function (JP16) |
|---------|-----------------|
|---------|-----------------|



|           |       |      |
|-----------|-------|------|
| 1-2 Short | RS232 | COM1 |
| 3-4 Short | +5V   |      |
| 5-6 Short | +12V  |      |

**JP17 Setting:**

| Setting   | Function (JP17) |      |
|-----------|-----------------|------|
| 1-2 Short | RS232           | COM2 |
| 3-4 Short | +5V             |      |
| 5-6 Short | +12V            |      |

**JP19 (COM2 RS485/422)Setting:**

| Setting                 | COM2      |
|-------------------------|-----------|
| 2-3,5-6,8-9,11-12 Short | RS232     |
| 1-2,4-5,7-8,10-11 Short | RS485/422 |

**JP20 (COM3 RS485/422)Setting:**

| Setting                 | COM3      |
|-------------------------|-----------|
| 2-3,5-6,8-9,11-12 Short | RS232     |
| 1-2,4-5,7-8,10-11 Short | RS485/422 |

**JPCOM2 (COM2 RS485/422 Selection)**

| Setting   | COM2  |
|-----------|-------|
| 1-2 Short | RS232 |
| 3-4 Short | RS485 |
| 5-6 Short | RS422 |

**JPCOM3 (COM3 RS485/422 Selection)**

| Setting   | COM3  |
|-----------|-------|
| 1-2 Short | RS232 |
| 3-4 Short | RS485 |
| 5-6 Short | RS422 |

**COM2/3 RS485 Definition:**

| Pin | Signal Name | Pin | Signal Name |
|-----|-------------|-----|-------------|
| 1   | DATA+       | 2   | DATA-       |
| 3   | NC          | 4   | NC          |

|   |     |    |    |
|---|-----|----|----|
| 5 | GND | 6  | NC |
| 7 | NC  | 8  | NC |
| 9 | NC  | 10 | NC |

**COM2/3 RS422 Definition:**

| Pin | Signal Name | Pin | Signal Name |
|-----|-------------|-----|-------------|
| 1   | T/R+        | 2   | T/R-        |
| 3   | RXD+        | 4   | RXD-        |
| 5   | GND         | 6   | NC          |
| 7   | NC          | 8   | NC          |
| 9   | NC          | 10  | NC          |

**2.6.3 Display Port (VGA1、JVGA1、HDMI1、J\_HDMI1、LVDS/EDP1、INVERTER1、INVT\_PWR1、PAN\_PWR1、JSW1、SW1)**

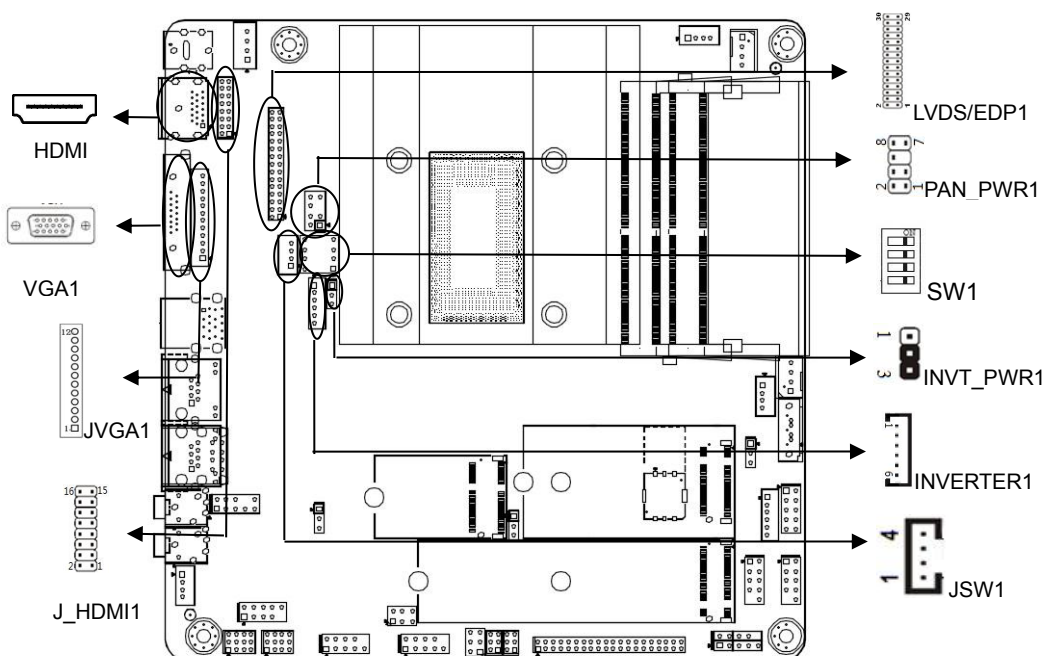
The board external provide 1\* VGA port, 1\* HDMI port

Internal provide 1\* JVGA port, 1\*12pin; 1\*JHDMI port, 2\*8pin;

1\*LVDS port, support dual channel 24bit, 1\*Embedded Display port

**Note:** VGA1 / JVGA1 same signal

LVDS / EDP same pin port, need change hardware (default LVDS)



### VGA1 Definition:

| Pin | Signal Name | Pin | Signal Name |
|-----|-------------|-----|-------------|
| 1   | Red         | 2   | Green       |
| 3   | Blue        | 4   | NC          |
| 5   | GND         | 6   | GND         |
| 7   | GND         | 8   | GND         |
| 9   | NC          | 10  | GND         |
| 11  | NC          | 12  | DDCDATA     |
| 13  | HSYNC       | 14  | VSYN        |
| 15  | DDCCLK      |     |             |

### J\_VGA1 Definition:

| Pin | Signal Name | Pin | Signal Name |
|-----|-------------|-----|-------------|
| 1   | NC          | 2   | VSYN        |
| 3   | HSYNC       | 4   | GND         |
| 5   | R           | 6   | GND         |

|    |         |    |         |
|----|---------|----|---------|
| 7  | G       | 8  | GND     |
| 9  | B       | 10 | GND     |
| 11 | DDC_SDA | 12 | DDC_SCL |

**HDMI1 Definition**

| Pin | Signal Name       | Pin | Signal Name       |
|-----|-------------------|-----|-------------------|
| 1   | TMDS Data2+       | 2   | TMDS Data2 Shield |
| 3   | TMDS Data2-       | 4   | TMDS Data1+       |
| 5   | TMDS Data1 Shield | 6   | TMDS Data1-       |
| 7   | TMDS Data0+       | 8   | TMDS Data0 Shield |
| 9   | TMDS Data0-       | 10  | TMDS Clock+       |
| 11  | TMDS Clock Shield | 12  | TMDS Clock-       |
| 13  | Reserved (N.C.)   | 14  | Reserved (N.C.)   |
| 15  | SCL               | 16  | SDA               |
| 17  | CEC Ground        | 18  | +5V Power         |
| 19  | Hot Plug Detect   |     |                   |

**J\_HDMI1 Definition:**

| Pin | Signal Name | Pin | Signal Name     |
|-----|-------------|-----|-----------------|
| 1   | TMDS Data2+ | 2   | SCL             |
| 3   | TMDS Data2- | 4   | SDA             |
| 5   | TMDS Data1+ | 6   | NC              |
| 7   | TMDS Data1- | 8   | Hot Plug Detect |
| 9   | TMDS Data0+ | 10  | +5V Power       |
| 11  | TMDS Data0- | 12  | GND             |
| 13  | TMDS Clock+ | 14  | GND             |
| 15  | TMDS Clock- | 16  | GND             |

**EDP1 Definition:**

| Pin | Signal Name | Pin | Signal Name |
|-----|-------------|-----|-------------|
| 1   | PVDD        | 2   | PVDD        |
| 3   | PVDD        | 4   | HPD         |
| 5   | GND         | 6   | GND         |
| 7   | EDP_TX0-    | 8   | EDP_TX0+    |

|    |          |    |          |
|----|----------|----|----------|
| 9  | EDP_TX1- | 10 | EDP_TX1+ |
| 11 | NC       | 12 | NC       |
| 13 | GND      | 14 | GND      |
| 15 | EDP_AUX- | 16 | EDP_AUX+ |
| 17 | NC       | 18 | NC       |
| 19 | NC       | 20 | NC       |
| 21 | NC       | 22 | NC       |
| 23 | NC       | 24 | NC       |
| 25 | GND      | 26 | GND      |
| 27 | NC       | 28 | NC       |
| 29 | NC       | 30 | NC       |

**LVDS1 Definition:**

| Pin | Signal Name | Pin | Signal Name |
|-----|-------------|-----|-------------|
| 1   | LCDVDD      | 2   | LCDVDD      |
| 3   | LCDVDD      | 4   | NC          |
| 5   | GND         | 6   | GND         |
| 7   | LVDS_A0-    | 8   | LVDS_A0+    |
| 9   | LVDS_A1-    | 10  | LVDS_A1+    |
| 11  | LVDS_A2-    | 12  | LVDS_A2+    |
| 13  | GND         | 14  | GND         |
| 15  | LVDSA_CLK-  | 16  | LVDSA_CLK+  |
| 17  | LVDS_A3-    | 18  | LVDS_A3+    |
| 19  | LVDS_B0-    | 20  | LVDS_B0+    |
| 21  | LVDS_B1-    | 22  | LVDS_B1+    |
| 23  | LVDS_B2-    | 24  | LVDS_B2+    |
| 25  | GND         | 26  | GND         |
| 27  | LVDSB_CLK-  | 28  | LVDSB_CLK+  |
| 29  | LVDS_B3-    | 30  | LVDS_B3+    |

Screen voltage can be different for different LCD, the board provide 3.3V,5V,12V three types screen working voltage selection and 5V/12V screen backlight power supply voltage selection. Before using LVDS, please learn about the required rated

voltage. When the selected LCD voltage same with the LCD screen voltage, LCD screen can be displayed normally. Settings as follows:

**INVERTER1(Backlight Power Supply Port) Definition:**

| Pin | Signal Name               |
|-----|---------------------------|
| 1   | 12V/5V (INV_PWR1Setting)  |
| 2   | 12V/5V (INV_PWR1Setting)  |
| 3   | backlight enable          |
| 4   | backlight dimming control |
| 5   | GND                       |
| 6   | GND                       |

**INV\_PWR1(Screen Backlight Power Supply)Setting:**

| Setting   | INVT_PWR1 |
|-----------|-----------|
| 1-2 Short | 12V       |
| 2-3 Short | 5V        |

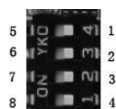
**PAN\_PWR1(Screen Working Voltage)Setting:**

| Setting   | PAN_PWR1 |
|-----------|----------|
| 1-2 Short | 3.3V     |
| 3-4 Short | 5V       |
| 5-6 Short | NC       |
| 7-8 Short | 12V      |

**JSW1(Screen Dimming Control) Definition:**

| Pin | Signal Name |
|-----|-------------|
| 1   | BLUP        |
| 2   | BLDN        |
| 3   | BKLT-       |
| 4   | GND         |

**SW1 is used for setting LVDS resolution, details settings as below:**



SW1 switch image:

1、2、3、4 represents 1, 5、6、7、8 represents 0.



For example: 1、0011 switch locations is: 5634,



2、0101 switch locations is: 5274,



3、1010 switch locations is: 1638,

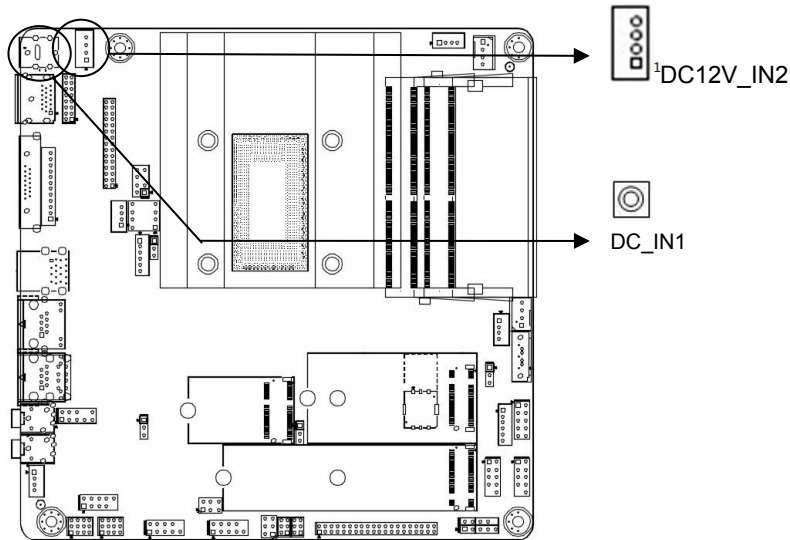


4、Factory defaulted switch locations is 1234, that is 1111

| Switch [4:1] | HA (Pixel) | VA (line) | RR (Hz) | PC (MHz) | CD (bit) | Port              | HB (Pixel) | HSO (Pixel) | HSPW (Pixel) | VB (line) | VSO (line) | VSPW (line) |
|--------------|------------|-----------|---------|----------|----------|-------------------|------------|-------------|--------------|-----------|------------|-------------|
| 0000         | 800        | 600       | 60      | 38.25    | 6        | Single            | 224        | 32          | 80           | 24        | 3          | 4           |
| 0001         | 1024       | 768       | 60      | 56.00    | 6        | Single            | 160        | 48          | 32           | 22        | 3          | 4           |
| 0010         | 1280       | 768       | 60      | 68.25    | 6        | Single            | 160        | 48          | 32           | 22        | 3          | 7           |
| 0011         | 1280       | 800       | 60      | 71.00    | 6        | Single            | 160        | 48          | 32           | 23        | 3          | 6           |
| 0100         | 1280       | 960       | 60      | 85.25    | 6        | Single            | 160        | 48          | 32           | 28        | 3          | 4           |
| 0101         | 1280       | 1024      | 60      | 91.00    | 8        | Dual              | 160        | 48          | 32           | 30        | 3          | 7           |
| 0110         | 1366       | 768       | 60      | 72.75    | 6        | Single            | 160        | 48          | 32           | 23        | 3          | 10          |
| 0111         | 1366       | 768       | 60      | 72.25    | 8        | Single            | 160        | 48          | 32           | 23        | 3          | 10          |
| 1000         | 1440       | 900       | 60      | 106.50   | 8        | Dual              | 464        | 80          | 152          | 34        | 3          | 6           |
| 1001         | 1024       | 600       | 60      | 56.00    | 6        | Single            | 160        | 48          | 32           | 22        | 3          | 4           |
| 1010         | 1920       | 1080      | 60      | 138.50   | 6        | Dual<br>15.6 inch | 160        | 48          | 32           | 31        | 3          | 5           |
| 1011         | 1920       | 1080      | 60      | 138.50   | 8        | Dual<br>21.5 inch | 160        | 48          | 32           | 31        | 3          | 5           |
| 1100         | 1920       | 1080      | 60      | 138.50   | 8        | Dual<br>42 inch   | 160        | 48          | 32           | 31        | 3          | 5           |
| 1101         | 1920       | 1200      | 60      | 154.00   | 6        | Dual              | 280        | 48          | 32           | 35        | 3          | 6           |
| 1110         | 1920       | 1200      | 60      | 154.00   | 8        | Dual              | 280        | 48          | 32           | 35        | 3          | 6           |
| 1111         | 1024       | 768       | 60      | 56.00    | 8        | Single            | 160        | 48          | 32           | 22        | 3          | 4           |

**2.6.4 Power Supply (DC12V\_IN1、DC12V\_IN2)**

The board provide 1\*4pin power connector, support 12V input output  
1\* power adaptor port, support 12V input output



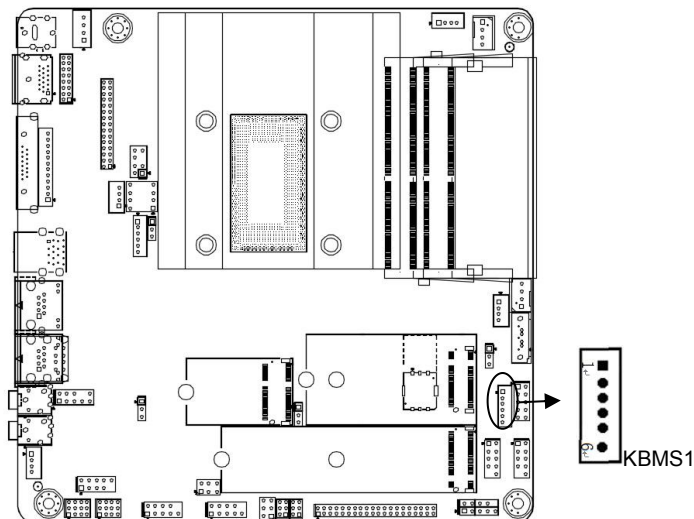
**DC12V\_IN2 Definition:**

| Pin | Signal Name |
|-----|-------------|
| 1   | 12V         |
| 2   | 12V         |
| 3   | GND         |
| 4   | GND         |



**2.6.5 KB/MS Port (KBMS1)**

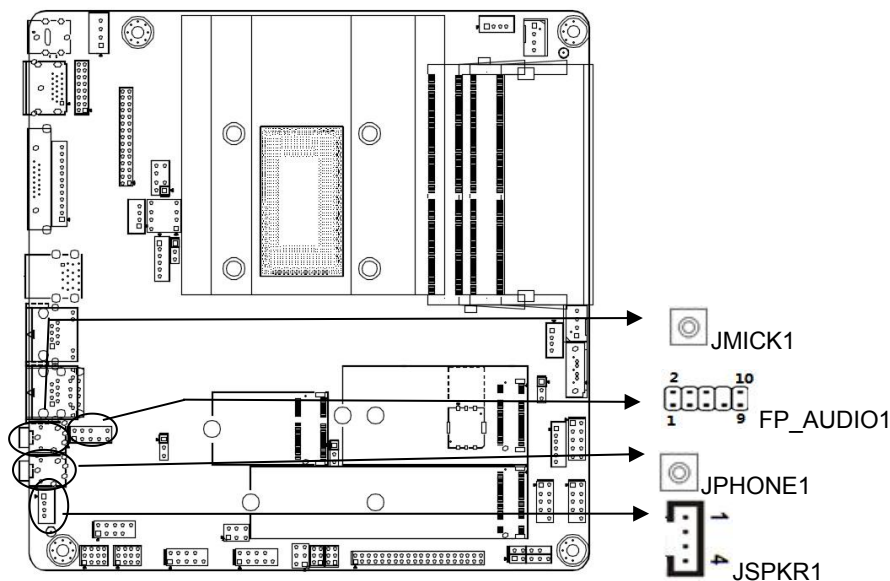
Board provide 1\*6pin KB/MS port (red color), need install PS/2 cable to use this port

**KBMS1 Port Definition:**

| Pin | Signal Name  |
|-----|--------------|
| 1   | +5V(standby) |
| 2   | KB_DT        |
| 3   | KB_CK        |
| 4   | MS_DT        |
| 5   | MS_CK        |
| 6   | GND          |

**2.6.6 Audio Port (JPHONE1、JMICK1、FP\_AUDIO1、JSPKR1)**

Board provide 1\* JPHONE1、JMICK1 standard audio port;  
Built-in a 2\*5pin front audio port, 1\*4pin power amplifier port.



**FP\_AUDIO1 (Front Panel Audio Port) Definition:**

| Pin | Signal Name | Pin | Signal Name   |
|-----|-------------|-----|---------------|
| 1   | MIC-L       | 2   | GND           |
| 3   | MIC-R       | 4   | NC            |
| 5   | Line out-R  | 6   | Sense Return1 |
| 7   | Sense-FB    | 8   | NC            |
| 9   | Line OUT-L  | 10  | Sense Return2 |

**JSPKR1(Amplifier Port) Definition:**

| Pin | Signal Name |
|-----|-------------|
| 1   | SPKR+       |
| 2   | SPKR-       |
| 3   | SPKL-       |
| 4   | SPKL+       |

## 2.6.7 USB Port (USB1、USB2、F\_USB1、F\_USB2、F\_USB3)

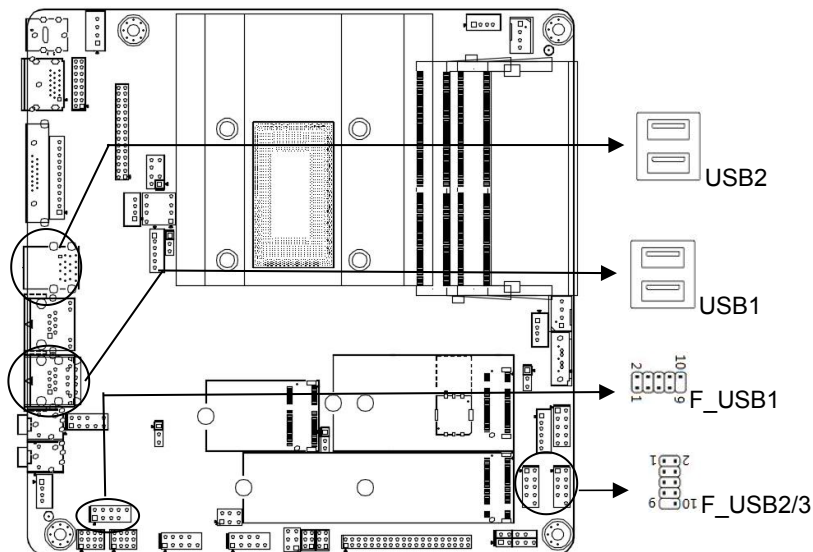
The board external provide 2\* USB3.0, 2\* USB2.0

Internal 6\*USB2.0 (2.54mm, 2\*5pin)

**Note:** USB1 / F\_USB1 optional, USB1 / LAN2 optional

For single LAN, external 4\*USB, internal 4\*USB2.0

For dual LAN, external 2\*USB, internal 6\*USB2.0



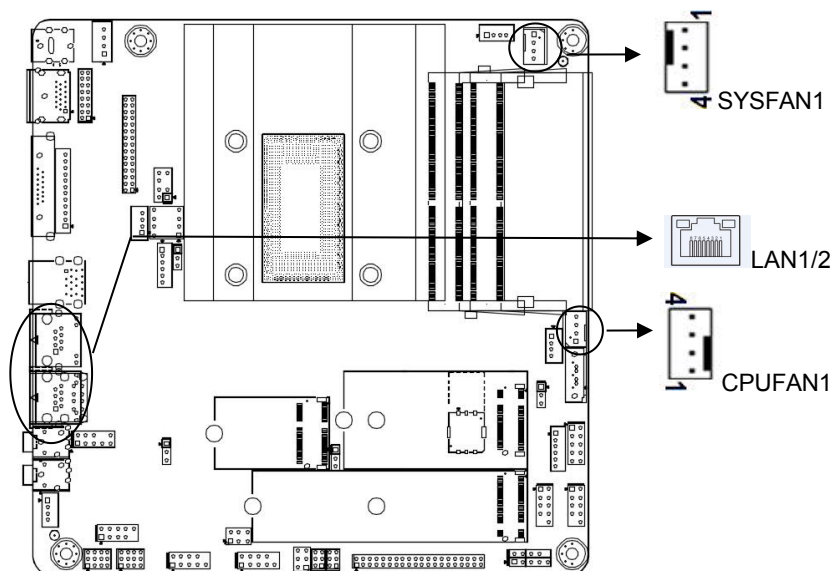
### F\_USB1、F\_USB2、F\_USB3 Definition:

| Pin | Signal Name | Pin | Signal Name |
|-----|-------------|-----|-------------|
| 1   | +5V         | 2   | +5V         |
| 3   | D0-         | 4   | D1-         |
| 5   | D0+         | 6   | D1+         |
| 7   | GND         | 8   | GND         |
| 9   |             | 10  | GND         |

## 2.6.8 LAN and Fan Connector (LAN1、LAN2、CPUFAN1、SYSFAN1)

Provide 2 \* standard Gigabit LAN port

Built-in 1\* 4pin CPU smart fan connector, 1\* 4pin system fan connector



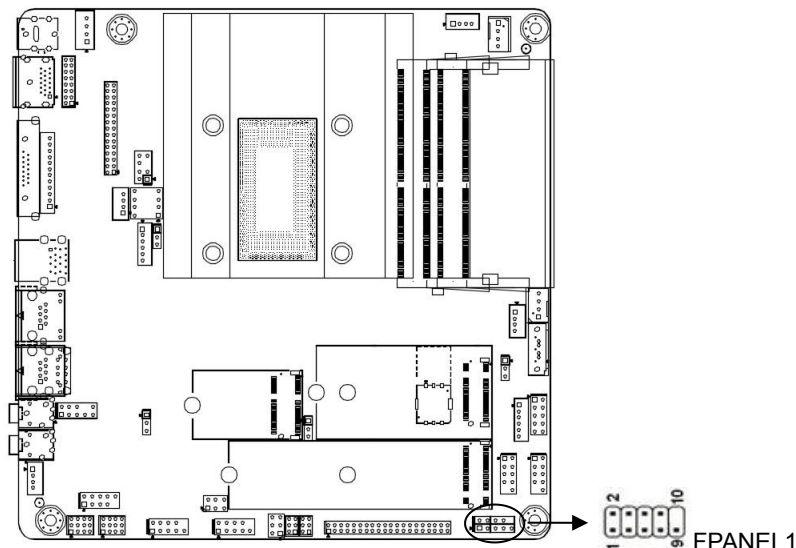
### CPUFAN1、SYSFAN1 Definition:

| Pin | Signal Name |
|-----|-------------|
| 1   | GND         |
| 2   | +12V        |
| 3   | DET         |
| 4   | PWM         |

**Remark:** DET: fan speed pulse output; PWM: fan speed PWM control

## 2.6.9 Front Panel Port (FPANEL1)

The board provide a 2\*5pin front panel pin port, used for connecting with front panel power button and LED indicator.



### FPANEL1 Definition:

| Pin | Signal Name | Pin | Signal Name |
|-----|-------------|-----|-------------|
| 1   | HDDLED+     | 2   | PWRLED+     |
| 3   | HDDLED-     | 4   | PWRLED-     |
| 5   | GND         | 6   | PWRBTN#     |
| 7   | RESETBTN#   | 8   | GND         |
| 9   | NC          | 10  |             |

(1) HDD LED (1, 3 are HDD LED pin, 1 pin is positive pole), when hard disk is in the operation of read and write, the LED will flash, means the hard drive is running.

(2) Power LED (2, 4 are POWER LED pin, 2 pin is positive pole), when the system connected to the power supply, Power LED on; when the system power supply cut off, power LED off.

(3) Reset button (5, 7), when system go wrong and cannot continue to work, click reset button can resume the system to work again.

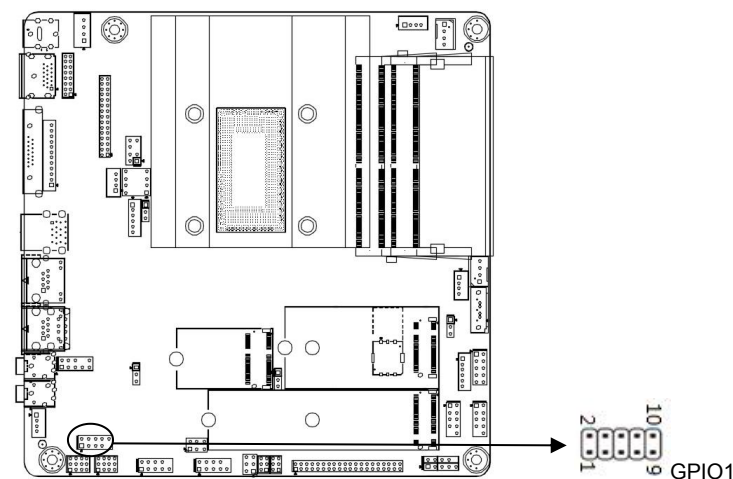
(4) Power button (6, 8), these two pins are used for connecting with power button

on the front panel of chassis, for connecting or cutting off power supply.

**2.6.10 Programmable Input Output Port (GPIO1)**

Please write GPIO driver program under OS (windows series please refer to the information of related Microsoft Driver; Linux, UNIX, please refer to the related Linux Driver framework model), use GPIO driver to drive GPIO module, the following is called a driver.

GPIO1 is combined with 5 group (10) pin (refer to motherboard), number 1, 2, 3, 4, 5, 6, 7, 8 pin port is Simple GPIO, 9 is GND, 10 is VCC, the singular number (1, 3, 5, 7) is signal input pin, even number (2, 4, 6, 8) is signal output pin:



**GPIO1 Definition:**

| Pin | Function | Default Value | Remark                 |
|-----|----------|---------------|------------------------|
| 1   | Input    | High          |                        |
| 2   | Output   | Low           | Depend on BIOS setting |
| 3   | Input    | High          |                        |
| 4   | Output   | Low           | Depend on BIOS setting |
| 5   | Input    | High          |                        |
| 6   | Output   | Low           | Depend on BIOS setting |
| 7   | Input    | High          |                        |
| 8   | Output   | Low           | Depend on BIOS setting |

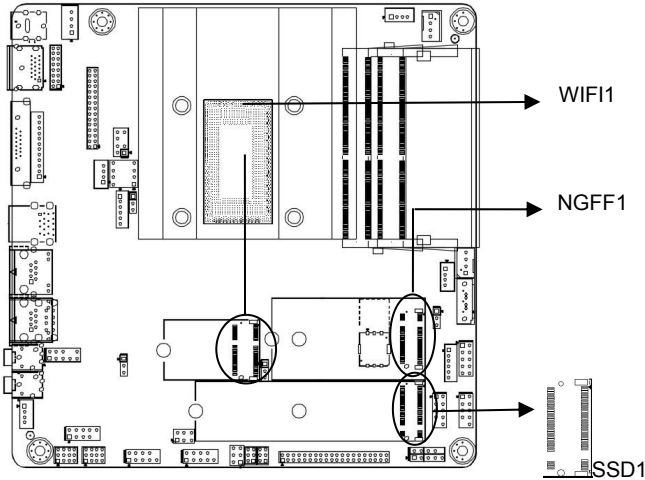
|    |     |  |  |
|----|-----|--|--|
| 9  | GND |  |  |
| 10 | +5V |  |  |

**2.6.11 Mini-PCIE Port (NGFF1、WIFI1、SSD1)**

Board internal provide 1\*M.2 slot, support M.2 Key B 5G module.

Internal provide 1\* M.2 slot, 1\*M.2 Key E WIFI6 module

Internal provide 1\* M.2 slot, support M.22260/2280 PCIE X1 /SATA SSD, auto detect



## **Chapter 3 BIOS Setting**

### **3.1. BIOS Description**

BIOS (Basic Input and Output System) , through CMOS chip on motherboard, it recorded parameter settings of each hardware of the system. BIOS contains the BIOS setup program, for users to set system parameters according to their own needs, to make the motherboard work normal or execute specific function.

Through BIOS setup program to modify the settings (except date and time), which are stored in the flash memory of system, the power required to memorize CMOS data are supplied by the battery on board, so when the system power off, the data will not lose, when next time re-open the power, system will read the set data. If needed to restore factory setting at the circumstance when cannot enter the Setup interface due to misconduct, please short circuit JBA12,3 pin to clear CMOS data.

Note! BIOS settings directly affect the performance of the computer, wrong set parameters will cause damage to the computer, or even cannot boot, please use the BIOS built-in default values to restore the normal operation of the system.

Due to the company's different product, the interface will be slightly different, the flowing image for reference only, it may be not exactly the same with your current using BIOS setup program.

### **3.2 BIOS Basic Function Setting**

#### **3.2.1 Enter Into BIOS Interface**

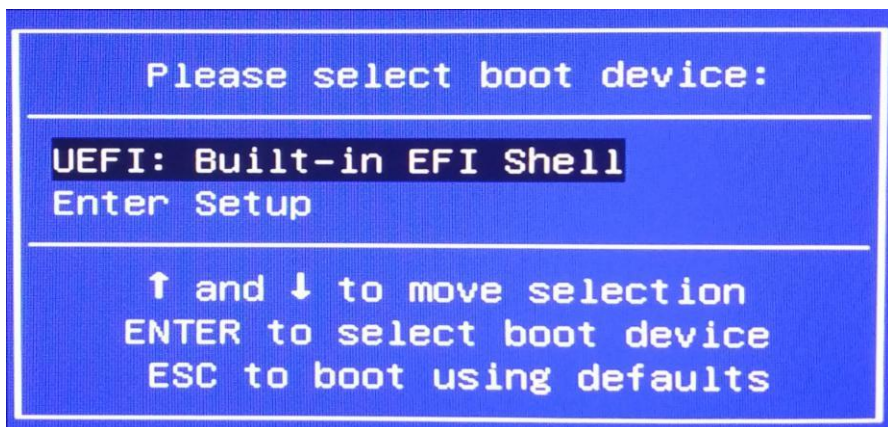
Following below steps to enter into BIOS interface

- 1、 Power on, the display screen will appear POST interface.
- 2、 When the screen displays click <DEL>or<ESC> to enter setup” tips, please click <DEL>or <ESC>, and you can enter the BIOS setup program
- 3、 Move the arrow key < ↑ >< ↓ >< ← >< → > to the options which you want to modify, click <Enter>, and you can enter the sub-screen of the option
- 4、 Use the arrow keys and the <Enter> key to modify the value of the selected items, click the Enter key to select BIOS option and modify.
- 5、 Use the <ESC> key to return to the last picture

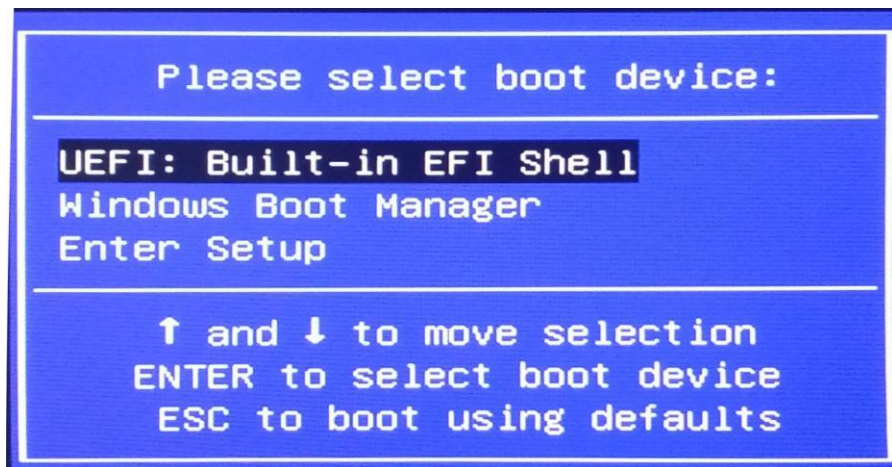


- 6、 <Page Up/+> Add numeric value or change  
<Page Down/-> Reduce numeric value or change  
<F1> Set sub menu help  
<F9> Set default values (optimize to factory settings)  
<F10> Save BIOS settings

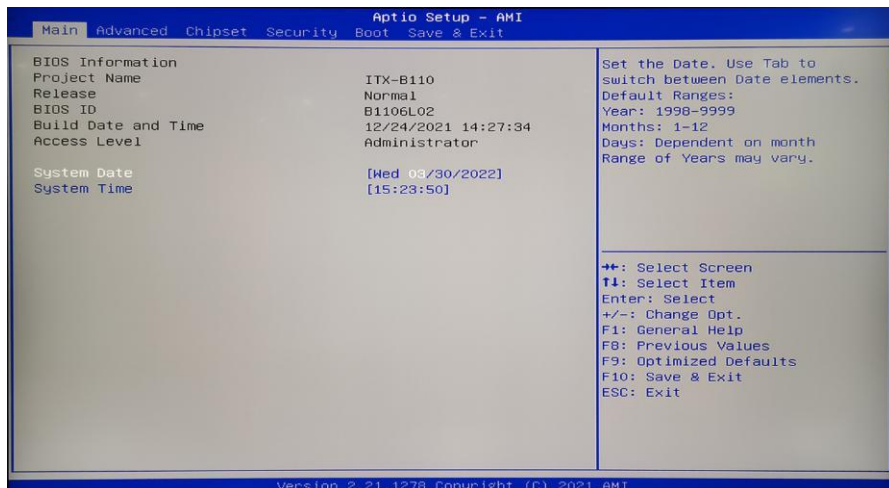
Note: 1、 For BIOS that support hard disk UEFI mode, cannot see hard disk information in BBS, but can see the connected hard disk information from SATA Config in BIOS, as below:



- 2、 After installing the UEFI system, can see the system boot information in the BBS.  
ex: Windows Boot Manager (hard disk information)



### 3.2.2 Main Menu (BIOS Information and Time/Date)



Bios ID :

Build Date and Time :

System Date :

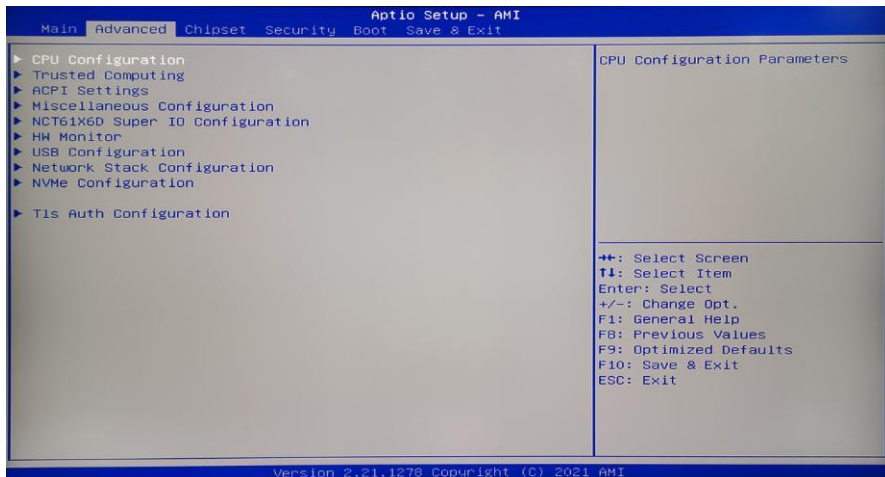
Set the current date. In the form of month / day / year. The setting range is:

Month (Jan.-Dec.), Date(01-31), Year(Max to 2099), Week(Mon.~Sun.).

System Time :

Set the current time, In the form of time/minute/second, the setting range is: Hour (00-23), Minute (00-59), Second (00-59).

### 3.2.3 Advance



CPU Configuration:

ACPI Settings: Advanced configuration and power management interface settings.

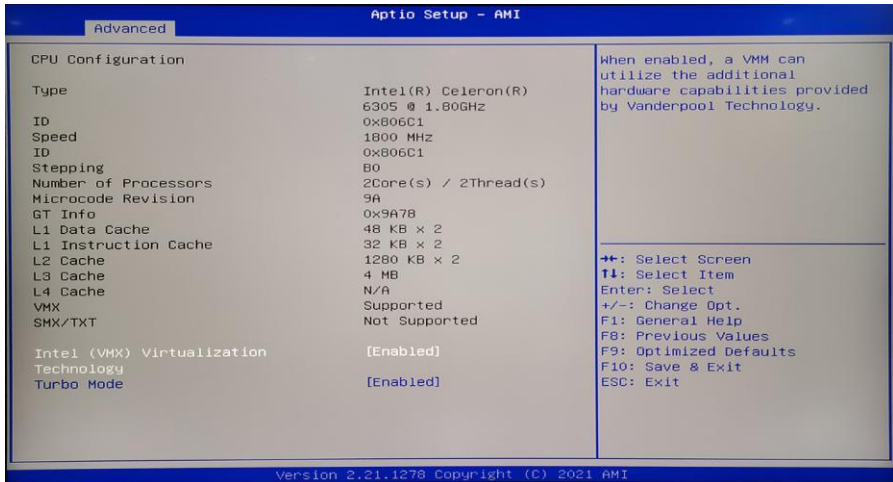
Miscellaneous Configuration: include timing start up, AC power loss (auto power on), etc

NCT61X6D Super IO Configuration: include COM port interrupt code and address setting.

HW Monitor: system monitoring, hardware monitoring, hardware monitor

USB Configuration:。

### 3.2.4 CPU Configuration

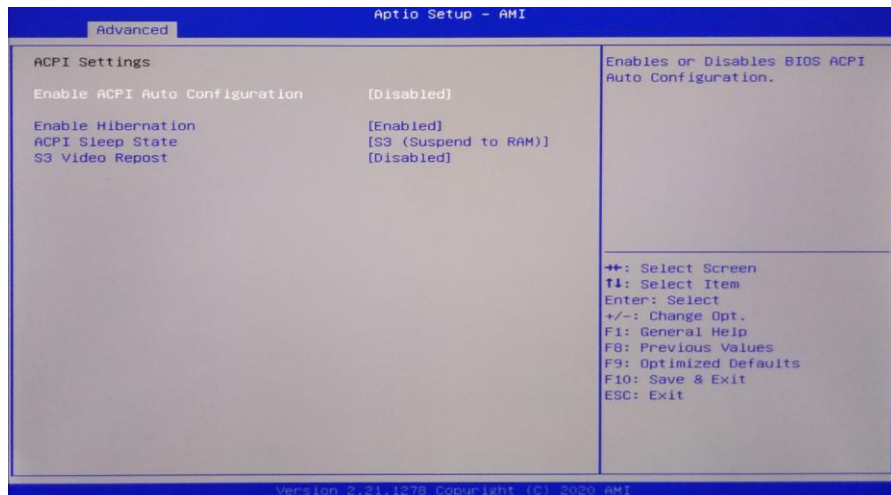


Read only items contain details of the CPU, including the CPU manufacturers, models, frequency, the first level cache size, the second level cache size and other information.

Intel Virtualization Technology :

Intel Virtualization Technology Is Intel's CPU in the system of virtual technology. It makes it possible to enable a PC running a plurality of OS, VT technology is in various types of processors, including dual core processor play very important role, this technique allows the processor with and / or virtualization technology, using Vanderpool technology, we can run two operating systems simultaneously on the same machine. In which a processor running an operating system, another processor running another operating system.

### 3.2.5 ACPI Settings



**Enable ACPI Auto Configuration** : This item is ACPI auto configuration, support (Enabled) or (Disabled) BIOS ACPI auto configuration, defaulted (Disabled) .

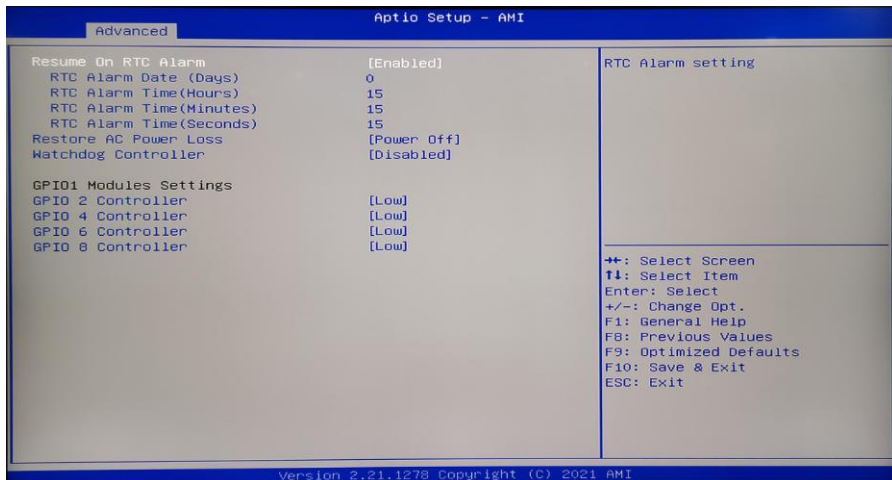
**Enable Hibernation**: Enabled or Disabled system sleep function ( OS/S4 sleep state). This option does not take effect under some OS. Default is (Enabled).

**ACPI Sleep State** : This item is used to select the power saving mode that the system enters during sleep, If the mode is different, the system power consumption will be different, Suspend Disabled: disable the sleep mode; S1(CPU Stop Clock): CPU stops working, other devices still supply power normally; S3(Suspend to Ram).

**Lock Legacy Resources** : Resource latch, (Enabled) or (Disabled) resource latch function.

**S3 Video Repost**: When waking up the S3/STR sleep mode, turn on the VGA BIOS POST function. The default is Disabled.

### 3.2.6 Miscellaneous Configuration



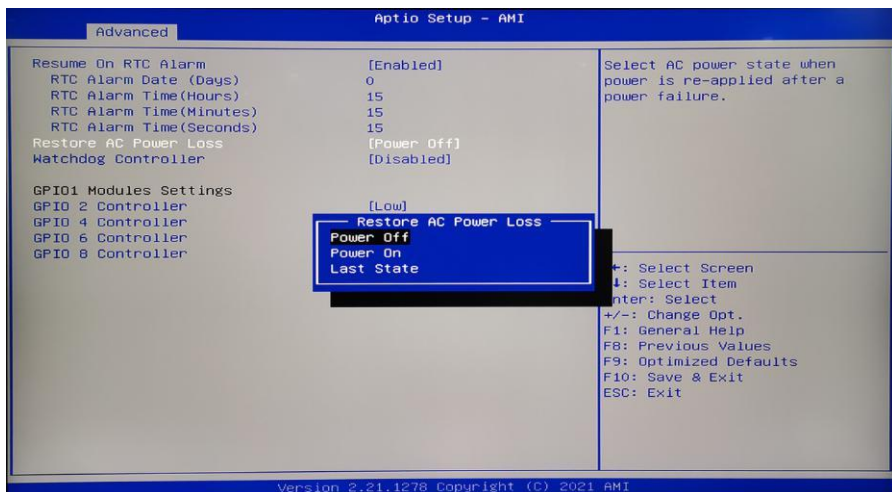
Resume On RTC Alarm: Set timing boot

RTC Alarm Date (Days): Set the scheduled auto power on date, "0" means every day

RTC Alarm Time (Hours): wake-up time unit in hours

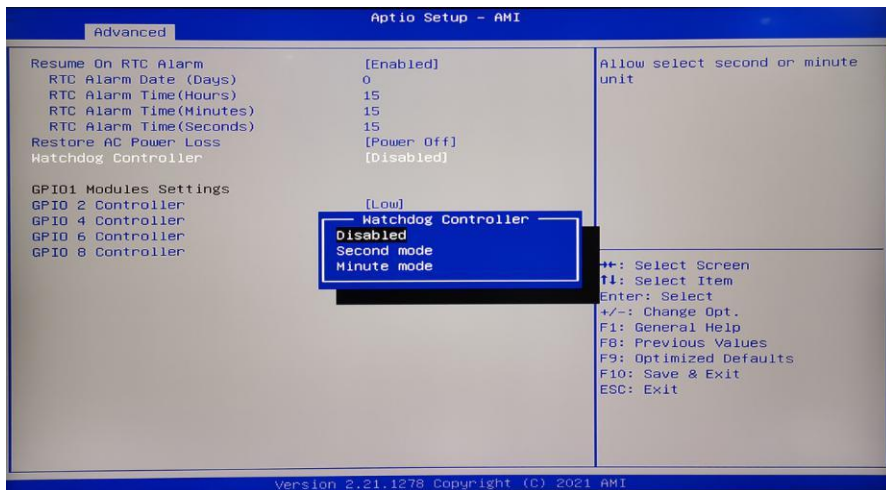
RTC Alarm Time (Minutes): wake-up time unit in minutes

RTC Alarm Time (Seconds): wake-up time unit in seconds.



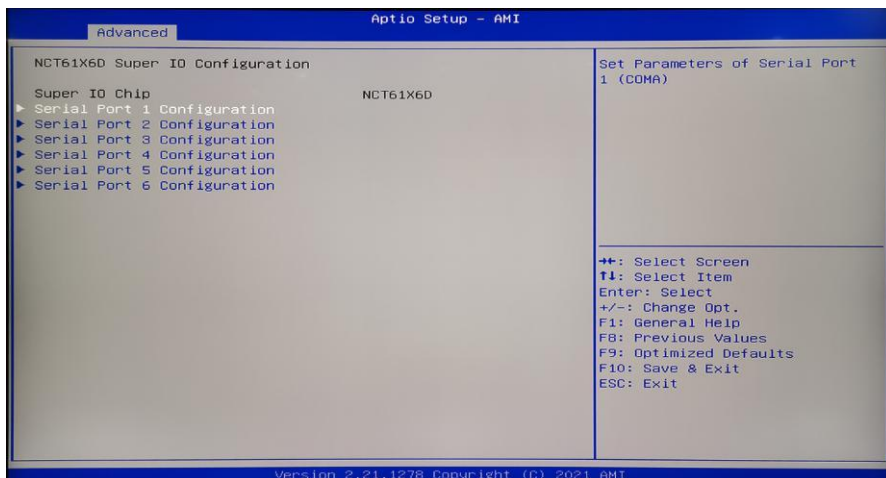
Restore AC Power Loss: option used to set the power on condition after connecting electric. Power Off: need to press power button to power on after connecting to

electric; Power On: Power on directly after connecting to electric; Last State: keep previous state after connecting to electric.



Watch dog Controller: [Disabled], [Second mode], [Minute Mode]

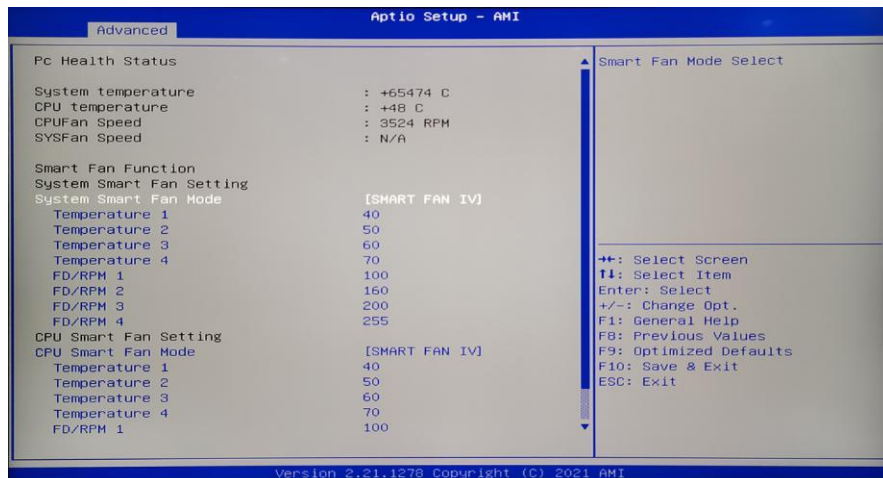
### 3.2.7 Super IO Configuration



Serial Port 1 Configuration: serial IO port setting, Super IO configuration, include COM port interrupt code and address setting.



### 3.2.8 PC Health Status



#### PC Health Status :

displays the current system temperature, CPU temperature, fan speed, and other relevant voltage value. The above parameters have a certain range, system cannot operate beyond the scope.

**Smart Fan 1 Mode:** This option is for whether or not open the CPU automatic fan control function, used to adjust CPU fan speed automatically according to the real-time detected CPU temperature, to achieve the purpose of saving energy.

Fan off temperature limit:

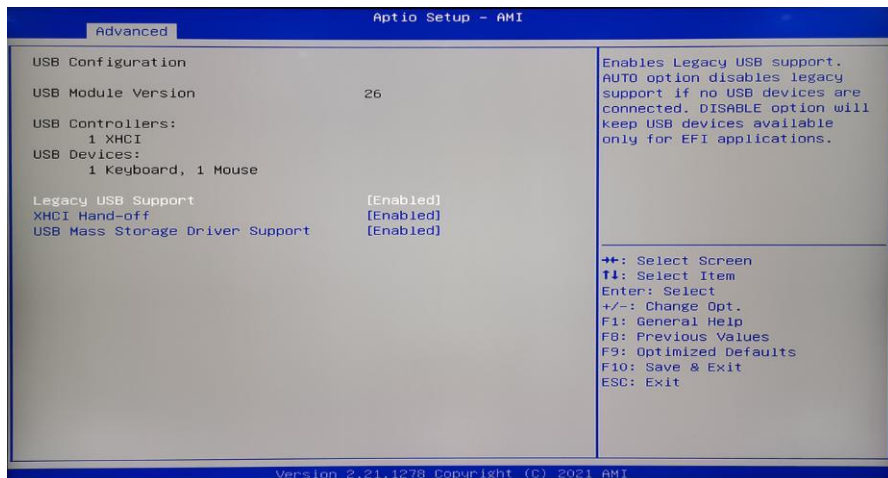
Fan start temperature limit :

Fan start PWM:

Pwm slope setting:



### 3.2.10 USB Configuration



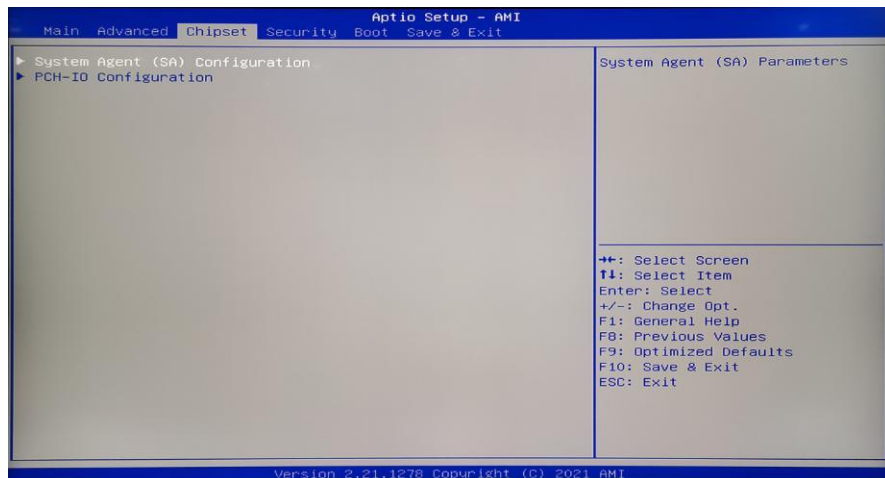
Legacy USB Support :

This is used for old version USB setting, if need to support USB devices in DOS, such as U disk, USB keyboard, etc. set this option as [Enabled] or [Auto]. Otherwise, choose [Disabled].

XHCI Hand-off: when operating system does not support XHCI, whether to allow BIOS to take over XHCI control

USB Mass Storage Driver Support :

### 3.2.11 Chipset

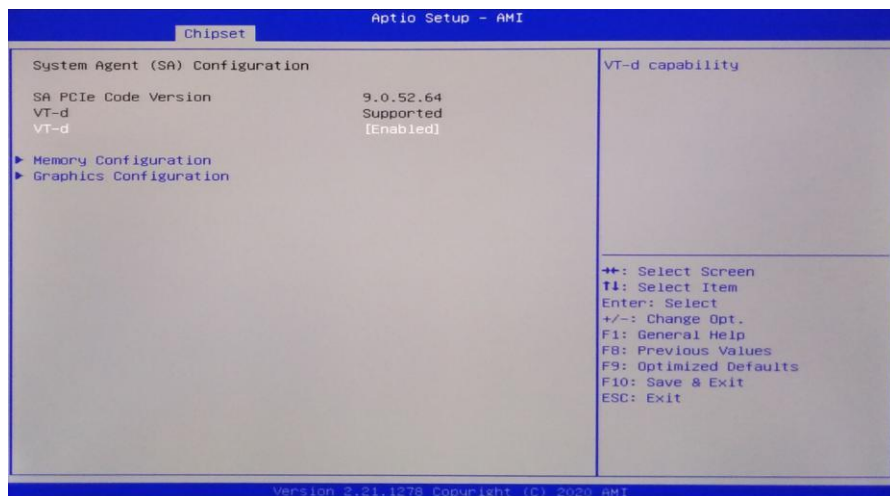


PCH-IO Configuration :

South Bridge configuration, Include audio card, LAN card, auto power on, etc

System Agent (SA) Configuration :

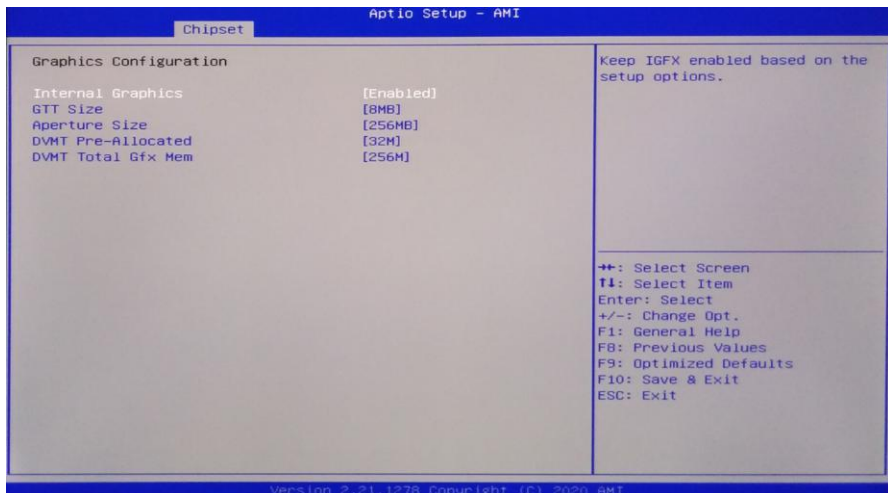
North bridge configuration option, include video memory, LVDS, etc



VT-d : Intel's I/O virtualization technology, requires chipset to support, some chipset support it, and some don't. The BIOS will show or hide this option according to different chipset. Please turn it on when installing the virtual machine.

Memory Configuration:

Graphics Configuration:

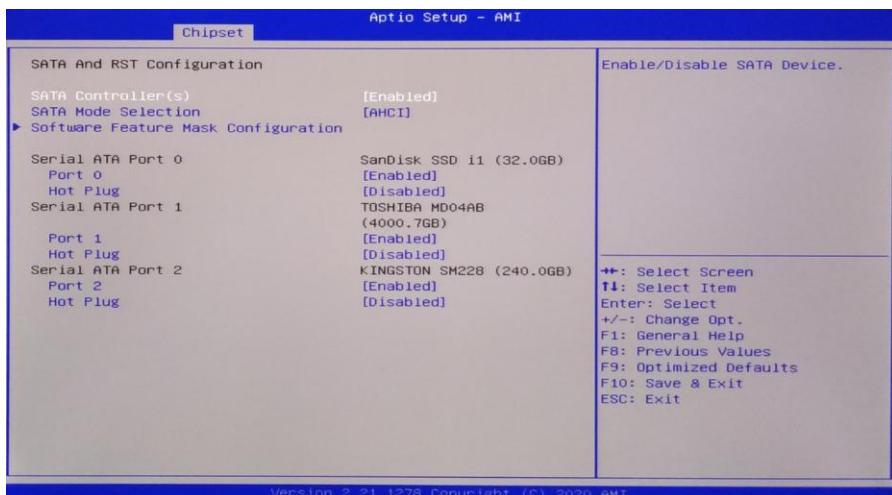


GTT Size: video memory size

DVMT Pre-Allocated: dynamic allocated video memory value.

DVMT Total Gfx Mem: dynamic allocated total Graphic card value.

Aperture Size: graphic card shared main memory size



SATA And RST Configuration:

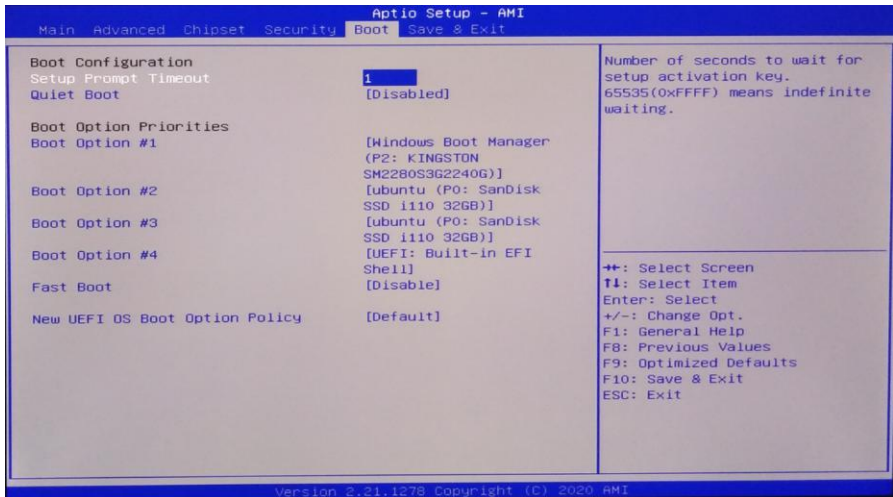
SATA Mode Selection: (AHCI or IDE)

SATA Controller speed:

Serial-ATA Port 0: (Enabled or Disabled)

Serial-ATA Port 1: (Enabled or Disabled)

### 3.2.12 Boot



Setup Prompt Timeout: click the Setup shortcut key to wait time. If did not click the setup shortcut key in the setup time it will continue to startup.

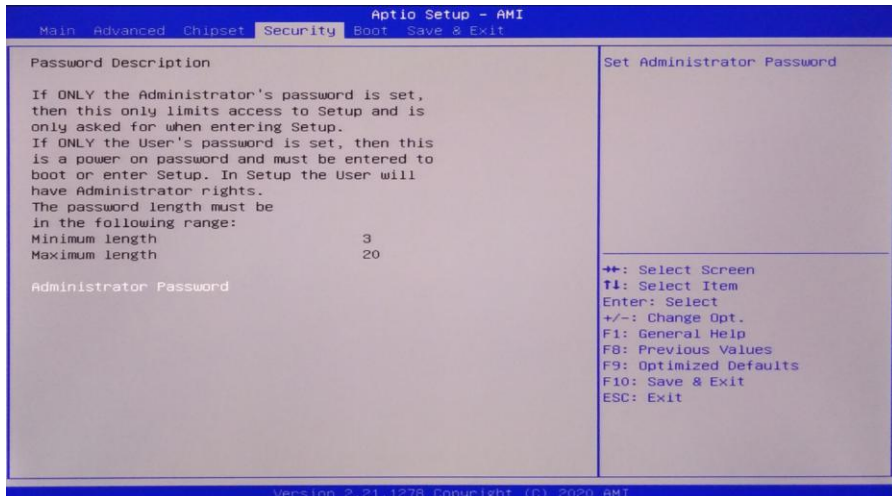
Bootup Numlock State : This function allows the numeric lock function of the keypad to be activated after the system is powered on to the DOS system. The default value is On, which means the digital lock is unlocked when the system starts. Set to Off, the keypad is in cursor control state at startup.

Quiet Boot: (Disabled or, enabled)

Fast Boot : (Disabled or, enabled)

New Boot Option Priorities: system will inspect device in accordance with the set procedure, until find a device that can be boot, and then boot from this device. Boot option #1 is the most preferred boot device.

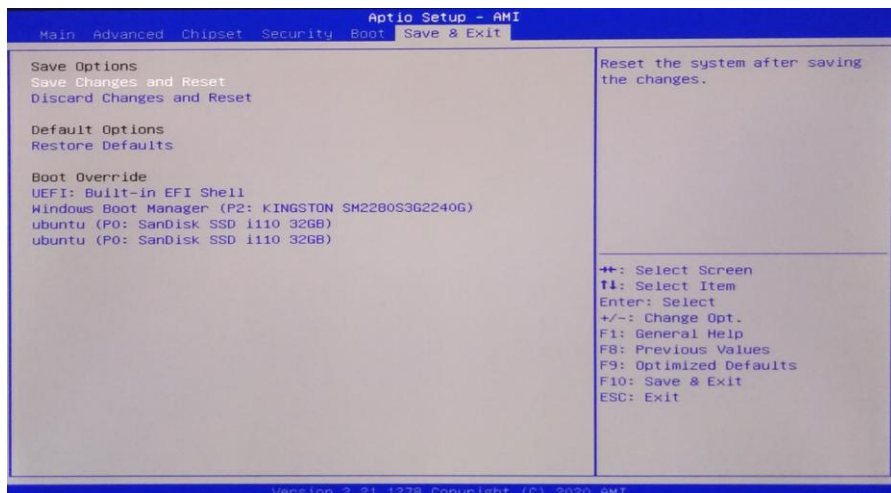
### 3.2.13 Security



Password character length: the minimum length is 3, the maximum length is 20.

Administrator Password : used for setting the supervisor password.

### 3.2.14 Save & Exit



**Save Changes and Reset :** Save the BIOS settings, and exit the settings interface, continue to start the computer

**Discard Changes and Reset :** Discard changes and exit setup interface, restart the computer.

**Restore Defaults:** Load optimization settings, if choose this, the system will be set according to the factory's optimal value.

**Boot Override :** Select the specified Boot device, such as SATA hard disk, U disk, Shell EFI, PXE and so on, direct Boot, do not save and exit, press F11 to select the specified device Boot.

# Appendix

## **Appendix one: Glossary of terms**

### **ACPI**

Advanced configuration and power management. The ACPI specification allows the operating system to control most of the power of the computer and its additional equipment.

### **BIOS**

Basic input / output system. It's a software that contains all the input/output control code interface in PC. When the system starts, it carries out the hardware detection., began to the operation of the operating system, between the operating system and hardware to provide an interface. BIOS is stored in a read-only memory chip.

### **BUS**

in a computer system, the exchange of data between the different parts of the channel, is a set of hardware lines. We refer to the BUS is usually CPU and main memory components within the local circuit.

### **Chipset**

Chipset is designed to perform one or more functions integrated chip. We refer to is composed of South Bridge and North Bridge System on chip group, It determines the structure and main function of the motherboard.

### **CMOS**

Complementary metal oxide semiconductor. Is a widely used semiconductor type. It has the characteristics of high-speed, low power consumption. We refer to CMOS is on the motherboard CMOS ram reserved space, used to save the date, time, system information and system parameter setting information.

### **COM**

Serial port, a universal serial communication interface, generally use the standard DB9 common interface connection mode.

**DIMM**

Dual in-line memory module. A memory chip group of small circuit board. The memory bus width of 64bit.

**DRAM**

Dynamic random access memory. A normal computer general memory types. A transistor and a capacitor is usually used to store a single bit. With the development of technology, type and specification of DRAM has in computer application becomes more and more diverse. For example, are now commonly used are: SDRAM, DDR SDRAM and RDRAM.

**LAN**

Local area network interface. A small region mutual association of computer is composed of a computer network is generally in a business unit or building. LAN is generally by the server, workstations, some communication links, a terminal can anywhere through the wire access to data and equipment. Many users can be expensive equipment and resource sharing.

**LED**

Light emitting diode, a semiconductor device, when the current flows through it will be lit, usually used to represent the information very intuitive, such as the power supply has been turned on or the hard drive is working.

**PnP**

Plug and play. Allows the PC external devices to be automatically configured, users cannot manually operate the system can work on their own specifications. To achieve this feature, BIOS support PnP and a PnP expansion cards are required.

**POST**

During the power on of OS, BIOS will perform a continuous testing on the system, including the detection of RAM, keyboard, hard drives, etc., to see whether they are



properly connected and whether the normal work.

### **PS/2**

The IBM development of a keyboard and mouse interface specification. PS/2 is a DIN only 6PIN interface can also be used to connect to other devices such as a modem.

### **USB**

Universal serial bus. A suitable for low-speed peripherals hardware interface, typically used to connect the keyboard, mouse, and so on. A PC up to 127 USB devices connected to provide a 12mbit / s transmission bandwidth; USB support hot swap and multiple data stream function, namely in the system can plug in a USB device, the system can automatically identify and allow the insertion of the device normal.

## **Appendix Two: Common issue analysis and solution**

| Common Faults                      | Check Points  |
|------------------------------------|---|
| No start up after connecting power | <ol style="list-style-type: none"><li>1. Make sure the power cable is connected properly</li><li>2. Please confirm all the power supply can meet the requirements of the motherboard</li><li>3. Try to re-plug the memory</li><li>4. Try to change the memory</li><li>5. Try to clear the CMOS according to motherboard manual</li><li>6. Please confirm whether there is an external card, remove the card and check again</li></ol> |
| VGA no display after power on      | <ol style="list-style-type: none"><li>1 To check whether the monitor is open</li><li>2 Check whether the power cable is properly connected to the monitor and system unit</li><li>3 Check whether the display cable is properly connected to the system unit and the display</li><li>4 Check whether the display brightness control is set to the dark</li></ol>  |

|  |   |
|--|---|
|  | state, can improve brightness through the brightness control.<br>5 Display in the "power save" mode, press any key on the keyboard  |
| BIOS Setup can not be saved                | 1. Please check whether the CMOS battery voltage is lower than 2.8V, if so, please replace a new battery, set again and save<br>2. BIOS settings are not correct, according to the boot screen prompt button (DEL), adjust the time and date in the Setup BIOS  |
| Prompt message cannot find bootable device | 1. Please check whether the hard drive power cord, data cable is connected normally<br>2. Please check whether the hard disk has physical damage<br>3. Please check whether the operating system is normally installed on the hard disk   |
| Blue screen or crash when enter into OS    | 1. Please check whether the memory card and the card is loose<br>2. Try to remove the newly installed hardware, uninstall the driver or software<br>3. Try to replace the memory  |
| Slow speed to enter into OS                | 1. Try to use third party software to check whether the hard disk has bad sectors<br>2. Please check whether the hard disk remaining space is too small for operating system.<br>3. Please check whether the CPU cooling fan is rotating normally   |
| System restart automatically               | 1. Please check whether the CPU cooling fan is rotating normally<br>2. Please check whether triggered reset button wrongly<br>3. Please use anti-virus software to confirm whether the system is infected with the virus<br>4. Please check whether the memory card and the card is loose<br>5. Please confirm that the power capacity is sufficient, can try to replace the power supply |
| Can not detect USB device                  | 1. Please check whether the USB device needs separate power supply<br>2. Please check whether the USB interface has bad contact<br>3. Please check whether the USB controller is open in BIOS Setup   |