# 3I810HW / 3I810BW

## Intel® Whiskey Lake-U Core™ I / Celeron processor, DDR4 LAN / HDMI / USB / Mini-PCIe / M.2

**All wafer IO SBC**

**8th gen. Intel Whiskey Lake-U Core™ I / Celeron CPU**

**VGA, HDMI, LVDS, PCIe mini card, 1 x M.2, USB**

**Multi-LAN, COM, Audio, SATA 1 x SIM**

**Wide Range +9~36V DC IN**

**Battery Charger Functin (3I810BW)**

CAUTION

RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.
DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS

**NO. 3I810HW/BW**
**Release date: May. 04. 2020**

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User Manual edition 0.1, May. 04. 2020

# Warning !

1. Battery
   Batteries on board are consumables.
   The life time of them are not guaranteed.

2. Fanless solution with HDD
   The specification & limitation of HDD should be considered carefully when the fanless solution is implemented.

3. We will not give further notification in case of changes of product information and manual.

4. SATA interface does not support Hot SWAP function.

5. There might be a 20% inaccuracy of WDT at room temperature.

6. Please make sure the voltage specification meets the requirement of equipment before plugging in.

7. There are two types of SSD, commercial grade and industrial grade, which provide different read / write speed performance, operation temperature and life cycle. Please contact sales for further information before making orders.

8. Caution! Please notice that the heat dissipation problem could cause the MB system unstable. Please deal with heat dissipation properly when buying single MB set.

9. Please avoid approaching the heat sink area to prevent users from being scalded with fanless products.

10. If users repair, modify or destroy any component of product unauthorizedly, We will not take responsibility or provide warranty anymore.

11. DO NOT apply any other material which may reduce cooling performance onto the thermal pad.

12. It is important to install a system fan toward the CPU to decrease the possibility of overheating / system hanging up issues, or customer is suggested to have a fine cooling system to dissipate heat from CPU.

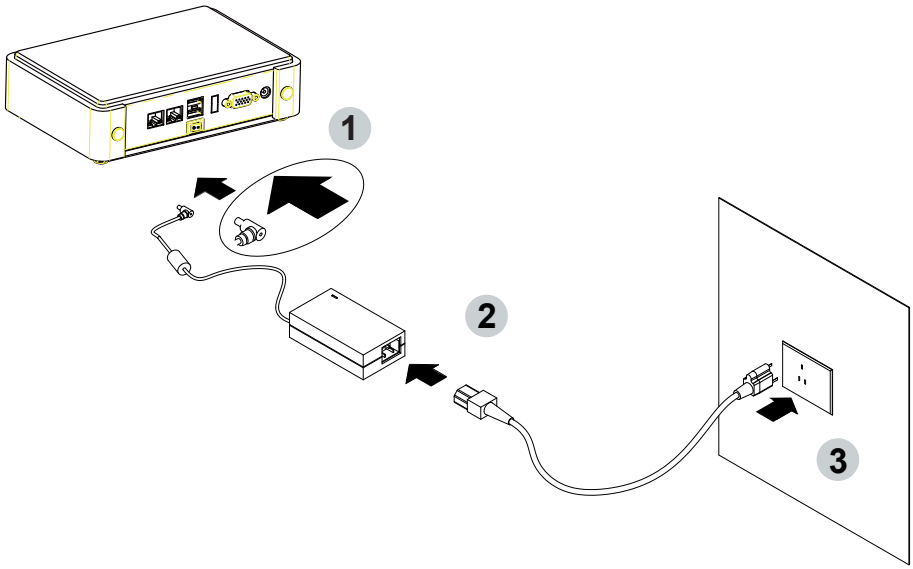
## ✻ Hardware Notice Guide

1. Before linking power supply with the motherboard, please attach DC-in adapter to the motherboard first. Then plug the adapter power to AC outlet.
   Always shut down the computer normally before you move the system unit or remove the power supply from the motherboard. Please unplug the DC-in adapter first and then unplug the adapter from the AC outlet.
   Please refer photo 1 as standard procedures.
2. In case of using DIRECT DC-in (without adapter), please check the allowed range for voltage & current of cables. And make sure you have the safety protection for outer issues such as short / broken circuit, overvoltage, surge, lightning strike.
3. In case of using DC-out to an external device, please make sure its voltage and current comply with the motherboard specification.
4. The total power consumption is determined by various conditions (CPU / motherboard type, device, application, etc.). Be cautious to the power cable you use for the system, one with UL standard will be highly recommended.
5. It's highly possible to burn out the CPU if you change / modify any parts of the CPU cooler.
6. Please wear wrist strap and attach it to a metal part of the system unit before handling a component. You can also touch an object which is ground connected or attached with metal surface if you don't have wrist strap.
7. Please be careful to handle & don't touch the sharp-pointed components on the bottom of PCBA.
8. Remove or change any components form the motherboard will VOID the warranty of the motherboard.
9. Before you install / remove any components or even make any jumper setting on the motherboard, please make sure to disconnect the power supply first. (follow the aforementioned instruction guide)
10. "POWERON after PWR-Fail" function must be used carefully as below:
    When the DC power adaptor runs out of power, unplug it from the DC current; Once power returns, plug it back after 5 seconds.
    If there is a power outage, unplug it from the AC current, once power returns, plug it back after 30 seconds. Otherwise it will cause system locked or made a severe damage.

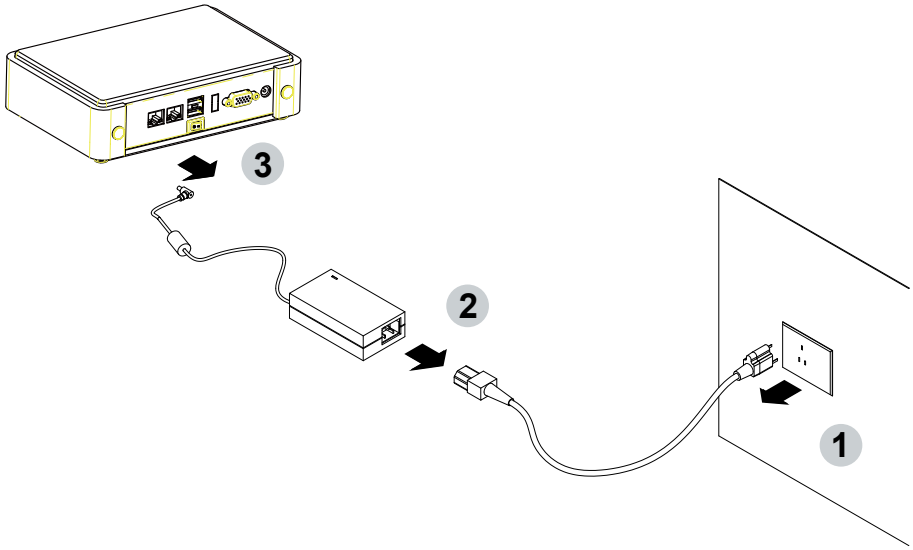
**Remark 1:**
**Always insert / unplug the DC-in horizontally & directly to / from the motherboard. DO NOT twist, it is designed to fit snugly.**
**Moreover, erratic pull / push action might cause an unpredictable damage to the component & system unit.**

## Photo 1

## Insert




## Unplug



# Chapter-1

## General Information

The 3I810HW / BW is an ultra compact (146 x 115 mm) SBC with 8th Gen. Intel® Whiskey Lake-U i7 / i5 / i3 / Celeron processor which offers users powerful and flexible solution for industrial and embedded applications. The battery charger (3I810BW) feature makes this platform well suited to reliability and mobility constrained embedded applications, such as Automation Control, Transportation, ATM machines, medical / hospital station and warehouse solution.

The 3I810HW / BW integrated 3 x GbE LAN, 7 x USB, 6 x COM Port and 1 x HDMI, VGA, eDP or LVDS display interface and supports high-speed data transfer interfaces such as PCIe gen3, USB 3.0, and SATA 6 Gb/s (SATA III), and supports 6 serial ports RS232 / RS485 / RS422 Selected by BIOS and +5V / 12V selectable by jumper. It supports 3 ports of USB 3.0, 4 ports of USB 2.0. The expandable interfaces include 1 full-size PCIe Mini card for PCIe x 1 / mSATA and USB 3.0 interface, 1 M.2 3042 B-key for PCIe x 1 / mSATA (auto-detect) and USB 3.0 interface. It is a much more efficient interface, providing lower latency, and is more scalable for SSDs than legacy interfaces, like serial ATA (SATA).

## 1-1 Major Feature

1. Intel® Celeron 4305UE Processor 2.0GHz, (Dual core), Intel® Core i5-8365UE Processor 1.6GHz / 4.1GHz (Quad core), Intel® Core i7-8665UE Processor 1.7GHz / 4.4GHz (Quad core)
2. Intel 9th generation (Gen 9) LP graphics and media encode/decode engine, Intel® Celeron 4305UE 300MHz / 1GHz, Intel® Core i5-8365UE 300MHz / 1.05GHz, Intel® Core i7-8665UE 300MHz / 1.15GHz
3. HDMI & VGA, LVDS or eDP
4. On board Memory & 1 x DDR4 SODIMM slot
5. Support 3 x 10 / 100 / 1000 Mbps Intel LAN ports.
6. Support 6 ports RS232 / RS422 / RS485 selected by BIOS
7. 3 x USB 3.0 and 4 x USB 2.0 (internal)
8. ALC886 HD Audio Specification 1.0, Two channel Class D Audio Amplifier
9. Support extended 1 x full-size Mini PCIe card for PCIe x 1 / mSATA and USB 3.0 interface
10. 1 NGFF B-key supports PCIe x 1 / mSATA and USB 3.0 interface devices
11. 1 SIM card socket pair with M.2 B-key 3042 (OEM)
12. Support 2 SATA port
13. Support PS2 Keyboard Mouse
14. Hardware digital Input & Output, 16 x DI / 16 x DO, Hardware Watch Dog Timer, 0~255 sec programmable
15. Support TPM 2.0 (Optional)
16. Wide Range DC IN +9V~36V
17. PCB Dimension: 146 x 115 mm

## 1-2 Specification

1. **SOC:** Intel® Celeron 4305UE Processor 2.0GHz, (Dual core), Intel® Core i5-8365UE Processor 1.6GHz / 4.1GHz (Quad core), Intel® Core i7-8665UE Processor 1.7GHz / 4.4GHz (Quad core)
2. **Memory:** On board memory & DDR4 SODIMM slot x 1
3. **Graphics:** Intel 9th generation (Gen 9) LP graphics and media encode / decode engine, Intel® Celeron 4305UE 300MHz / 1GHz, Intel® Core i5-8365UE 300MHz / 1.05GHz, Intel® Core i7-8665UE 300MHz / 1.15GHz. Support 1 HDMI 1.4 up to 3840 x 2160, VGA, eDP or LVDS up to 1920 x 1080
4. **LAN:** 1 Intel I219LM PHY & 2 Intel I210-IT LAN chipset with 10 / 100 / 1000 Mbps for PCIe x 1 V2.1
5. **I/O Chip:** Switch chipset for 6 ports RS232 / RS422 / RS485 selected by BIOS
6. **Audio:** ALC886 HD Audio Specification 1.0 Two channel sound,
   Two channel Class D Audio Amplifier
7. **USB:** 3 type A USB 3.0, 4 USB 2.0 (internal)
8. **SATA:** Integrated Serial ATA Host Controller 2 SATA port, SATA Gen3 Data transfer rates up to 6.0 Gb/s (600 MB/s).
9. **Expansion interface:** one full-size PCIe Mini card for PCIe x 1 / mSATA (auto-detect, mSATA shared with SATA2) and USB 3.0 interface, one M.2 3042 B-key for PCIe x 1 / mSATA (auto-detect) and USB interface
10. **WDT / DIO:** Hardware digital Input & Output, 16 x DI / 16 x DO (Option) /
    Hardware Watch Dog Timer, 0~255 sec programmable
11. **SIM:** 1 socket pair with M.2 B-key 3042 (OEM)
12. **TPM:** SLB 9665 TT 2.0 Trusted Platform Module (Optional)
13. **BIOS:** AMI UEFI BIOS
14. **Dimension:** 146 x 115 mm
15. **Power:** On board DC +9V/36V

## 1-3 Installing the SO-DIMM

1. Align the SO-DIMM with the connector at a 45 degree angle.




2. Press the SO-DIMM into the connector until you hear a click.



Notices:

1.The connectors are designed to ensure the correct insertion. If you feel resistance, check the connectors & golden finger direction, and realign the card.




2. Make sure the retaining clips (on two sides of the slot) lock onto the notches of the card firmly.



## 1-3-1 Removing the SO-DIMM

1. Release the SO-DIMM by pulling outward the two retaining clips and the SO-DIMM pops up slightly.




2. Lift the SO-DIMM out of its connector carefully.

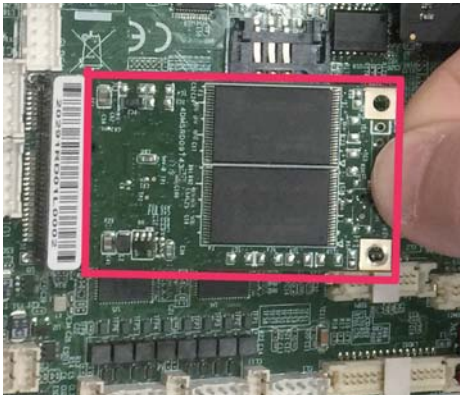


## 1-4 Installing the Mini PCI-e Card (Full Size)

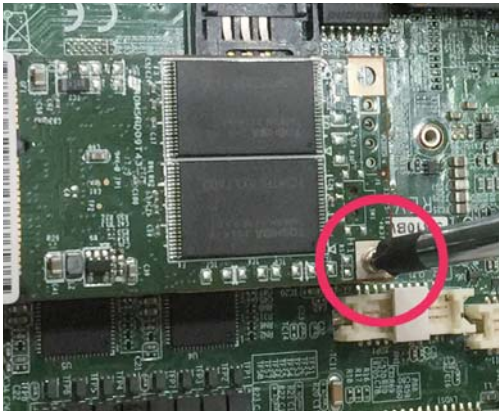
1. Unscrew the screw on the board



2. Plug in the Mini Card in a 45 angle



3. Gently push down the Mini Card and screw the screw back.



## 1-5 Directions for installing the M.2B Key Mini Card

1. Unscrew the screw on the board



2. Plug in the Mini Card in a 45 angle

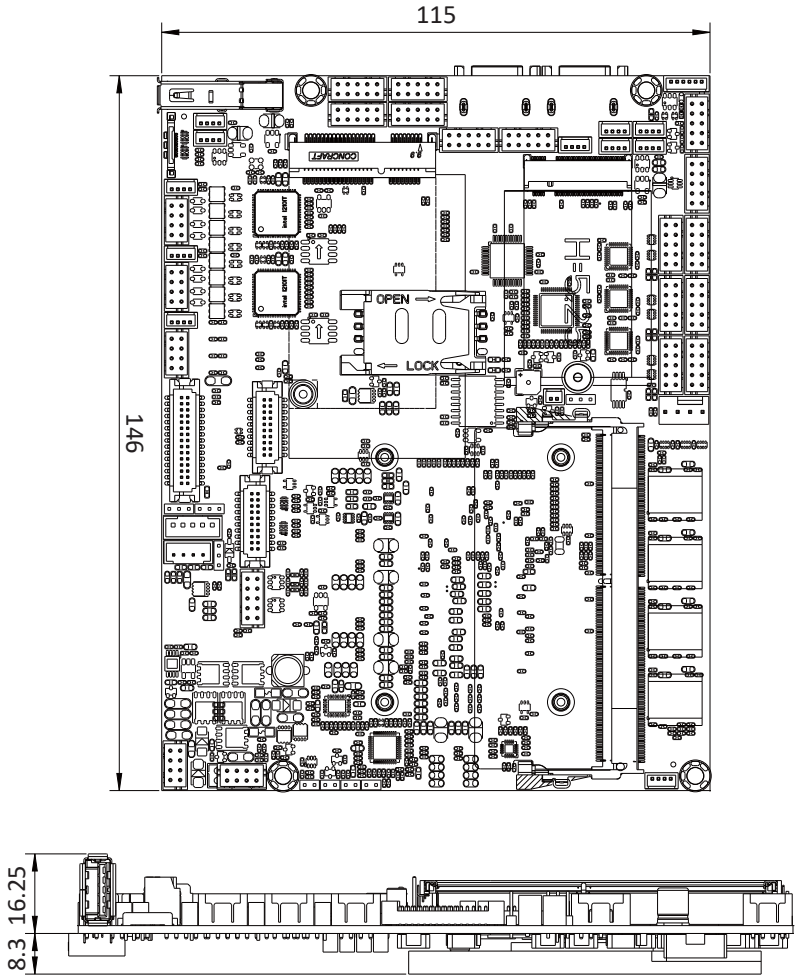


3. Gently push down the Mini Card and screw the screw back.



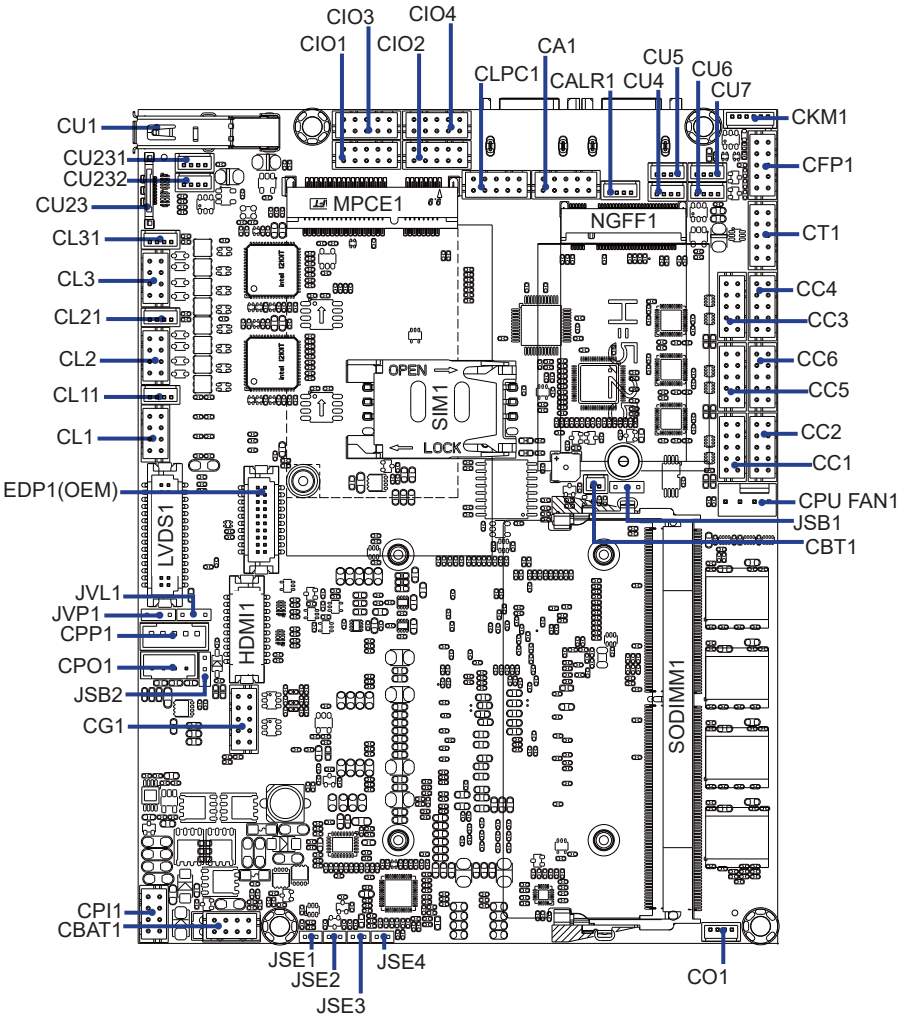
# Chapter-2

## 2-1 Dimension-3I810HW



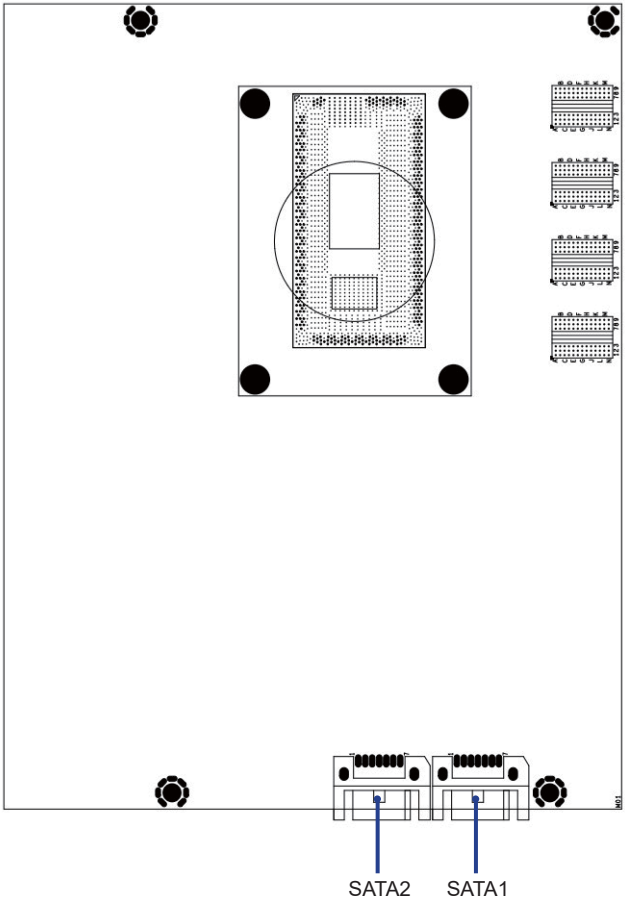
## 2-2 Layout-3I810HW-Connector and Jumper

TOP



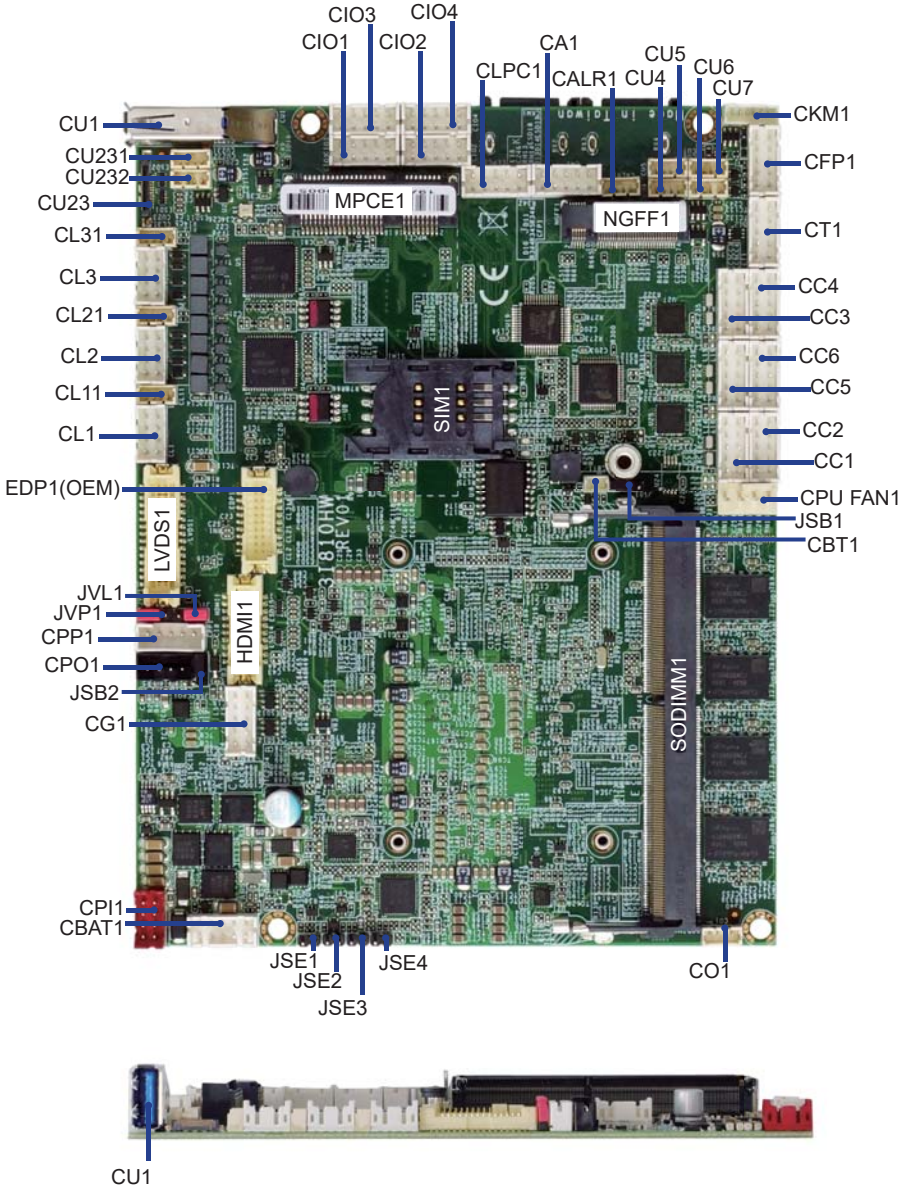
## 2-2-1 Layout-3I810HW-Connector and Jumper

BOT



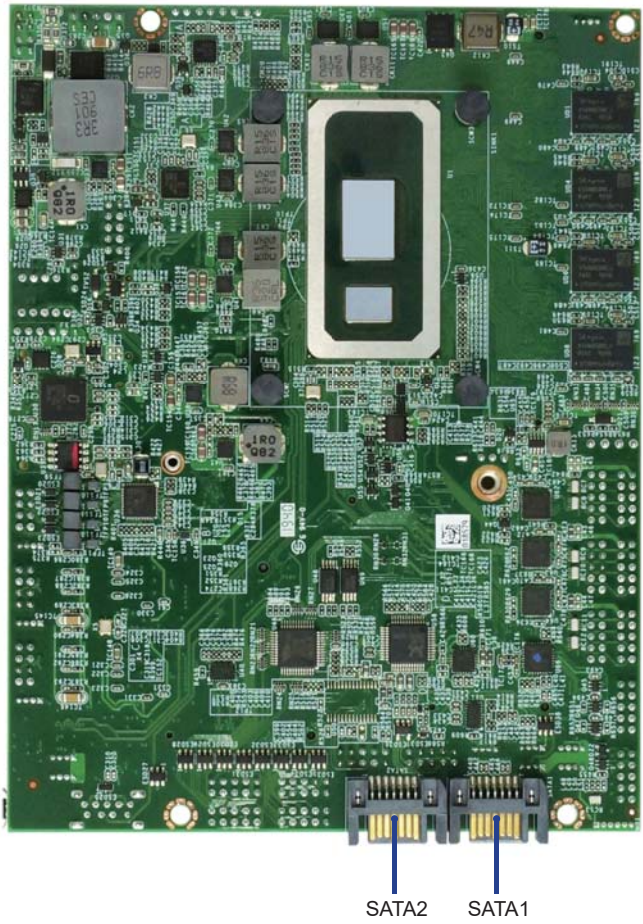
## 2-2-2 Diagram- 3I810HW

TOP



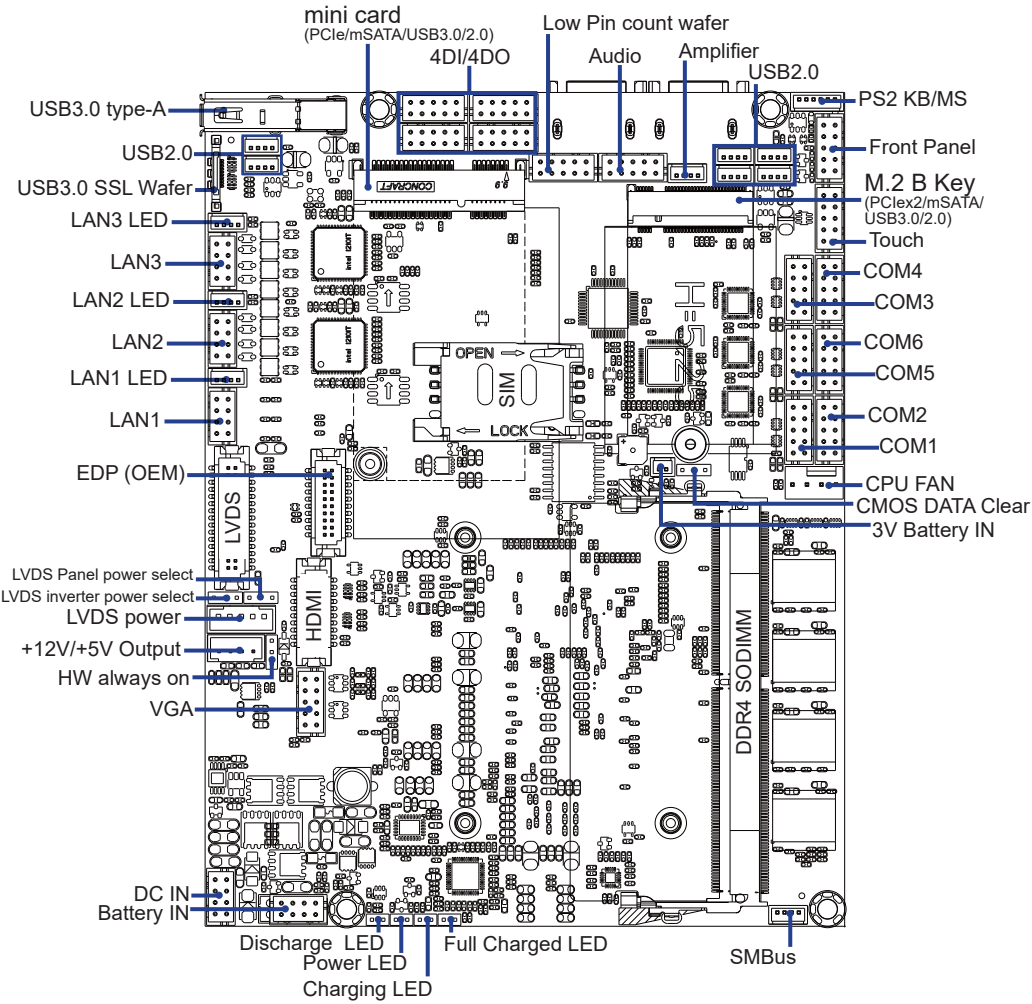
## 2-2-3 Diagram- 3I810HW

BOT



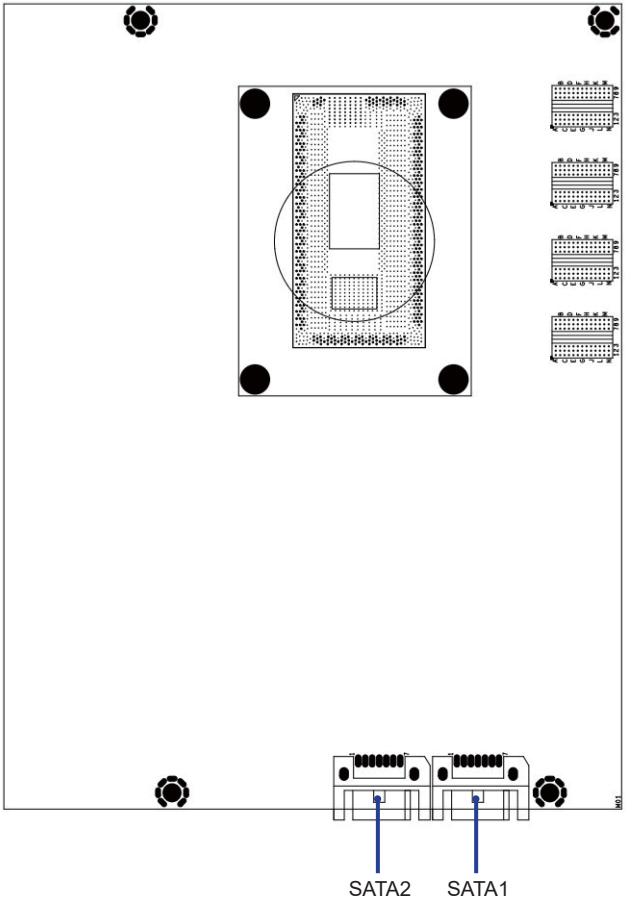
## 2-3 LAYOUT-3I810HW-FUNCTION MAP

TOP

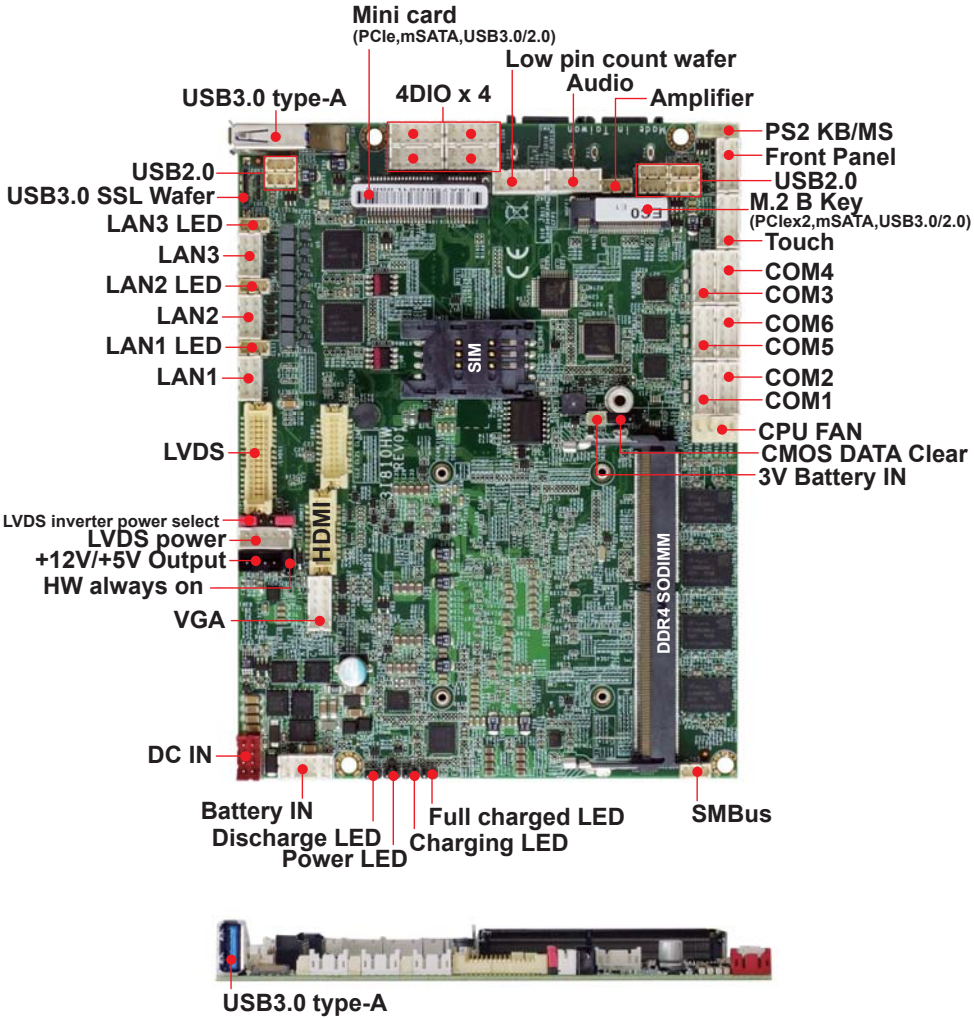


## 2-3-1 LAYOUT-3I810HW-FUNCTION MAP

BOT



## 2-3-2 Function MAP- 3I810HW



## 2-4 List of Jumpers

JSB1: CMOS DATA Clear
JSB2: HW system always on
JVL1: LCD panel power select
JVP1: LVDS panel Inverter power select

## 2-5 Jumper Setting Description

A jumper is ON as a closed circuit with a plastic cap covering two pins. A jumper is OFF as an open circuit without the plastic cap. Some jumpers have three pins, labeled 1, 2, and 3. You could connect either pin 1 and 2 or 2 and 3.
The below figure 2.2 shows the examples of different jumper settings in this manual.

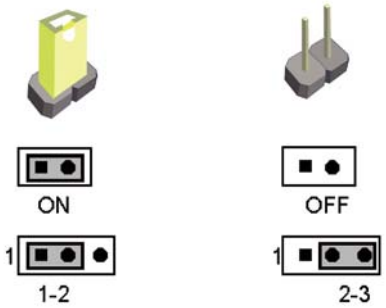



**Figure 2.2**

All jumpers already have its default setting with the plastic cap inserted as ON, or without the plastic cap as OFF. The default setting may be referred in this manual with a " * " symbol .

## 2-6 JSB1: CMOS DATA Clear

A battery must be used to retain the motherboard configuration in CMOS RAM.
Close Pin1 and pin 2 of JSB1 to store the CMOS data.

To clear the CMOS, follow the procedures below:

1. Turn off the system and unplug the AC power.
2. Make sure there is no AC & DC power connect to the system or MB.
3. Close pin 2-3 of JSB1 for a few seconds.
4. Return to default setting by close pin 1-2
5. Connect DC IN power cable back to DC IN Power connector

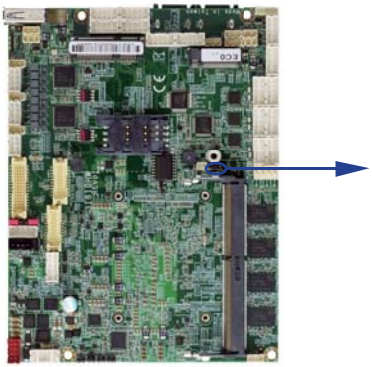
| JSB1 | DESCRIPTION |
|---|---|
| *1-2 | Normal set |
| 2-3 | CMOS / ME data clear |

Note: Do not clear CMOS unless

***1. Troubleshooting***

***2. Forget password***

***3. You fail over-clocking system***



**JSB1**



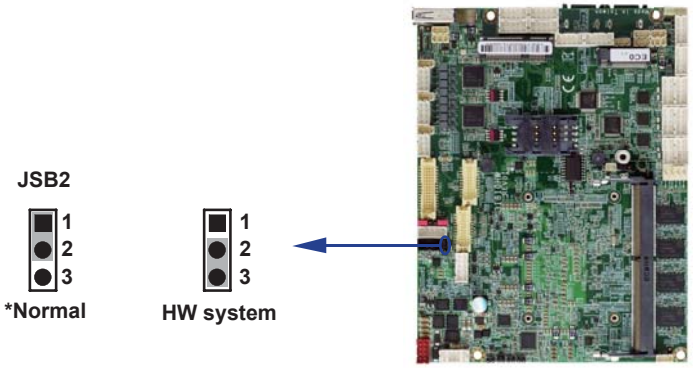

***Normal**




**CMOS/ME**

## 2-7 JSB2: HW system always on

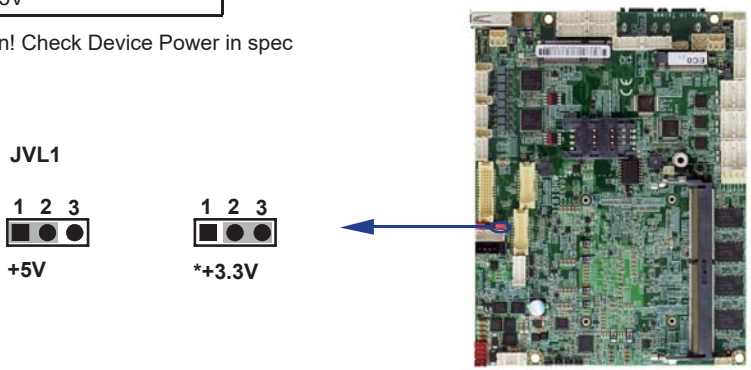
| JSB2 | DESCRIPTION |
|---|---|
| *1-2 | Normal Set |
| 2-3 | HW system always on |




## 2-8 JVL1: LCD panel power select

| JVL1 | DESCRIPTION |
|---|---|
| 1-2 | +5V |
| *2-3 | +3.3V |

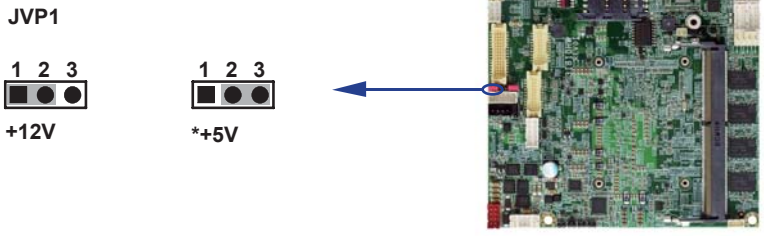
Note: Attention! Check Device Power in spec



## 2-9 JVP1: LVDS panel Inverter power select

| JVP1 | DESCRIPTION |
|---|---|
| 1-2 | +12V |
| *2-3 | +5V |

Note: Attention! Check Device Power in spec



# Chapter-3

## Connection

This chapter provides all necessary information of the peripheral's connections, switches and indicators. Always power off the board before you install the peripherals.

## 3-1 List of Connectors

| | |
|---|---|
| CPI1: | DC 12V-IN 2x4pin (2.0mm) Red wafer |
| CBAT1: | Battery charge In 2x5pin (2.0mm) wafer |
| JSE1: | Battery Output LED 1x2pin (2.0mm) Pin Header |
| JSE2: | Battery Discharge LED 1x2pin (2.0mm) Pin Header |
| JSE3: | Battery charge LED 1x2pin (2.0mm) Pin Header |
| JSE4: | Battery Full charged LED 1x2pin (2.0mm) Pin Header |
| CBT1: | CMOS battery 1x2pin (1.25mm) wafer |
| CA1: | Line-out / Line-in / Mic-in / SPDIF-out 2x5pin (2.0mm) wafer |
| CALR1: | Amplifier Line-out Right / Left channel 1x4pin (1.25mm) wafer |
| CC1~CC6 : | COM 2x5pin (2.0mm) wafer |
| CFP1: | Front Panel connector 2x5pin (2.0mm) wafer |
| CIO1~CIO4: | 4DI / 4DO 2x5pin (2.0mm) wafer |
| FAN1: | CPU Fan 1x4pin (2.54mm) wafer |
| CG1: | VGA 2x5pin (2.0mm) wafer |
| HDMI1: | HDMI 2x10pin (1.25mm) wafer |
| LVDS1: | LVDS 2x15pin (1.25mm) wafer |
| CPP1: | Panel inverter power connector 1x5pin (2.0mm) wafer |
| CT1: | USB Touch screen device 2x5pin (2.0mm) wafer |
| CU1: | USB 3.0 Type A connector |
| CU23: | USB 3.0 1x10pin (0.5mm) wafer |
| CU231/CU232 : | USB 2.0 port 1x4pin (1.25mm) wafer |
| CU4~CU7: | USB 2.0 port 1x4pin (1.25mm) wafer |
| CL1~CL3 : | LAN 2x4pin (2.0mm) wafer |
| CL11~CL31: | LAN LED 1x4pin (1.25mm) wafer |
| CO1: | I2C Bus 1x4pin (1.25mm) wafer |
| CKM1: | PS2 KB/MS 1x6pin (1.25mm) wafer |

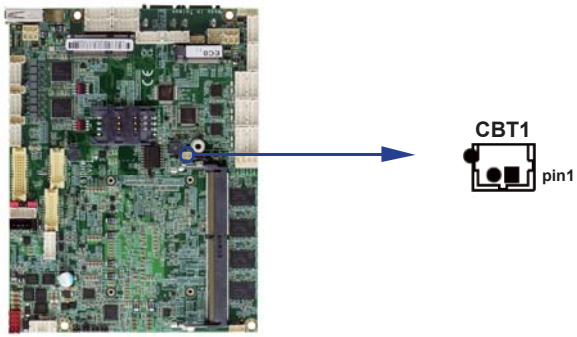
| | |
|---|---|
| CLPC1: | Low Pin Count 2x5pin (2.0mm) wafer |
| CPO1: | +12V / +5V power output 4pin (2.0mm) Black wafer |
| SATA1: | SATA connector 7pin |
| SODIMM1: | DDR4 Channel 0 SODIMM H: 9.2mm |
| MPCE1: | Full size mini card sockets 52pin H: 9.9mm |
| NGFF1: | M.2 NGFF B key sockets 75pin H: 8.5mm |
| SIM1: | SIM card socket |

## 3-2 CMOS battery connector

- **CBT1: CMOS Battery in 1x2pin (1.25mm) wafer**

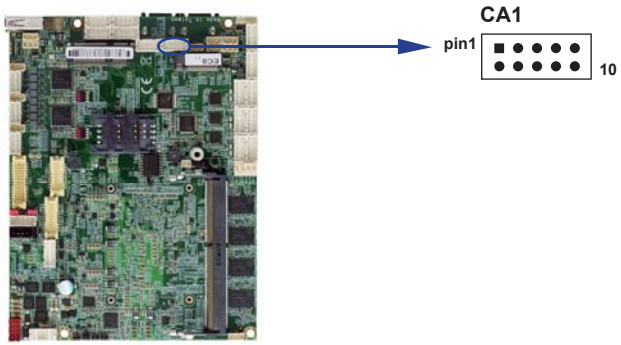
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | GND | 2 | +3V |

Note:
1. When the board without Adaptor plug in, this board power RTC consumption about 2.7uA
2. If adaptor always plug in RTC power consumption about 0.1uA



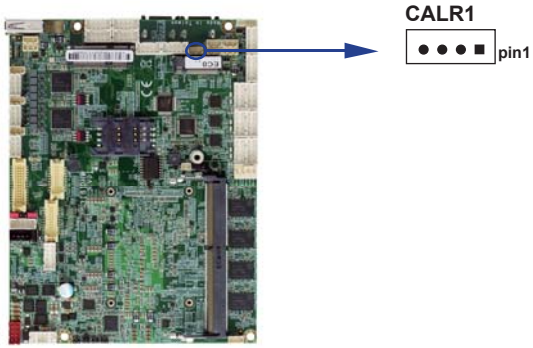
## 3-3 CA1: Line-out / Line-in / Mic-in 2x5pin (2.0mm) Wafer

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | Line-out-R | 2 | MIC-IN |
| 3 | Line-in-R | 4 | GND |
| 5 | GND | 6 | GND |
| 7 | Line-in-L | 8 | +5V |
| 9 | Line-out-L | 10 | MIC-IN |



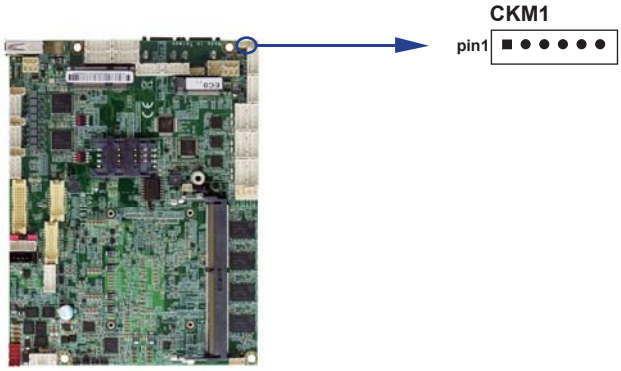

## 3-4 CALR1: Amplifier Line-out Right / Left channel 1x4pin (1.25mm) Wafer

| PIN NO. | DESCRIPTION |
|---|---|
| 1 | Left+ |
| 2 | Left- |
| 3 | Right- |
| 4 | Right+ |



## 3-5 CKM1: PS2 KB/MS 1x6pin (1.25mm) Wafer

| PIN NO. | DESCRIPTION |
|---|---|
| 1 | +5V |
| 2 | Keyboard Data |
| 3 | Keyboard Clock |
| 4 | GND |
| 5 | Mouse DATA |
| 6 | Mouse Clock |



## 3-6 CC1 / CC2 / CC3 / CC4 / CC5 / CC6: COM 2x5pin (2.0mm) Wafer

- **(RS232 Mode)**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | DCD | 2 | RXD |
| 3 | TXD | 4 | DTR |
| 5 | GND | 6 | DSR |
| 7 | RTS | 8 | CTS |
| 9 | RI / VCC | 10 | +5V |

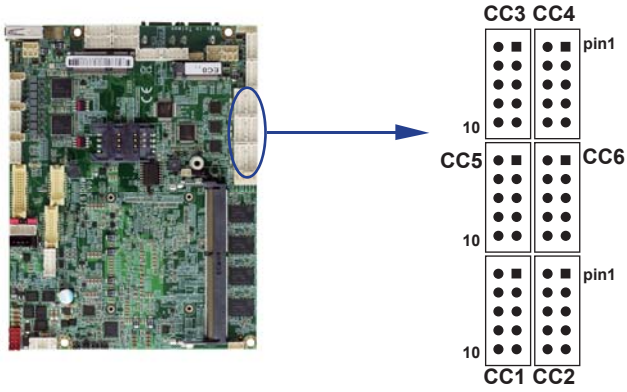
- **(RS485 Mode)**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | Data- | 2 | Data+ |
| 3 | NC | 4 | NC |
| 5 | GND | 6 | NC |
| 7 | NC | 8 | NC |
| 9 | NC | 10 | +5V |

- **(RS422 Mode)**

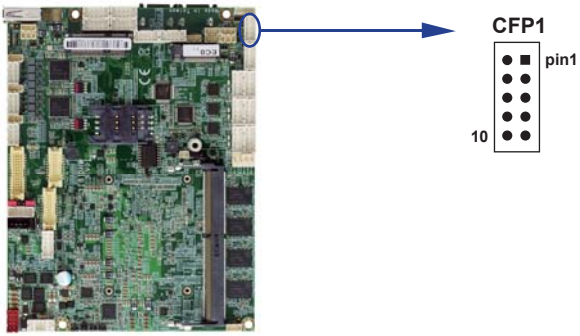
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | TX- | 2 | TX+ |
| 3 | RX+ | 4 | RX- |
| 5 | GND | 6 | NC |
| 7 | NC | 8 | NC |
| 9 | NC | 10 | +5V |

Note:
1. Pin 9 RI and Voltage setting only for COM1 / 2 ports, is used BOM control.
2. Default support RS232 / RS422 / RS485 by BIOS selected



## 3-7 CFP1 Front Panel connector 2x5pin (2.0mm) wafer

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | Power button pin | 2 | Power button GND |
| 3 | Reset pin | 4 | Reset GND |
| 5 | Power LED- | 6 | Power LED+ |
| 7 | HDD LED- | 8 | HDD LED+ |
| 9 | LAN LED- | 10 | LAN LED+ |



## 3-8 DIO Interface

**● CIO1: 4DI / 4DO 2x5pin (2.0mm) Wafer**

| PIN NO. | Description | PIN NO. | Description |
|---|---|---|---|
| 1 | DI-0 | 2 | DO-3 |
| 3 | DI-1 | 4 | DO-2 |
| 5 | DI-2 | 6 | DO-1 |
| 7 | DI-3 | 8 | DO-0 |
| 9 | GND | 10 | +5V |

**● CIO2: 4DI / 4DO 2x5pin (2.0mm) Wafer**

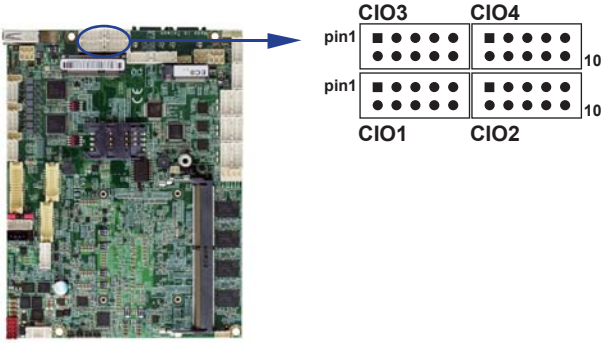
| PIN NO. | Description | PIN NO. | Description |
|---|---|---|---|
| 1 | DI-4 | 2 | DO-7 |
| 3 | DI-5 | 4 | DO-6 |
| 5 | DI-6 | 6 | DO-5 |
| 7 | DI-7 | 8 | DO-4 |
| 9 | GND | 10 | +5V |

**● CIO3: 4DI / 4DO 2x5pin (2.0mm) Wafer**

| PIN NO. | Description | PIN NO. | Description |
|---|---|---|---|
| 1 | DI-8 | 2 | DO-11 |
| 3 | DI-9 | 4 | DO-10 |
| 5 | DI-10 | 6 | DO-9 |
| 7 | DI-11 | 8 | DO-8 |
| 9 | GND | 10 | +5V |

**● CIO4: 4DI / 4DO 2x5pin (2.0mm) Wafer**

| PIN NO. | Description | PIN NO. | Description |
|---|---|---|---|
| 1 | DI-12 | 2 | DO-15 |
| 3 | DI-13 | 4 | DO-14 |
| 5 | DI-14 | 6 | DO-13 |
| 7 | DI-15 | 8 | DO-12 |
| 9 | GND | 10 | +5V |




- **WDT For F75113 $I^2C$ watch dog timer device:**

  DC spec:

  Input low Voltage (VIL): +0.8 Max,

  Input High Voltage(VIH) : +2V Min

  Output low Current (IOL): 10mA (Min) VOL=0.4V

  Output High Current (IOH): -10mA (Min) VOH=2.4V

  Watch Dog Time value 0~255 sec

  The system will be issued reset. When WDT is enable the hardware start down counter to zero.

  The reset timer have 10~20% tolerance upon the Temperature.

  Note: If want to SDK support. Please contact to sales window.

## 3-8-1 IO Device:F75113 LPC under Windows (64bit)

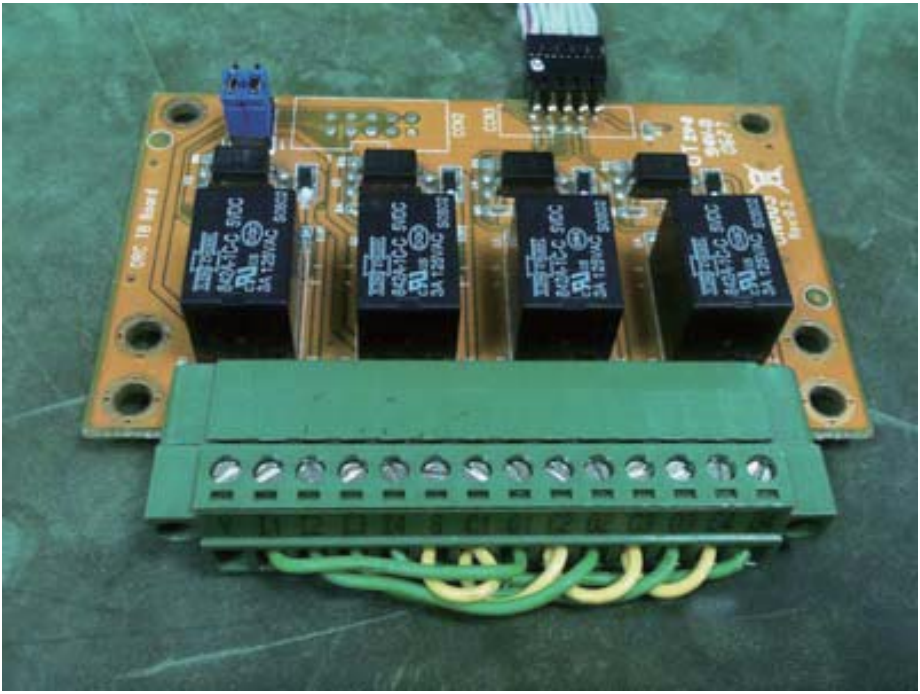
### The Sample code source you can download from

**Source file: F75113v2.5.1W_src.zip**

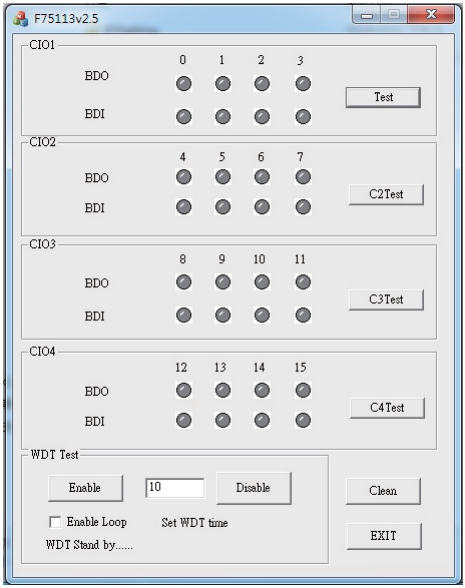
**Binary file: F75113v2.5.1W_bin_x64.zip**

http://tprd.info/lexwiki/index.php/IO_Device:F75113_LPC_under_Windows%2864bit%29A

### We do the demo test with a test tool which DIx connect to DOx with Relay.



**How to use this Demo Application**



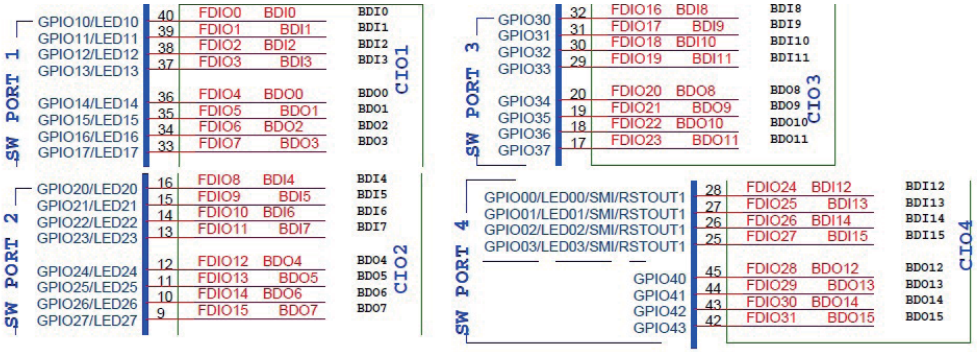

1. Press the "Test" button to test CIO1 function
2. Press the "C2test" button to test CIO2 function
3. Press the "C3test" button to test CIO3 function
4. Press the "C4test" button to test CIO4 function

If the next picture appears




MB no LPC or the drive placement is wrong
Drive the location for the next picture

## F75113 GPIO Picture




## Introduction

## F75113 driver connection

```
hinstLib = LoadLibrary(L"Fintek.dll");
 if (hinstLib == NULL)
 {
    if(Application->MessageBoxW(L"Load fail Fintek.dll,Continued?",L"Error",16+4)==IDNO)
    {
      Application->Terminate();
    }
      return;
 }
```

### GPIO Status Register Write

```
SETINT2PROC ProcAdd;
char *endptr;
char Numbers[] = "0x20";
char Value[] =   "0xF0";
ProcAdd = (SETINT2PROC) GetProcAddress(hinstLib, "GPIO_LPC_W");
if (NULL != ProcAdd)
 {
   if (! (*ProcAdd)( strtol(Numbers, &endptr, 16), strtol(Value, &endptr, 16)))
   {
     ShowMessage("Write Fail");
   }
 }
```

## GPIO Status Register Read

```
GETINT2PROC ProcAdd1;
 int datatest;
 char NRtest[] = "0x22";
 ProcAdd1 = (GETINT2PROC) GetProcAddress(hinstLib, "GPIO_LPC_R");
 if (NULL != ProcAdd1)
 {
  if (! (*ProcAdd1)( strtol(NRtest, &endptr, 16), &datatest))
  {
    ShowMessage("Read Fail");
  }
 }
```

## GPIO Comparison

```
if( data == 0xF0 )
 {
  ((CStatic *)GetDlgItem(IDC_LED_DO0))->SetBitmap(::LoadBitmap(AfxGetInstanceHandle(),MAKEINTRESOURCE
  (IDB_BITMAP_Green)));
  ((CStatic *)GetDlgItem(IDC_LED_DO1))->SetBitmap(::LoadBitmap(AfxGetInstanceHandle(),MAKEINTRESOURCE
  (IDB_BITMAP_Green)));
  ((CStatic *)GetDlgItem(IDC_LED_DO2))->SetBitmap(::LoadBitmap(AfxGetInstanceHandle(),MAKEINTRESOURCE
  (IDB_BITMAP_Green)));
  ((CStatic *)GetDlgItem(IDC_LED_DO3))->SetBitmap(::LoadBitmap(AfxGetInstanceHandle(),MAKEINTRESOURCE
  (IDB_BITMAP_Green)));
  if( data2 == 0x01 )
  {
    ((CStatic *)GetDlgItem(IDC_LED_DI0))->SetBitmap(::LoadBitmap(AfxGetInstanceHandle(),MAKEINTRESOURCE
     (IDB_BITMAP_Green)));
    ((CStatic *)GetDlgItem(IDC_LED_DI1))->SetBitmap(::LoadBitmap(AfxGetInstanceHandle(),MAKEINTRESOURCE
     (IDB_BITMAP_Red)));
    ((CStatic *)GetDlgItem(IDC_LED_DI2))->SetBitmap(::LoadBitmap(AfxGetInstanceHandle(),MAKEINTRESOURCE
     (IDB_BITMAP_Red)));
    ((CStatic *)GetDlgItem(IDC_LED_DI4))->SetBitmap(::LoadBitmap(AfxGetInstanceHandle(),MAKEINTRESOURCE
     (IDB_BITMAP_Red)));
  }
   .....
 }
```

### F75113 driver delete

```
char N9[] = "0x10";
char V9[] = "0x00";
ProcAdd = (SETINT2PROC) GetProcAddress(hinstLib, "GPIO_LPC_W");
 if (NULL != ProcAdd)
 {
  if (! (*ProcAdd)( strtol(N9, &endptr, 16), strtol(V9, &endptr, 16)))
   {
    ShowMessage("Write Fail");
   }
 }
 if (hinstLib != NULL)
 {
  FreeLibrary(hinstLib);
 }
```

## 3-8-2 IO Device: F75113 LPC under Linux (64bit)

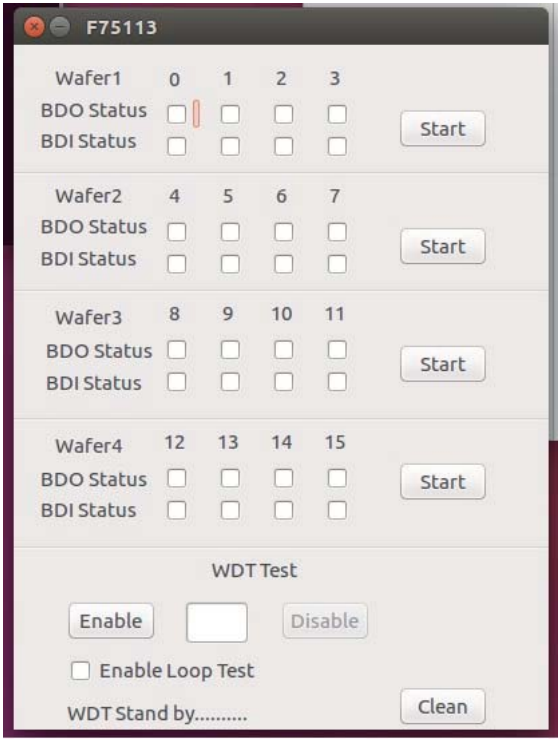
### The Sample code source you can download from

**Source file: F75113V2.5.1L_src.tar.gz**

**Binary file: F75113v2.5.1L_bin.tar.gz**

http://tprd.info/lexwiki/index.php/IO_Device:F75113_LPC_under_Linux%2864bit%29

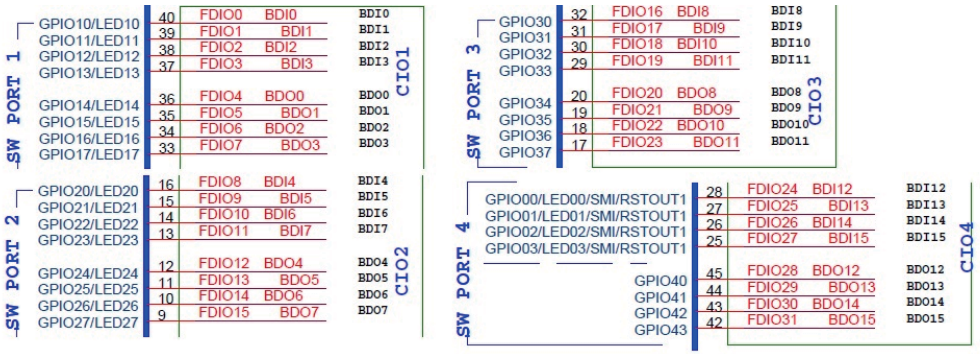
### How to use this Demo Application




1. Press the "Start" button to test CIO1 function
2. Press the "Start" button to test CIO2 function
3. Press the "Start" button to test CIO3 function
4. Press the "Start" button to test CIO4 function
5. Press the "Enable" button to test WDT function

If you need to use the WDT, Please use "sh F75113set.sh"
He can help you set the WDT register for normal use WDT

## F75113 GPIO Picture




## Introduction

## GPIO Status Register Write

```
init_fintek_sio(eSIO_TYPE_F75113, 0 ,&sio_data)
ActiveSIO(sio_data.ic_port, sio_data.key);
CHECK_RET(_EnableGPIO(0x06 , eGPIO_Mode_Enable));
CHECK_RET(_SetGpioOutputEnableIdx( 0x06 , eGPIO_Direction_Out));
CHECK_RET(_SetGpioDriveEnable( 0x06 , eGPIO_Drive_Mode_OpenDrain));
CHECK_RET(_SetGpioOutputDataIdx( 0x06 , 1));
DeactiveSIO(sio_data.ic_port);
```

## GPIO Status Register Read

```
init_fintek_sio(eSIO_TYPE_F75113, 0 ,&sio_data)
ActiveSIO(sio_data.ic_port, sio_data.key);
CHECK_RET(_EnableGPIO(0x06 , eGPIO_Mode_Enable));
CHECK_RET(_SetGpioOutputEnableIdx( 0x06 , eGPIO_Direction_In));
CHECK_RET(_GetGpioInputDataIdx( 0x06 , &data));
DeactiveSIO(sio_data.ic_port);
```

### GPIO Comparison

```
CHECK_RET(_GetGpioInputDataIdx (0x10,&BDIO_data));
if((BDIO_data == 1) & (BDIO_startvalue_data == 0) )
{
        gtk_toggle_button_set_active(GTK_TOGGLE_BUTTON(checkbutton2), TRUE);
}
CHECK_RET(_GetGpioInputDataIdx (0x11,&BDI1_data));
if((BDI1_data == 1) & (BDI1_startvalue_data == 0) )
{
        gtk_toggle_button_set_active(GTK_TOGGLE_BUTTON(checkbutton4), TRUE);
}
CHECK_RET(_GetGpioInputDataIdx (0x12,&BDI2_data));
 if((BDI2_data == 1) & (BDI2_startvalue_data == 0) )
{
        gtk_toggle_button_set_active(GTK_TOGGLE_BUTTON(checkbutton6), TRUE);
 }
CHECK_RET(_GetGpioInputDataIdx (0x13,&BDI3_data));
 if((BDI3_data == 1) & (BDI3_startvalue_data == 0) )
{
        gtk_toggle_button_set_active(GTK_TOGGLE_BUTTON(checkbutton8), TRUE);
 }
```

### F75113 driver delete

```
 on_window1_destory        (GtKObject    *object,
                    gpointer      user_data)
{
        int nRet = 0;
        sFintek_sio_data sio_data;
        set_debug(1);
        if( nRet = init_fintek_sio(eSIO_TYPE_F75113,0, &sio_data))
        {
        fprintf(stderr,"init_fintek_sio error\n");
        exit(3);
}
        ActiveSIO(sio_data.ic_port, sio_data.key);
        DeactiveSIO(sio_data.ic_port);
        gtk_main_quit();
}
```

## 3-9 USB Interface

**● CU23: USB 3.0 Port 1x10pin (0.5mm) SSL-Wafer**

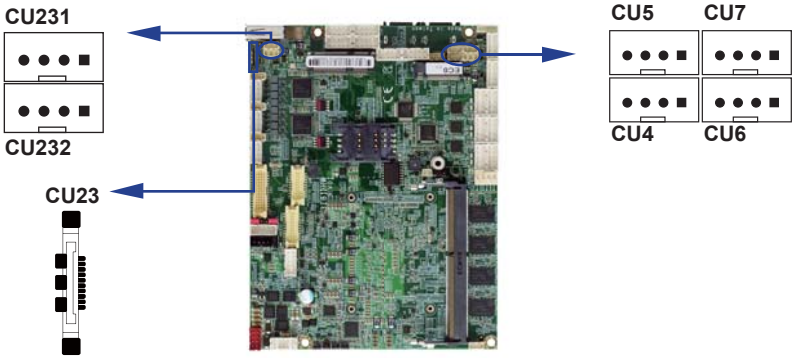
| PIN NO. | DESCRIPTION |
|---|---|
| 1 | USB31_P3_TX_DP |
| 2 | USB31_P3_TX_DN |
| 3 | GND |
| 4 | USB31_P3_RX_DP |
| 5 | USB31_P3_RX_DN |
| 6 | GND |
| 7 | USB31_P4_TX_DP |
| 8 | USB31_P4_TX_DN |
| 9 | USB31_P4_RX_DP |
| 10 | USB31_P4_RX_DN |

Note: 1. Can use CU002 connector Board to USB 3.0 Type A connector.

**● CU231 / CU232 / CU4 / CU5 / CU6 / CU7: USB 2.0 port 1x4pin (1.25mm) Wafer**

| PIN NO. | DESCRIPTION |
|---|---|
| 1 | +5V |
| 2 | DATA- |
| 3 | DATA+ |
| 4 | GND |

Note: 1. CU231 / CU232 must connector to CU002, the USB 3.0 Type A can be work.



## 3-10 LAN Interface

**• CL1 / CL2 / CL3: LAN 2x4pin (2.0mm) Wafer**

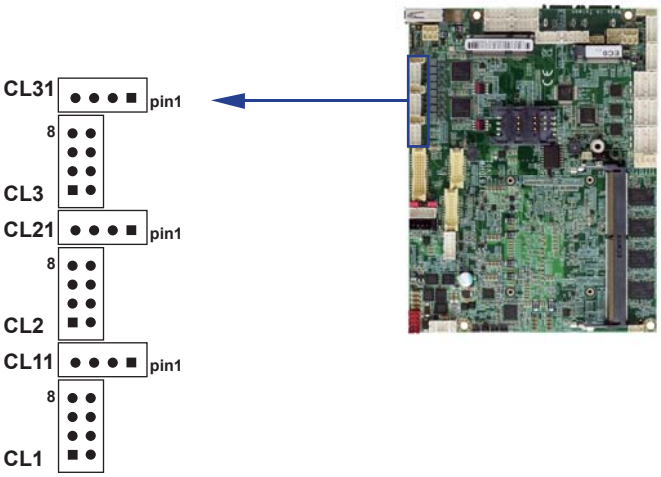
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | MDI0- | 5 | MDI0+ |
| 2 | MDI2+ | 6 | MDI1+ |
| 3 | MDI1- | 7 | MDI2- |
| 4 | MDI3- | 8 | MDI3+ |

Note: Can use CL001 connector Board to RJ45

**• CL11 / CL21 / CL31: LAN LED 1x4pin (1.25mm) Wafer**

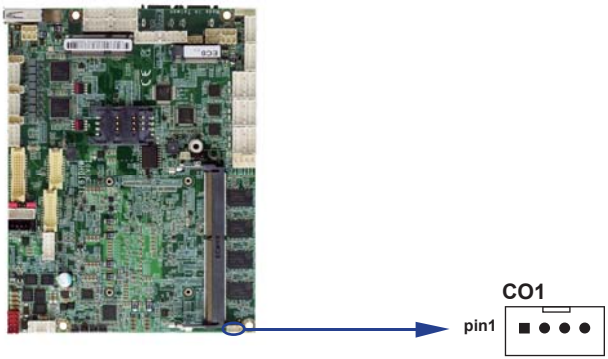
| PIN NO. | DESCRIPTION |
|---|---|
| 1 | VCC |
| 2 | Speed 10M |
| 3 | Speed 100M |
| 4 | Speed 1000M |

Note: Can use CL001 connector Board to RJ45



## 3-11 CO1: I²C 1x4pin (1.25mm) Wafer

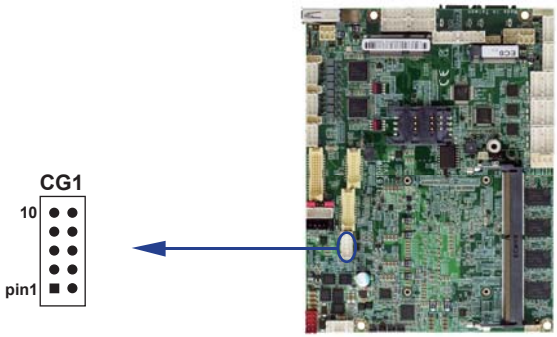
| PIN NO. | DESCRIPTION |
|---|---|
| 1 | +3.3V |
| 2 | GND |
| 3 | I²C Clock |
| 4 | I²C DATA |




## 3-12 Display Interface

**• CG1: VGA 2x5pin (2.0mm) Wafer**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | BULE | 2 | GND |
| 3 | GND | 4 | DDC CLOCK |
| 5 | GREEN | 6 | V-SYNC |
| 7 | GND | 8 | H-SYNC |
| 9 | GND | 10 | DDC DATA |



- **HDMI1: HDMI 2x10pin (1.25mm) Wafer**

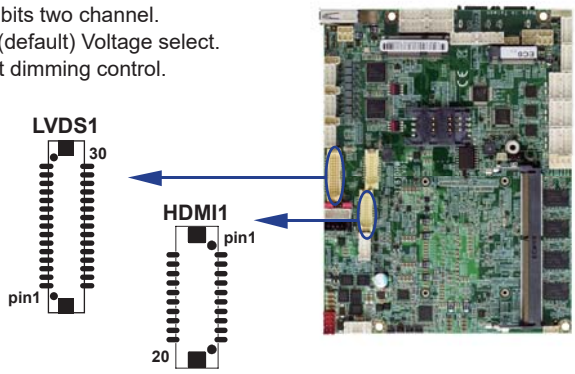
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | TMDS_D2_N | 2 | NC |
| 3 | TMDS_D2_P | 4 | NC |
| 5 | TMDS_D1_N | 6 | GND |
| 7 | TMDS_D1_P | 8 | GND |
| 9 | TMDS_D0_N | 10 | GND |
| 11 | TMDS_D0_P | 12 | GND |
| 13 | TMDS_CLK_N | 14 | +5V |
| 15 | TMDS_CLK_P | 16 | +5V |
| 17 | CLOCK | 18 | +5V |
| 19 | DATA | 20 | Hot Plug Detect |

Note: 1. Can use CN040 connector Board to HDMI Type A

- **LVDS1: LVDS 2x15pin (1.25mm) Wafer**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | PWM dimming | 2 | +5V |
| 3 | +LCD(5V or 3.3V) | 4 | +LCD(5V or 3.3V) |
| 5 | Channel-1-DATA3+ | 6 | Channel-0-DATA3+ |
| 7 | Channel-1-DATA3- | 8 | Channel-0-DATA3- |
| 9 | Channel-0-DATA2+ | 10 | Channel-0-CLK+ |
| 11 | Channel-0-DATA2- | 12 | Channel-0-CLK- |
| 13 | GND | 14 | GND |
| 15 | Channel-0-DATA1+ | 16 | Channel-0-DATA0+ |
| 17 | Channel-0-DATA1- | 18 | Channel-0-DATA0- |
| 19 | GND | 20 | GND |
| 21 | +LCD(5V or 3.3V) | 22 | +LCD(5V or 3.3V) |
| 23 | Channel-1-DATA2+ | 24 | Channel-1-CLK+ |
| 25 | Channel-1-DATA2- | 26 | Channel-1-CLK- |
| 27 | Channel-1-DATA1+ | 28 | Channel-1-DATA0+ |
| 29 | Channel-1-DATA1- | 30 | Channel-1-DATA0- |

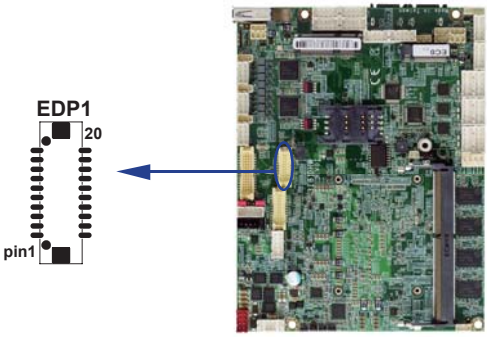
Note:
1. LVDS interface supports 18 / 24bits two channel.
2. JVL1: LVDS panel +5V / +3.3V (default) Voltage select.
3. LVDS1 PIN 1 for panel backlight dimming control.



● **EDP1: eDP 2x10pin (1.25mm) Wafer (Option)**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | Lane-0-DATA- | 2 | +12V or +5V |
| 3 | Lane-0-DATA+ | 4 | +12V or +5V |
| 5 | Lane-1-DATA- | 6 | GND |
| 7 | Lane-1-DATA+ | 8 | GND |
| 9 | Backlight Enable | 10 | GND |
| 11 | PWM dimming for eDP | 12 | GND |
| 13 | I2C Clock | 14 | +LCD(5V or 3.3V) |
| 15 | I2C Data | 16 | +LCD(5V or 3.3V) |
| 17 | eDP Aux+ | 18 | +LCD(5V or 3.3V) |
| 19 | eDP Aux- | 20 | EDP_HPD |

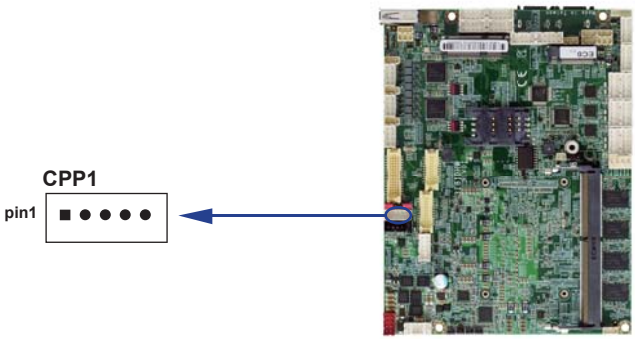
Note:
1. eDP interface support 2 lanes.
2. JVL1: eDP panel +5V / +3.3V (default) Voltage select.
3. eDP1 PIN 9 for panel backlight enable. +3.3V Level
4. eDP1 PIN 11 for panel backlight SOC dimming control
5. eDP1 PIN 2, 4 backlight power default set +12V



## 3-13 CPP1: Panel inverter power connector 1x5pin (2.0mm) Wafer

| PIN NO. | DESCRIPTION |
|---|---|
| 1 | +12V |
| 2 | GND |
| 3 | PWM dimming |
| 4 | ENBKL (3.3V) |
| 5 | ENBKL (5V) |

Note: 1. CPP1 PIN 3 and LVDS1 PIN1 is same signal.



## 3-14 CT1: USB Touch screen device 2x5pin (2.0mm) Wafer

- **For 8-wire type pin define**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | Bottom | 2 | Bottom Sense |
| 3 | Top Sense | 4 | Top |
| 5 | Right | 6 | Right Sense |
| 7 | Left | 8 | Left Sense |
| 9 | GND | 10 | NC |

Note: For eight wire type cable Pin 3 and Pin 4 need short.

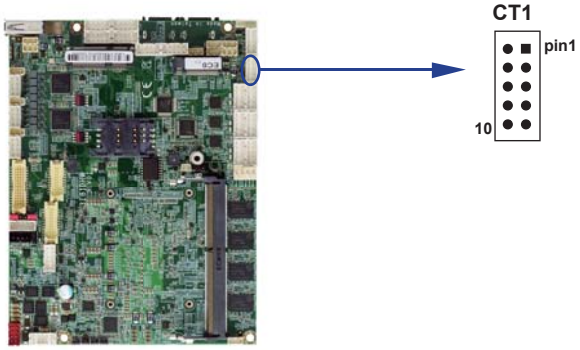
- **For 4-wire type pin define**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | Bottom | 2 | N/A |
| 3 | N/A | 4 | Top |
| 5 | Right | 6 | N/A |
| 7 | Left | 8 | N/A |
| 9 | GND | 10 | NC |

Note: For four wire type cable Pin 3 and Pin 4 need short.

- **For 5-wire type pin define**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | UR(H) | 2 | N/A |
| 3 | Sense | 4 | UL(Y) |
| 5 | LR(X) | 6 | N/A |
| 7 | LL(L) | 8 | N/A |
| 9 | GND | 10 | NC |



## 3-15 CPI1: DC Power input (2x4pin 2.0mm Wafer) (Red)

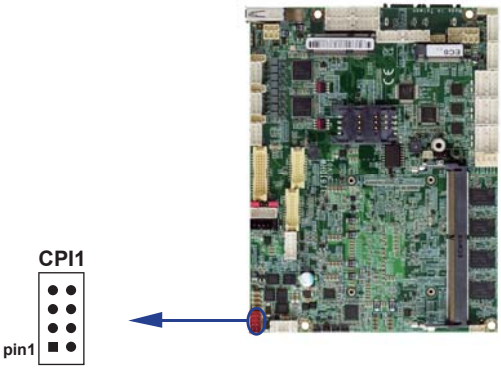
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | GND | 2 | GND |
| 3 | DC-IN | 4 | DC-IN |
| 5 | DC-IN | 6 | DC-IN |
| 7 | GND | 8 | GND |

**Note:**

**1. Very important check DC-in Voltage type for 12V, 24V or 9~36V model spec.**

**2. If use 3cell battery, the input Voltage must be at least +15V.**

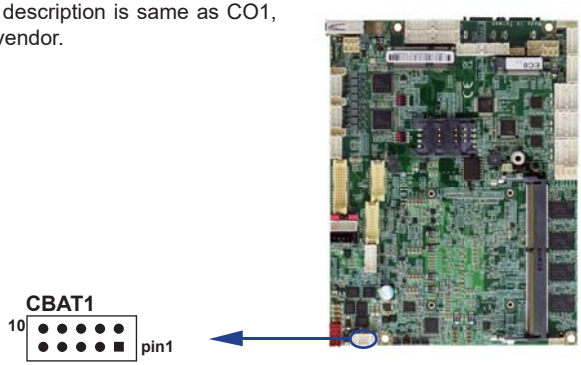
**3. If use 4cell battery, the input Voltage must be at least +19V.**




## 3-16 CBAT1: Battery charge In 2x5pin (2.0mm) Wafer

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | BAT VCC | 2 | BAT VCC |
| 3 | GND | 4 | BAT VCC |
| 5 | SMB_CLK | 6 | BAT VCC |
| 7 | SMB_DATA | 8 | GND |
| 9 | GND | 10 | GND |

Note: Please check Battery pin description is same as CO1, if your battery got from another vendor.



## 3-17 Battery LED

- **JSE1: Battery Discharge LED 1x2pin (2.0mm) Pin Header**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | LED+ | 2 | LED- |

- **JSE2: Battery Output LED 1x2pin (2.0mm) Pin Header**

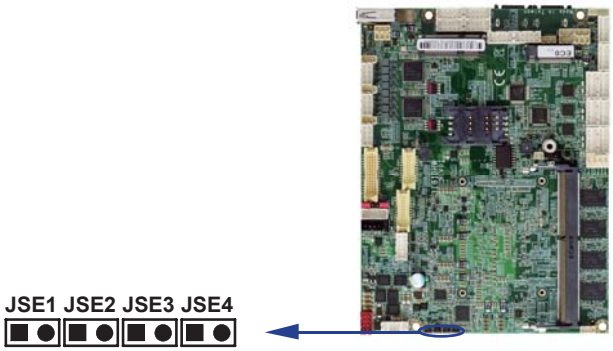
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | LED+ | 2 | LED- |

- **JSE3: Battery charge LED 1x2pin (2.0mm) Pin Header**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | LED+ | 2 | LED- |

- **JSE4: Battery Full charged LED 1x2pin (2.0mm) Pin Header**

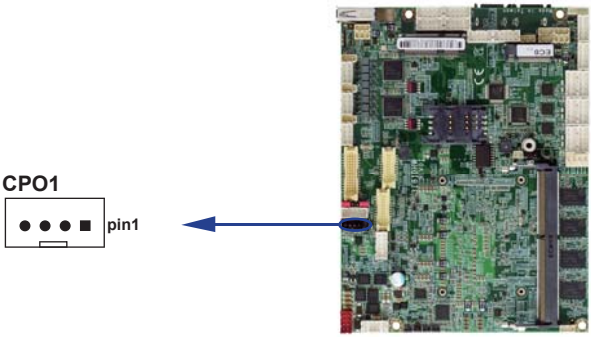
| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | LED+ | 2 | LED- |



## 3-18 CPO1: DC +5 / +12V output 1x4pin (2.0mm) Black Wafer

| PIN NO. | DESCRIPTION |
|---|---|
| 1 | +5V |
| 2 | GND |
| 3 | GND |
| 4 | +12V |

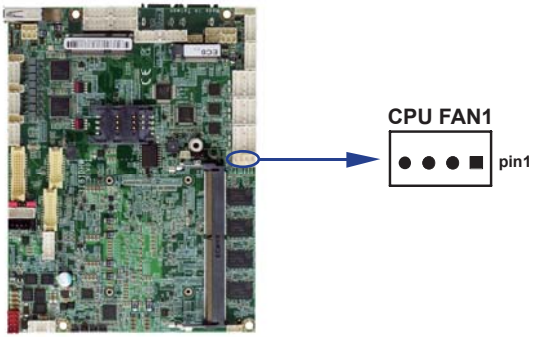
Note: Attention! Check Device Power in spec




## 3-19 FAN1: CPU Fan 1x4pin (2.54mm) Wafer

| PIN NO. | DESCRIPTION |
|---|---|
| 1 | GND |
| 2 | +12V |
| 3 | CPUFAN-IN |
| 4 | CPUFAN-OUT |

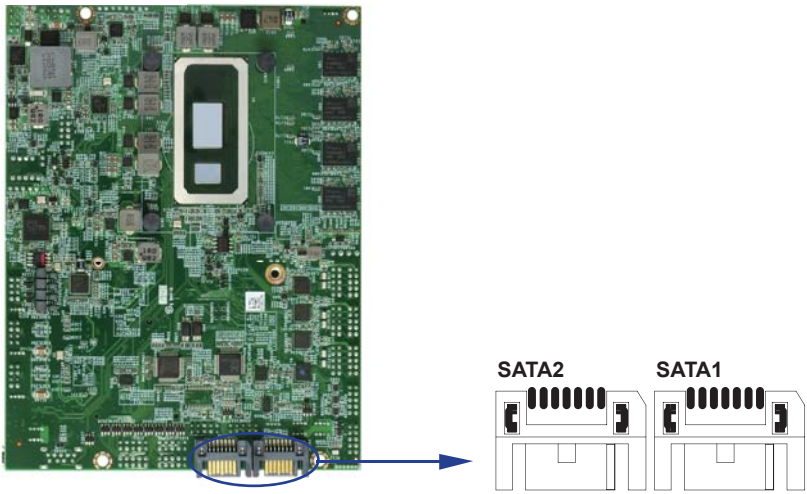
Note:
DC in +12V by switch to FAN power +12V,
so DC in need stable +12V input



## 3-20 SATA1 / SATA2: SATA port connectors 7pin

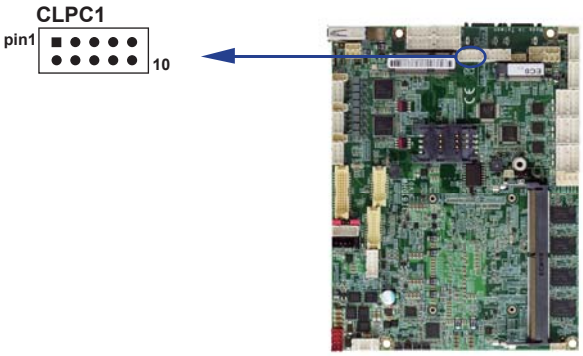
| PIN NO. | DESCRIPTION |
|---|---|
| 1 | GND |
| 2 | TX+ |
| 3 | TX- |
| 4 | GND |
| 5 | RX- |
| 6 | RX+ |
| 7 | GND |

Note:
1. CPO1 provides SATA HDD power +12V, GND, +5V
2. SATA2 for Option (signal share with MPCE1).



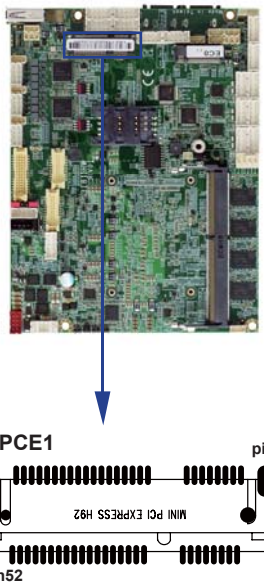
## 3-21 CLPC1: Low Pin Count 2x5pin (2.0mm) Wafer

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | LPC_AD3 | 2 | LPC_CLK |
| 3 | LPC_AD2 | 4 | LPC_FRAME |
| 5 | LPC_AD1 | 6 | PLT_RST |
| 7 | LPC_AD0 | 8 | LPC_SERIRQ |
| 9 | GND | 10 | +3.3V |



## 3-22 MPCE1 PCI Express mini card sockets 52pin

| PIN NO. | Description | PIN NO. | Description |
|---|---|---|---|
| 1 | NC | 2 | +3.3V |
| 3 | NC | 4 | GND |
| 5 | NC | 6 | +1.5V |
| 7 | NC | 8 | NC |
| 9 | GND | 10 | NC |
| 11 | PCIe-CLK- | 12 | NC |
| 13 | PCIe-CLK+ | 14 | NC |
| 15 | GND | 16 | NC |
| KEY | | | |
| 17 | NC | 18 | GND |
| 19 | NC | 20 | NC |
| 21 | GND | 22 | Reset |
| 23 | PCIe-RX- / mSATA-RX+ / USB3_RX- | 24 | +3.3V |
| 25 | PCIe-RX+ / mSATA-RX- / USB3_RX+ | 26 | GND |
| 27 | GND | 28 | +1.5V |
| 29 | GND | 30 | SMB-CLK |
| 31 | PCIe-TX- / mSATA-TX- / USB3_TX- | 32 | SMB-DATA |
| 33 | PCIe-TX+ / mSATA-TX+ / USB3_TX+ | 34 | GND |
| 35 | GND | 36 | USB-DATA- |
| 37 | GND | 38 | USB-DATA+ |
| 39 | +3.3V | 40 | GND |
| 41 | +3.3V | 42 | NC |
| 43 | GND | 44 | NC |
| 45 | NC | 46 | NC |
| 47 | NC | 48 | +1.5V |
| 49 | NC | 50 | GND |
| 51 | mSATA / PCIe detect | 52 | +3.3V |




Note:
1. Pin51 mSATA / PCIe auto detect function.
2. If use USB 3.0 signal, used BIOS select default set mSATA / PCIe.

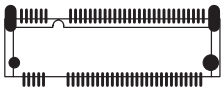
## 3-23 NGFF1 M.2 NGFF card B key sockets 75pin

**• NGFF1: size 3042 (H=8.5)**

| PIN NO. | Description | PIN NO. | Description |
|---|---|---|---|
| 1 | CFG3_USB3_PCIE_N | 2 | +3.3V |
| 3 | GND | 4 | +3.3V |
| 5 | GND | 6 | FULL_CARD_PWR_N |
| 7 | USB2_P9_DP | 8 | W_DISABLE_1_N |
| 9 | USB2_P9_DN | 10 | M2_LED_N |
| 11 | GND | | |
| B KEY | | | |
| 21 | GND | 20 | NC |
| 23 | NC | 22 | NC |
| 25 | NC | 24 | NC |
| 27 | GND | 26 | W_DISABLE_2_N |
| 29 | M2_PERn1_U3Rn | 28 | NC |
| 31 | M2_PERp1_U3Rp | 30 | SIM_RST_M2 |
| 33 | GND | 32 | SIM_CLK_M2 |
| 35 | M2_PETn1_U3Tn | 34 | SIM_DATA_M2 |
| 37 | M2_PETp1_U3Tp | 36 | SIM_PWR_M2 |
| 39 | GND | 38 | DEVSLP |
| 41 | M2_PERn0_MSRp | 40 | NC |
| 43 | M2_PERp0_MSRn | 42 | NC |
| 45 | GND | 44 | NC |
| 47 | M2_PETn0_MSTn | 46 | NC |
| 49 | M2_PETp0_MSTp | 48 | NC |
| 51 | GND | 50 | M2_PRST_N |
| 53 | REFCLK_N | 52 | SRCCLKREQ5_N |
| 55 | REFCLK_P | 54 | NC |
| 57 | GND | 56 | NC |
| 59 | NC | 58 | NC |
| 61 | NC | 60 | NC |
| 63 | NC | 62 | NC |
| 65 | NC | 64 | NC |
| 67 | MD_RESET_N | 66 | SIM_DET |
| 69 | PCIe_SATA#_DET | 68 | NC |
| 71 | GND | 70 | +3.3V |
| 73 | GND | 72 | +3.3V |
| 75 | GND | 74 | +3.3V |



**NGFF1**

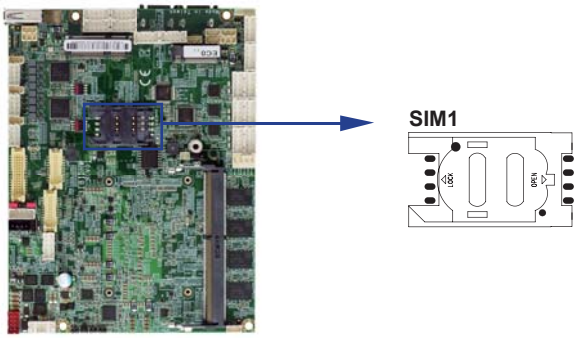


Note:
1. NGFF1 support mSATA / PCIe Auto detect.
2. If use WWAN PCIe pin69 need to NC (BOM control)
3. M.2 SIM card function is OEM option (BOM control)

## 3-24 SIM1: SIM card socket

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | VCC | 5 | GND |
| 2 | RST | 6 | VPP |
| 3 | CLK | 7 | DATA |
| 4 | RFU | 8 | RFU |

Note:
1. MPCE1 Pin 8, 10, 12, 14, 16 for SIM card reader use.
2. SIM1 default support MPCE1, if M.2 use need OEM option.



## 3-25 Connector wafer of Compatible Brand and part number list

| Location | CKTS | PITCH | Brand Name | Mating connector | Cable housing |
|---|---|---|---|---|---|
| CA1 | 2x5 10Pin | 2.0mm | JST | B10B-PHDSS | PHDR-10VS |
| CALR1 | 1x4 4Pin | 1.25mm | MOLEX | 53047-0410 | 51021-0400 |
| CG1 | 2x5 10Pin | 2.0mm | JST | B10B-PHDSS | PHDR-10VS |
| CC1~CC6 | 2x5 10Pin | 2.0mm | JST | B10B-PHDSS | PHDR-10VS |
| CFP1 | 2x5 10Pin | 2.0mm | JST | B10B-PHDSS | PHDR-10VS |
| CIO1~CIO4 | 2x5 10Pin | 2.0mm | JST | B10B-PHDSS | PHDR-10VS |
| CPI1 | 2x4 8Pin | 2.0mm | JST | B8B-PHDSS | PHDR-08VS |
| CPO1 | 1x4 4Pin | 2.0mm | JST | B4B-PH-KL | PHR-4 |
| CO1 | 1x4 4Pin | 1.25mm | MOLEX | 53047-0410 | 51021-0400 |
| CU23 | 1x10 10Pin | 0.5mm | KEL | SSL00-10S | SSL20-10SSB-010-BH |
| CU231, CU232 | 1x4 4Pin | 1.25mm | MOLEX | 53047-0410 | 51021-0400 |
| CU4~CU7 | 1x4 4Pin | 1.25mm | MOLEX | 53047-0410 | 51021-0400 |
| CBT1 | 1x2 2Pin | 1.25mm | MOLEX | 53047-0210 | 51021-0200 |
| CKM1 | 1x6 6Pin | 1.25mm | MOLEX | 53047-0610 | 51021-0600 |
| LVDS1 | 2x15 30Pin | 1.25mm | HIROSE | DF13-30DS-1.25C | DF13-30DP-1.25V |
| HDMI1 | 2x10 20Pin | 1.25mm | HIROSE | DF13-20DS-1.25C | DF13-20DP-1.25V |
| CT1 | 2x5 10Pin | 2.00mm | JST | B10B-PHDSS | PHDR-10VS |
| CPP1 | 1x5 5Pin | 2.0mm | JST | B5B-PH-KL | PHR-5 |

# Chapter-4

## Introduction of BIOS

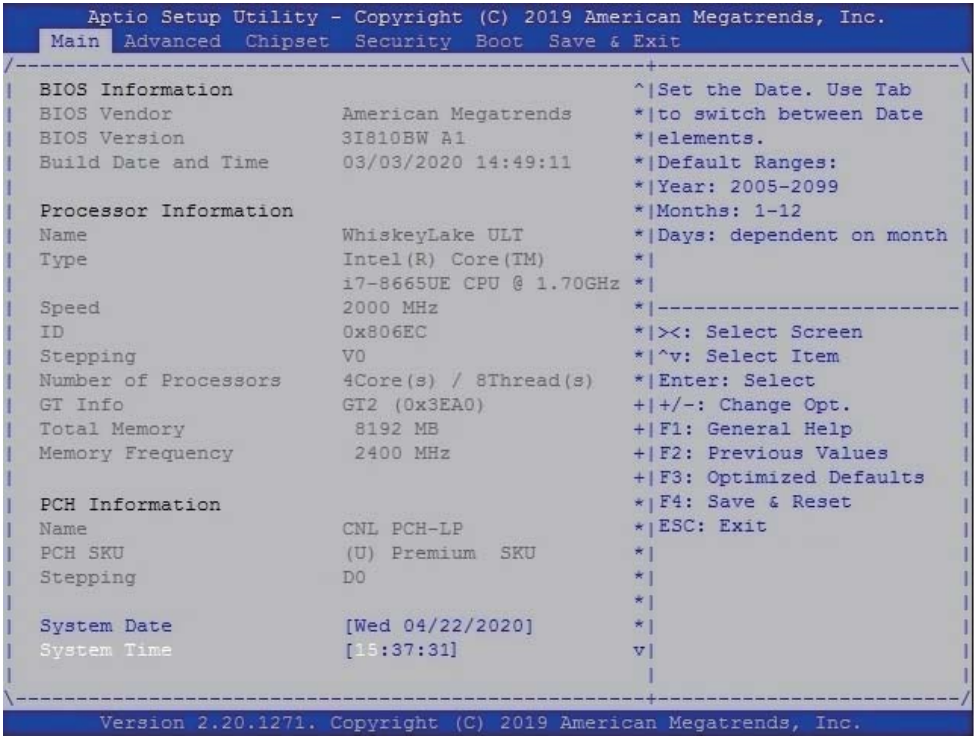
The BIOS is a program located in the Flash Memory on the motherboard.
This program is a bridge between motherboard and operating system.
When you start the computer, the BIOS program gains control.
The BIOS first operates an auto-diagnostic test called POST (Power on Self Test) for all the necessary hardware, it detects the entire hardware devices and configures the parameters of the hardware synchronization. After these tasks are completed, BIOS will give control of the computer back to operating system (OS). Since the BIOS is the only channel for hardware and software to communicate with, it is the key factor of system stability and of ensuring your system performance at best.
In the BIOS Setup main menu, you can see several options. We will explain these options in the following pages. First, let us see the function keys you may use here:

Press <Esc> to quit the BIOS Setup.
Press ↑↓←→(up, down, left, right) to choose the option you want to confirm or modify.
Press <F10> to save these parameters and to exit the BIOS Setup menu after you complete the setup of BIOS parameters.
Press Page Up/Page Down or +/- keys to modify the BIOS parameters for the active option.

## 4-1 Enter Setup

Power on the computer and press <Del> key immediately to enter Setup.
If the message disappears before your respond but you still wish to enter Setup, restart the system by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart the system by simultaneously pressing <Ctrl>, <Alt> and <Delete> keys.

## 4-2 BIOS Menu Screen & Function Keys




In the above BIOS Setup main menu of, you can see several options.
We will explain these options step by step in the following pages of this chapter, but let us first see a short description of the function keys you may use here:

- Press >< (right, left) to select screen;
- Press ↑↓ (up, down) to choose, in the main menu, the option you want to confirm or to modify.
- Press <Enter> to select.
- Press <+>/<–> or <F5>/<F6> keys when you want to modify the BIOS parameters for the active option.
- [F1]: General help.
- [F2]: Previous values.
- [F3]: Optimized defaults.
- [F4]: Save & Reset.
- Press <Esc> to quit the BIOS Setup.

## 4-3 General Help




Status Page Setup Menu / Option Page Setup Menu

Press F1 to pop up a help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press <Esc>.

## 4-4 Menu Bars

There are six menu bars on top of BIOS screen:

Main To change system basic configuration

Advanced To change system advanced configuration

Chipset To change PCH IO configuration

Security Password settings

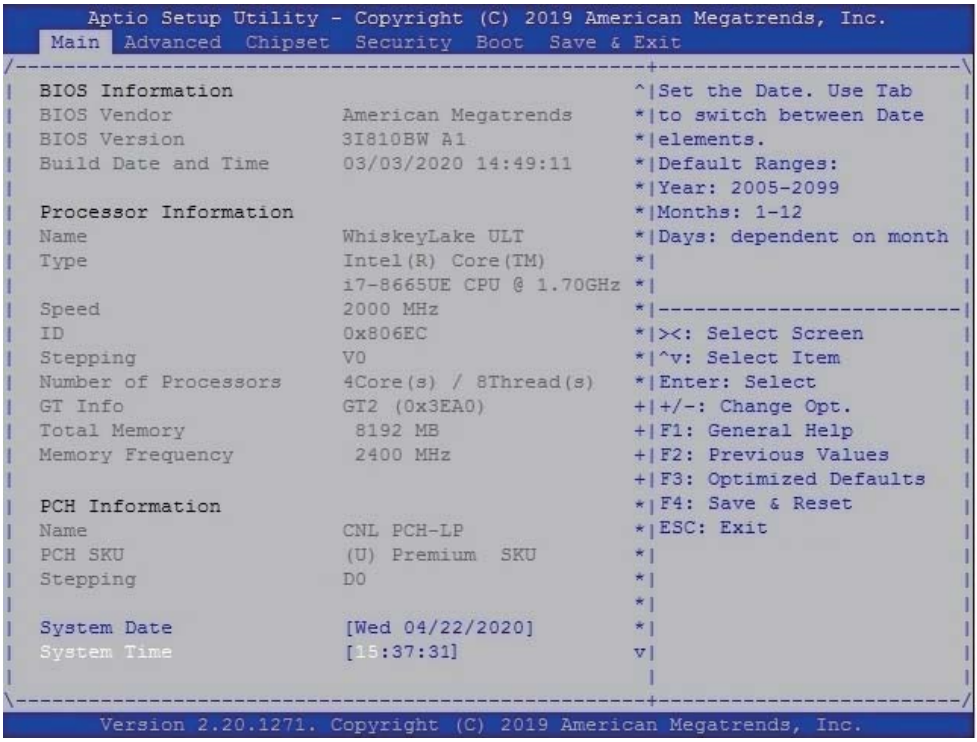
Boot Quiet boot or boot from USB selected.

Save & Exit Save setting, loading and exit options.

User can press the right or left arrow key on the keyboard to switch from menu bar.

The selected one is highlighted.

## 4-5 Main




Main menu screen includes some basic system information. Highlight the item and then use the <+> or <-> and numerical keyboard keys to select the value you want in each item.

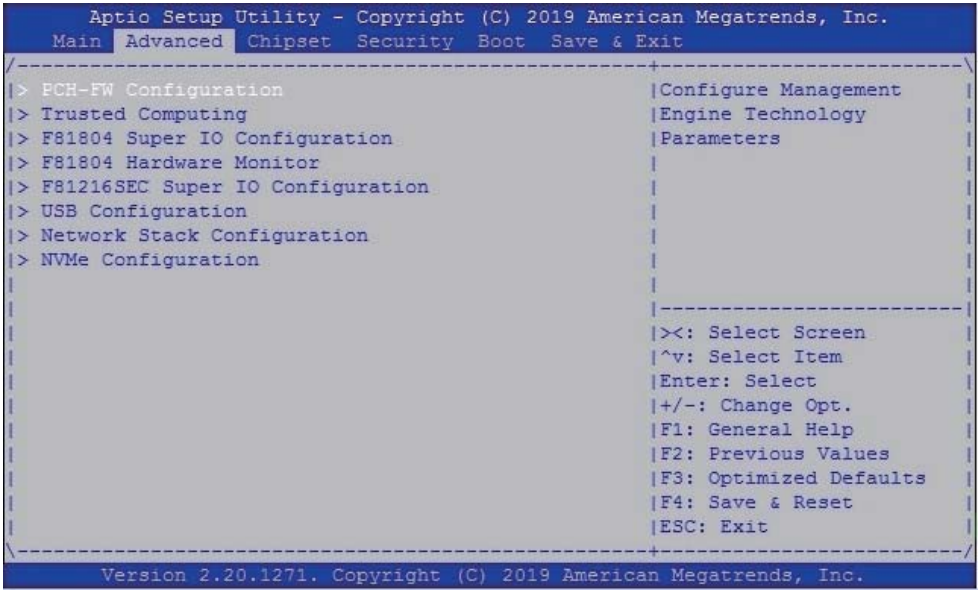
**System Date**

Set the Date. Please use [Tab] to switch between data elements.

**System Time**

Set the Time. Please use [Tab] to switch between data elements.

## 4-6 Advanced




**PCH-FW Configuration**
Please refer section 4-6-1

**Trusted Computing**
Please refer section 4-6-2

**F81804 Super IO Configuration**
Please refer section 4-6-3

**F81804 Hardware Monitor**
Please refer section 4-6-4

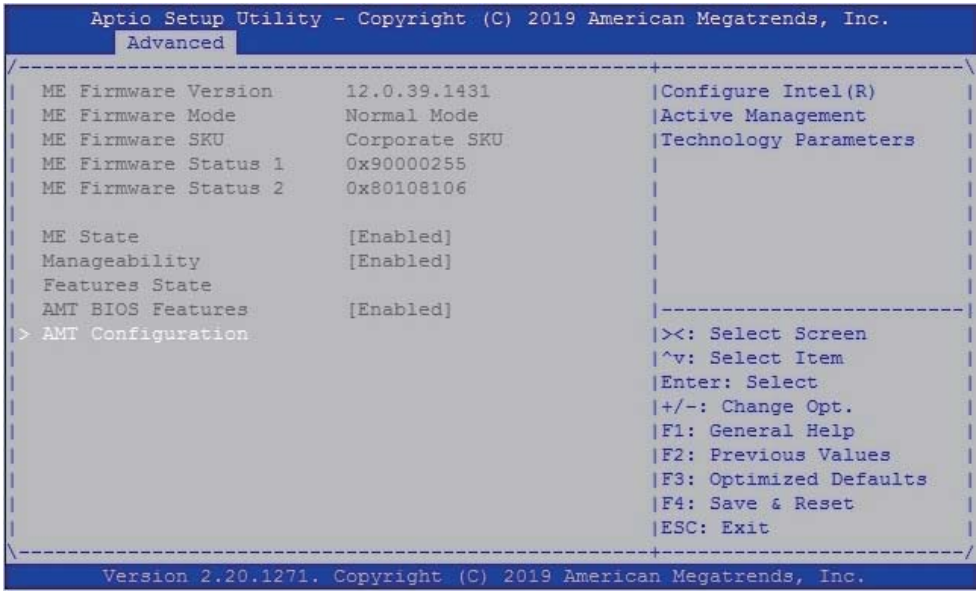
**F81206SEC Super IO Configuration**
Please refer section 4-6-5

**USB Configuration**
Please refer section 4-6-6

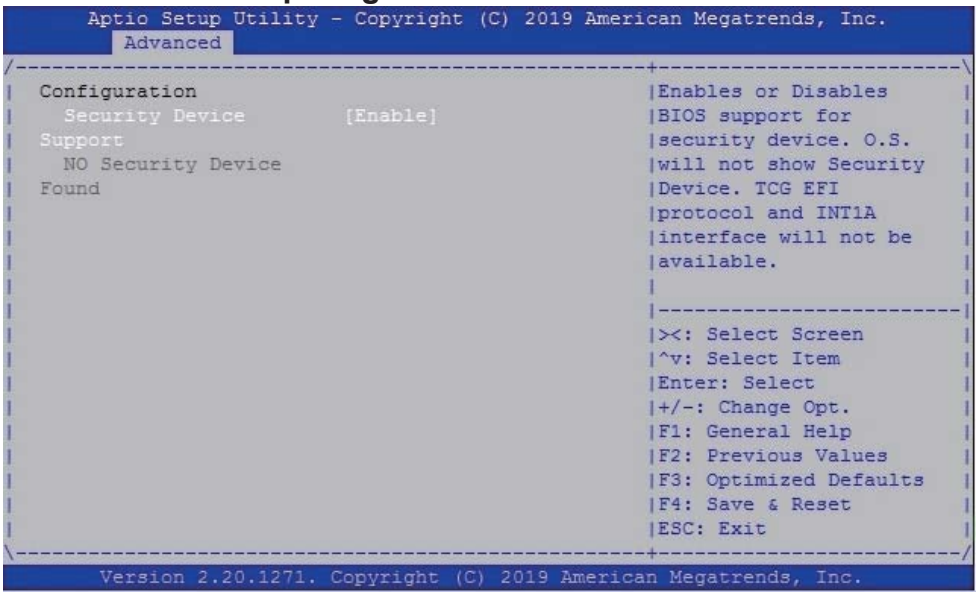
**Network Stack Configuration**
Please refer section 4-6-7

**NVMe Configuration**
Please refer section 4-6-8

## 4-6-1 PCH-FW Configuration



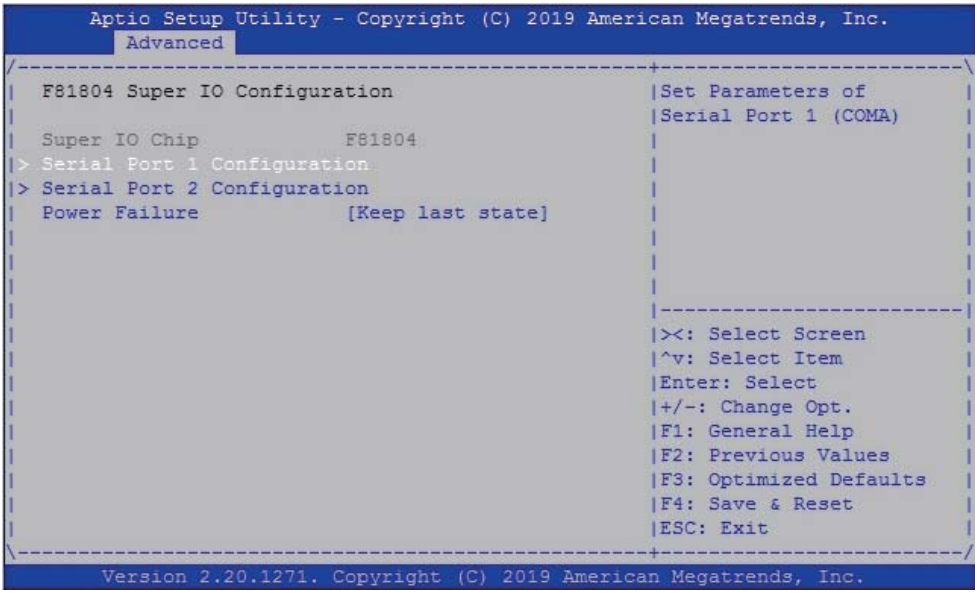

## 4-6-2 Trusted Computing




**Security Device Support**

To enable BIOS support security device or not, default is Enabled.

## 4-6-3 F81804 Super IO Configuration




**Serial Port 1 Configuration**

Please refer section 4-6-3-1

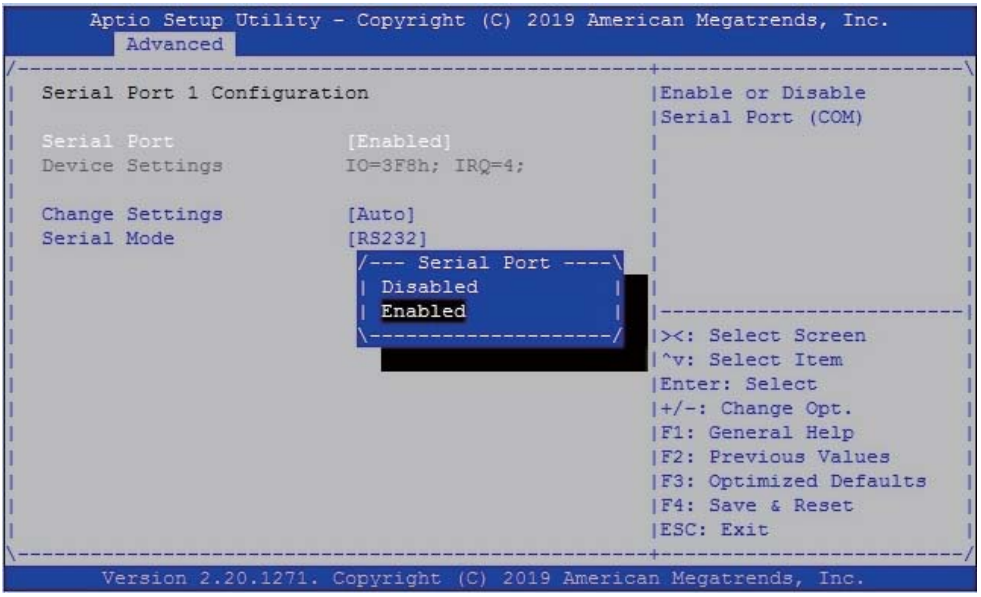
**Serial Port 2 Configuration**

Please refer section 4-6-3-2

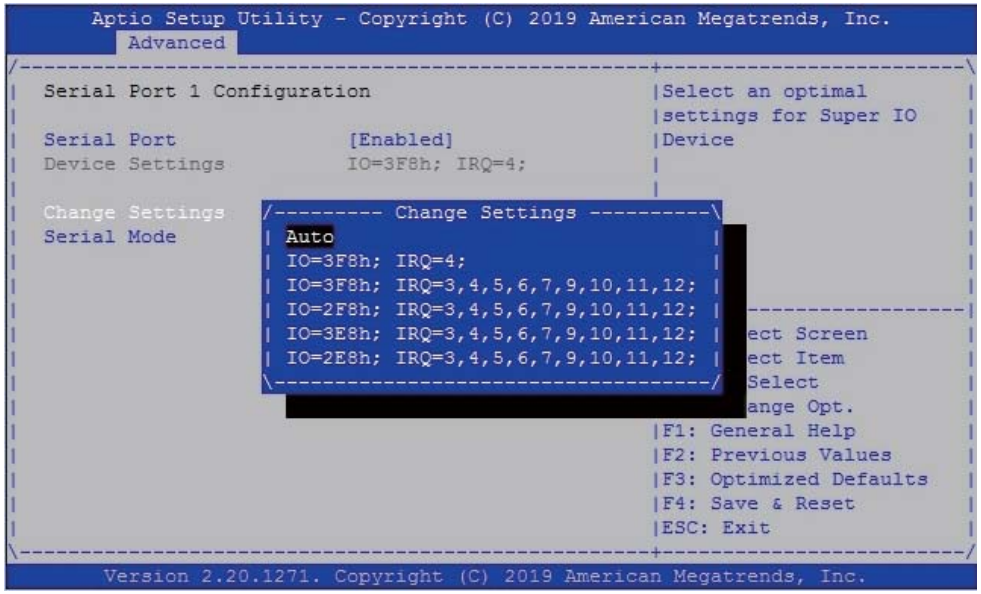
**Power Failure**

Please refer section 4-6-3-3

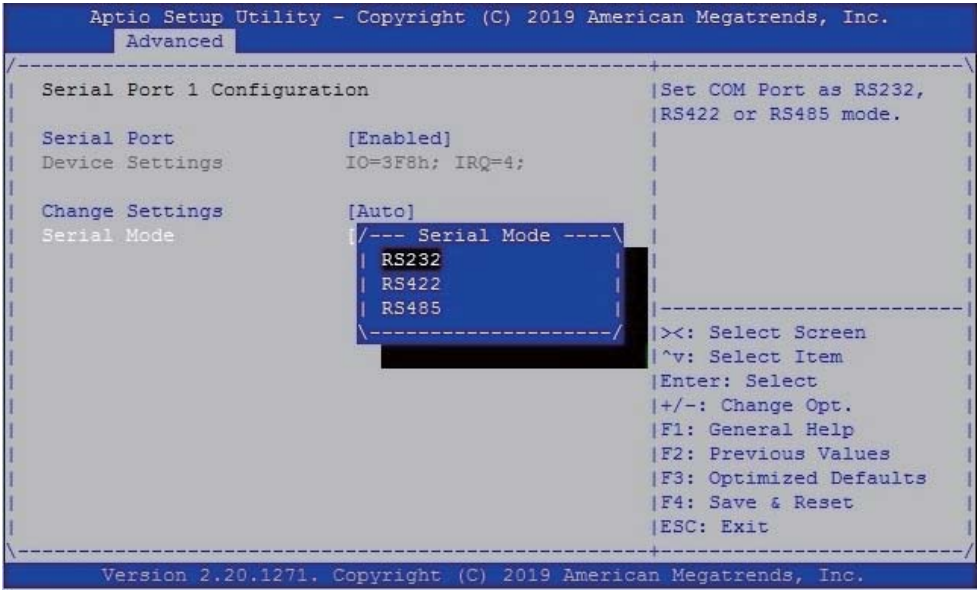
## 4-6-3-1 ► Serial Port 1 Configuration




To Enable Serial port or not, default is Enabled.

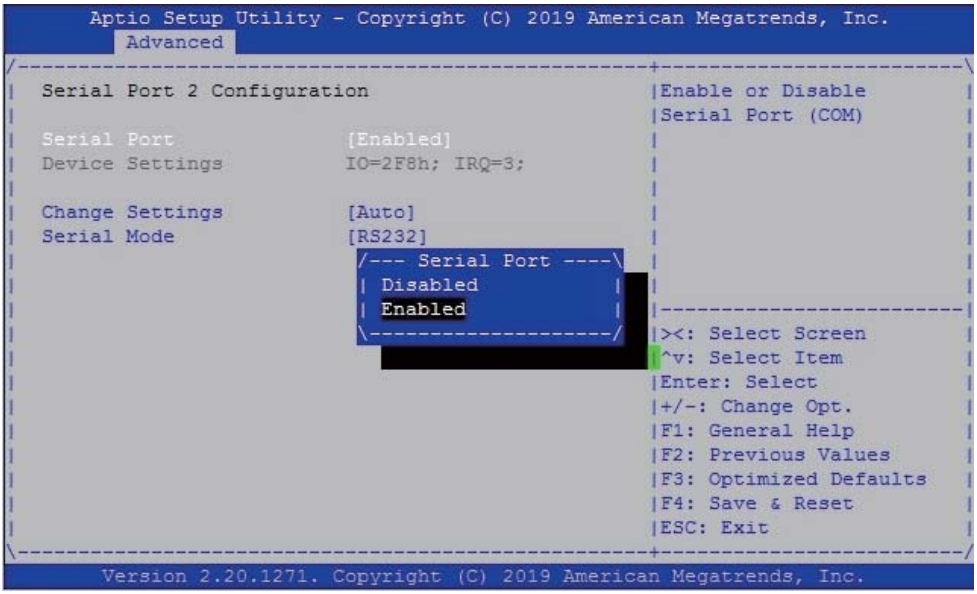



Change Settings, default is Auto.

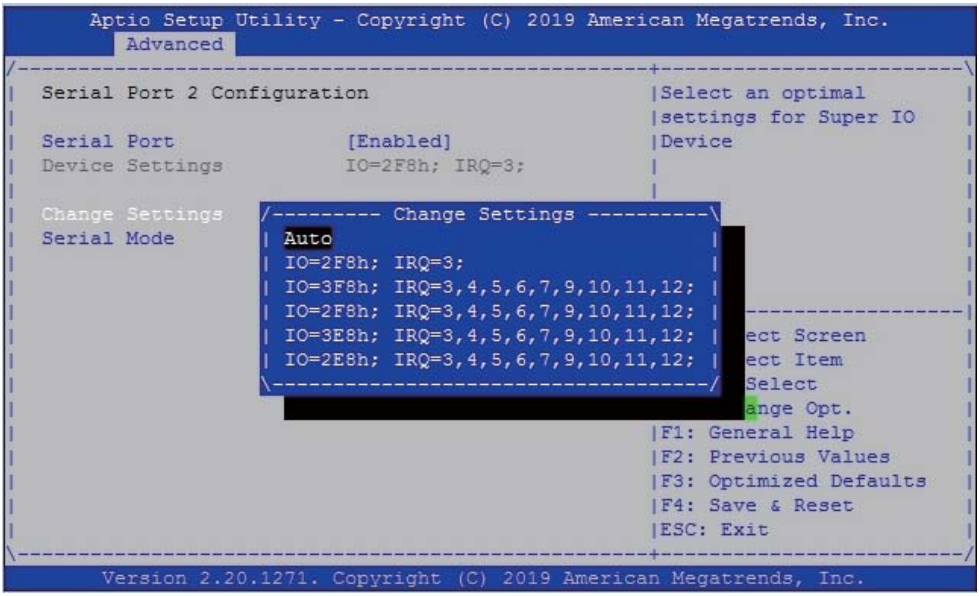



To select the Serial port to RS232 / RS422 / RS485, default is RS232.

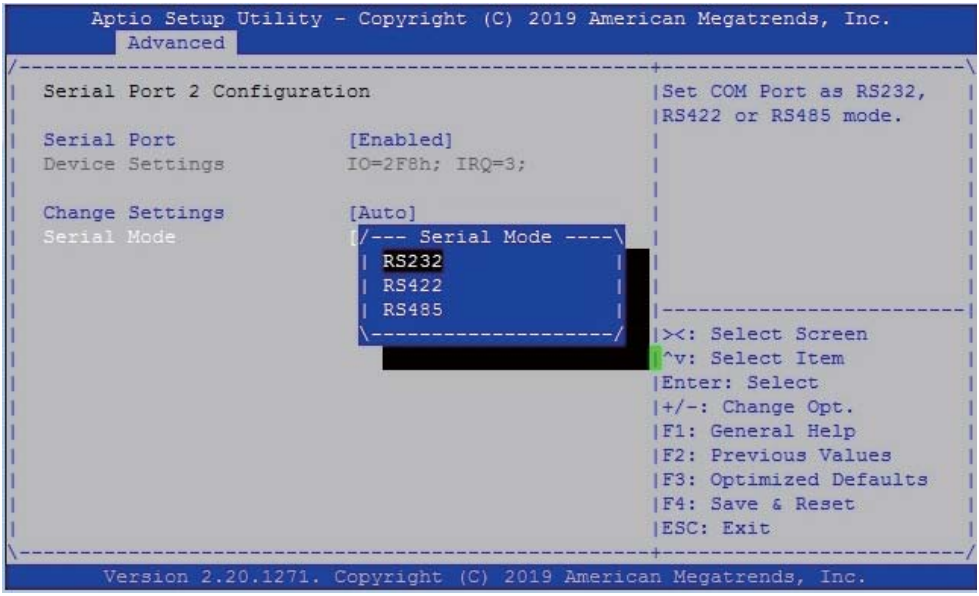
## 4-6-3-2 ► Serial Port 2 Configuration




To Enable Serial port or not, default is Enabled.

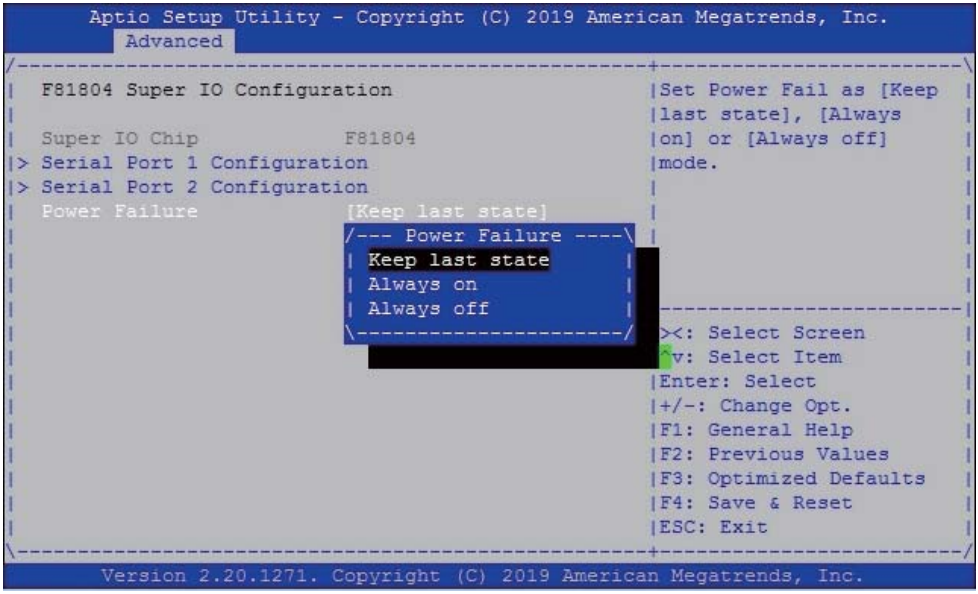



Change Settings, default is Auto.



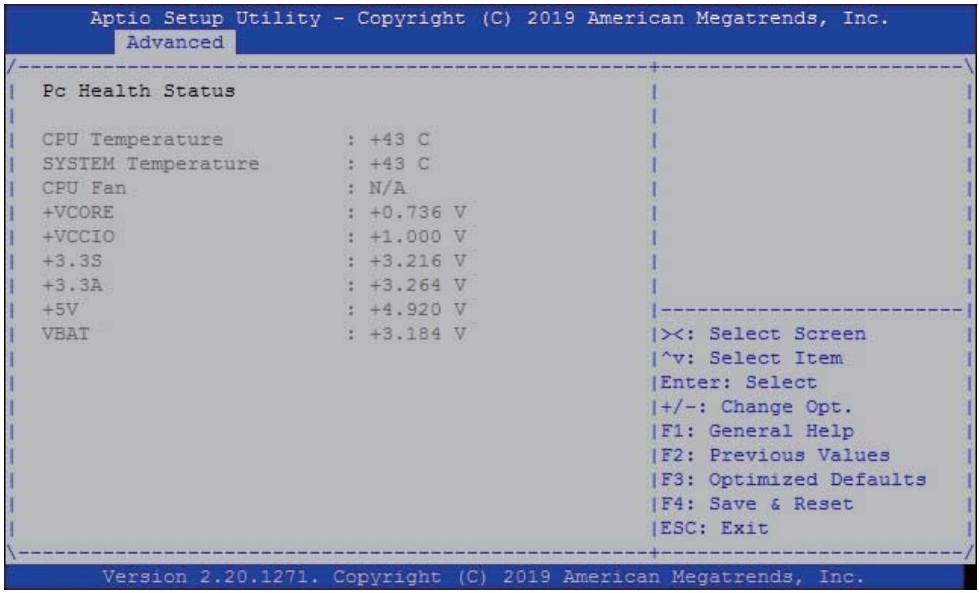

To select the Serial port to RS232 / RS422 / RS485, default is RS232.

## 4-6-3-3 ► Power Failure




To select the power behavior after power fail, default is Keep last state.

## 4-6-4 F81804 Hardware Monitor

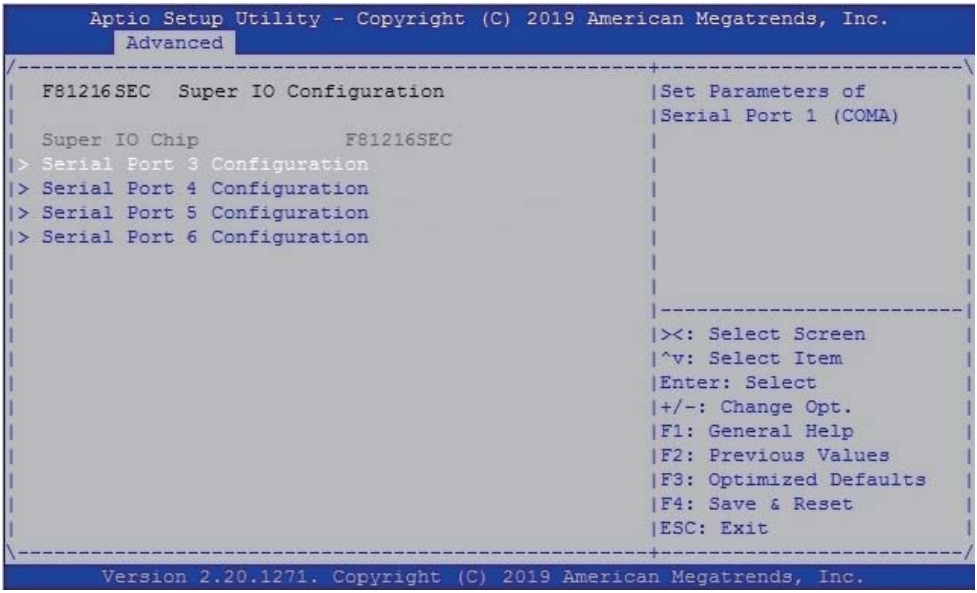



Press [Enter] to view PC health status.

This section shows the status of your CPU, Fan, and overall system.

This is only available when there is Hardware Monitor function onboard.

## 4-6-5 F81802SEC Super IO Configuration




**Serial Port 3 Configuration**

Please refer section 4-6-5-1

**Serial Port 4 Configuration**

Please refer section 4-6-5-2

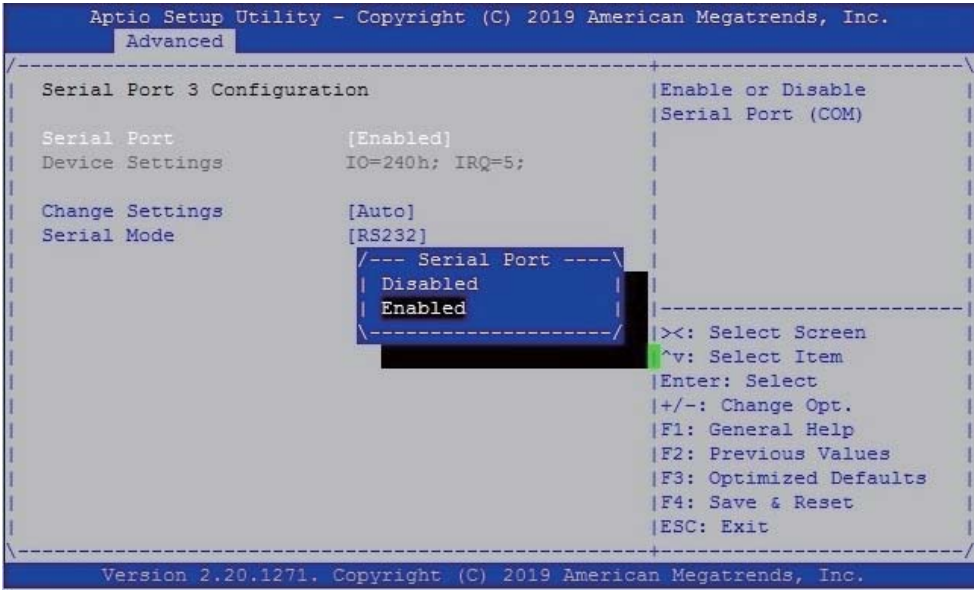
**Serial Port 5 Configuration**

Please refer section 4-6-5-3

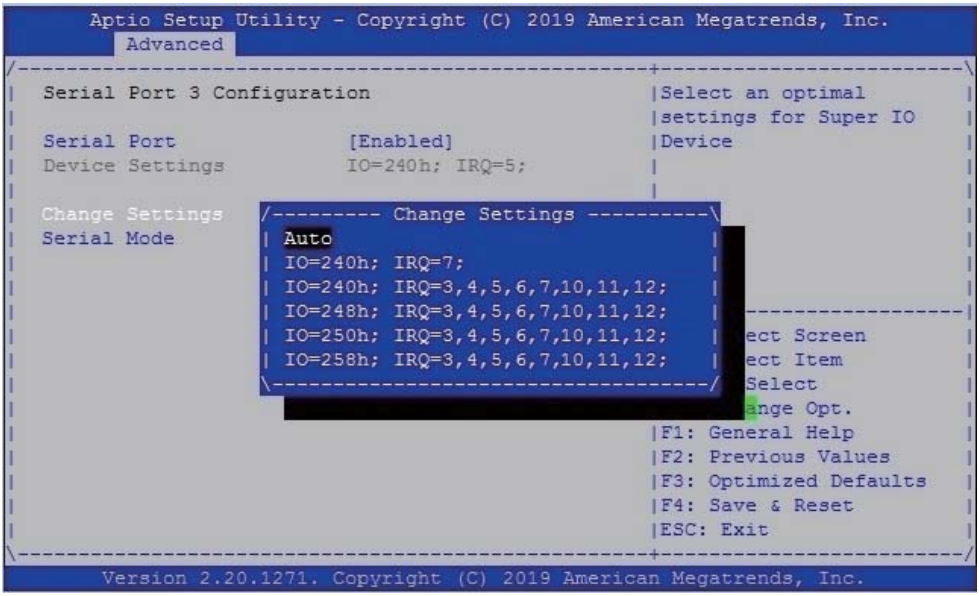
**Serial Port 6 Configuration**

Please refer section 4-6-5-4

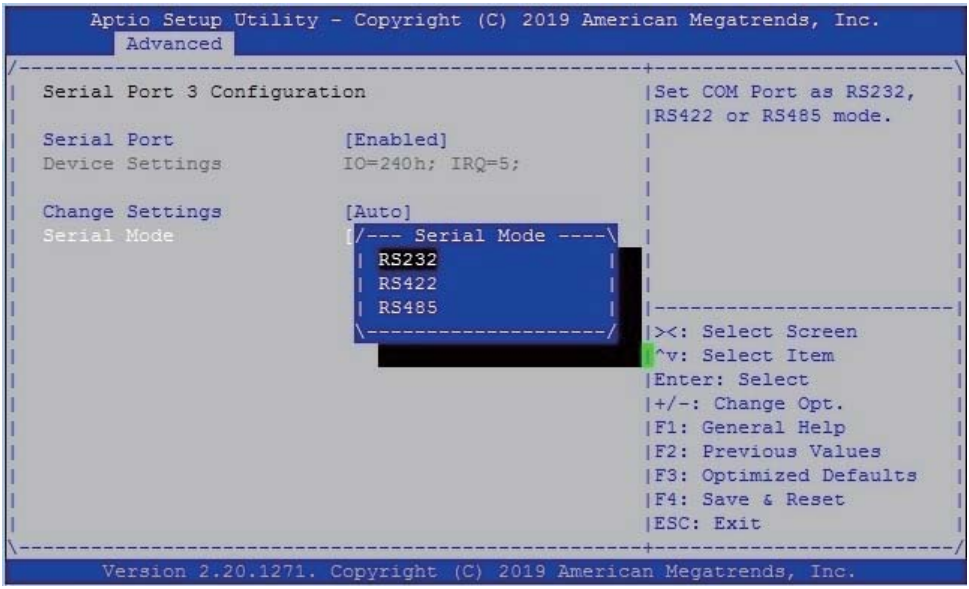
## 4-6-5-1 ► Serial Port 3 Configuration




To Enable Serial port or not, default is Enabled.

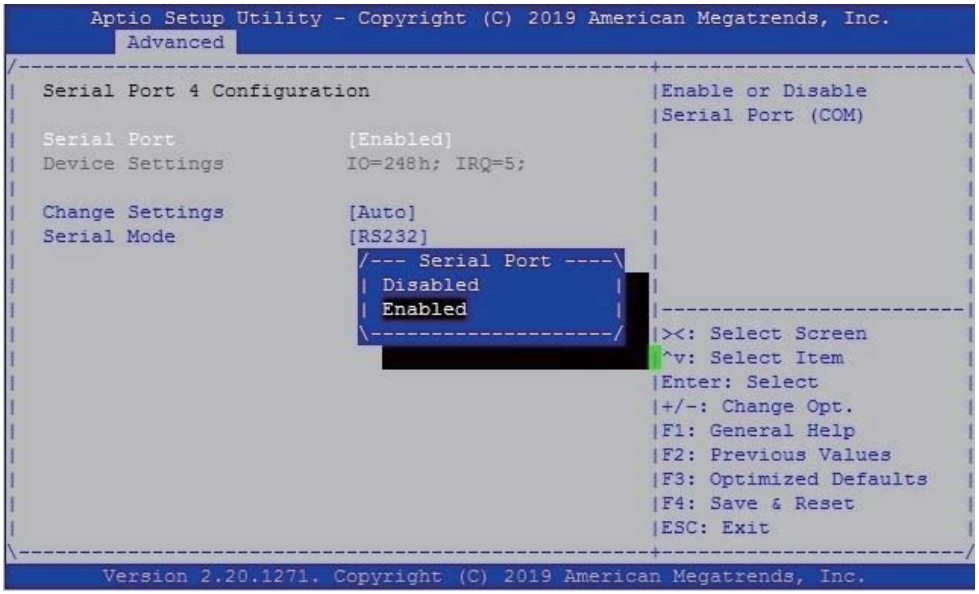



Change Settings, default is Auto.

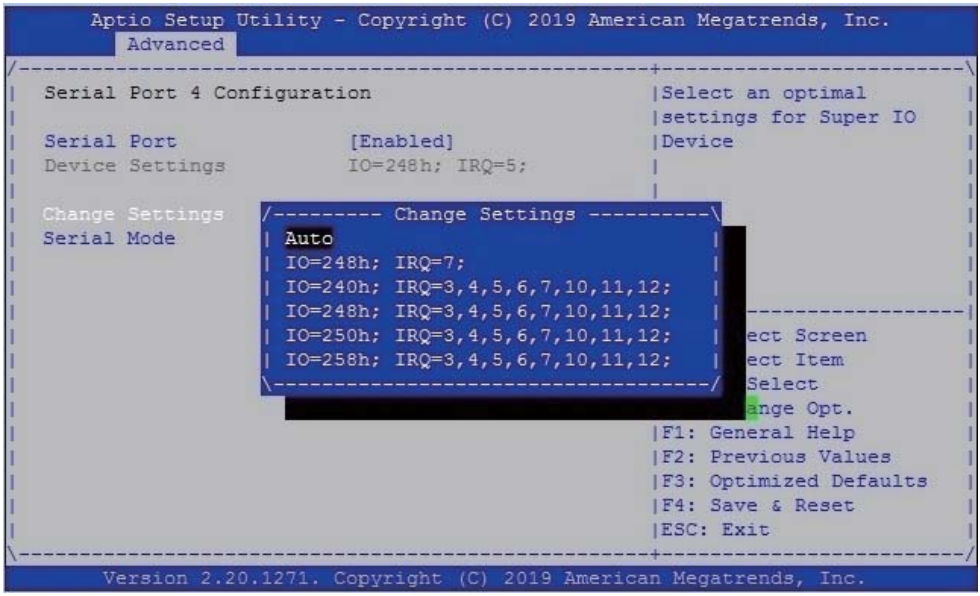



To select the Serial port to RS232 / RS422 / RS485, default is RS232.

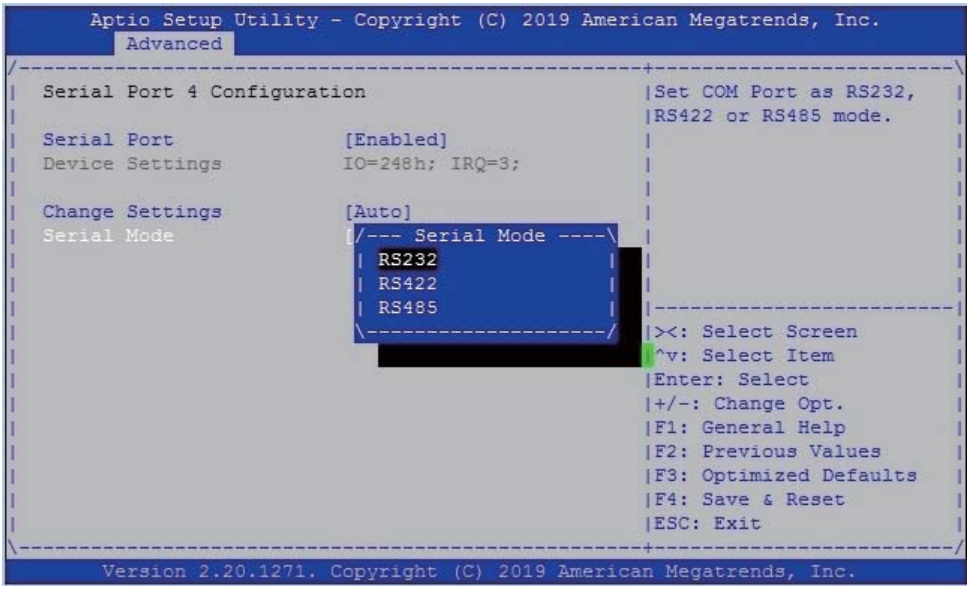
## 4-6-5-2 ► Serial Port 4 Configuration




To Enable Serial port or not, default is Enabled.

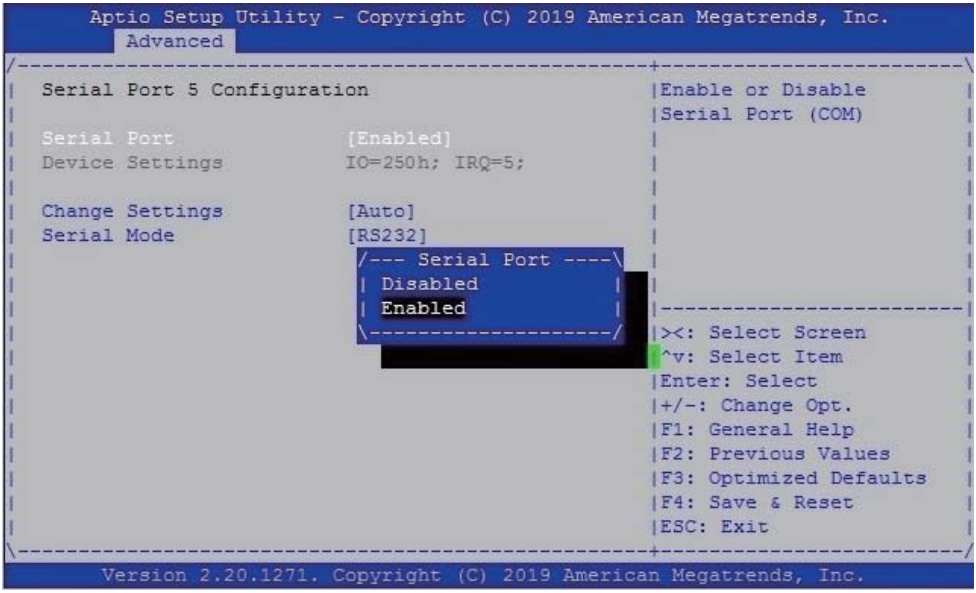



Change Settings, default is Auto.

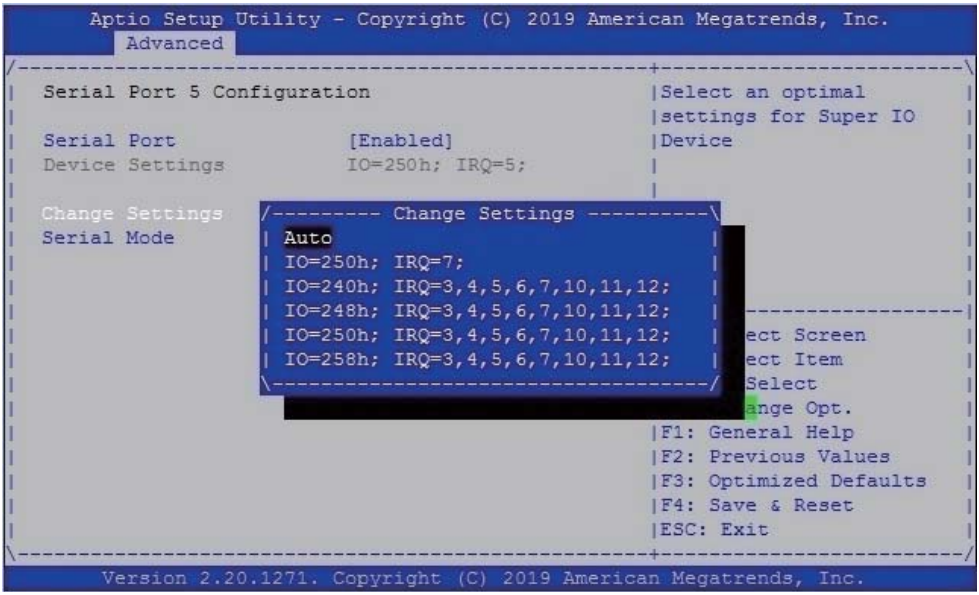



To select the Serial port to RS232 / RS422 / RS485, default is RS232

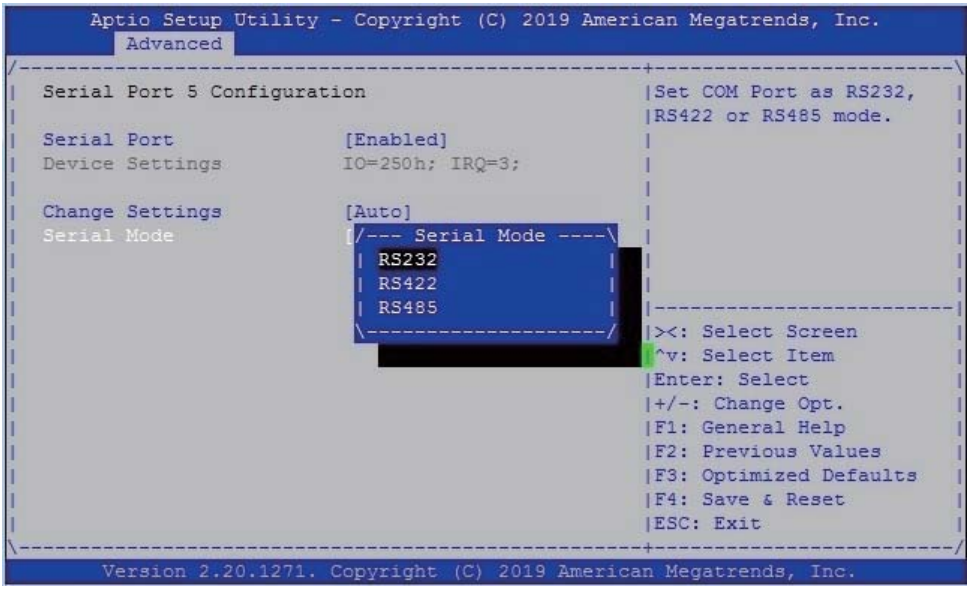
## 4-6-5-3 ► Serial Port 5 Configuration




To Enable Serial port or not, default is Enabled.

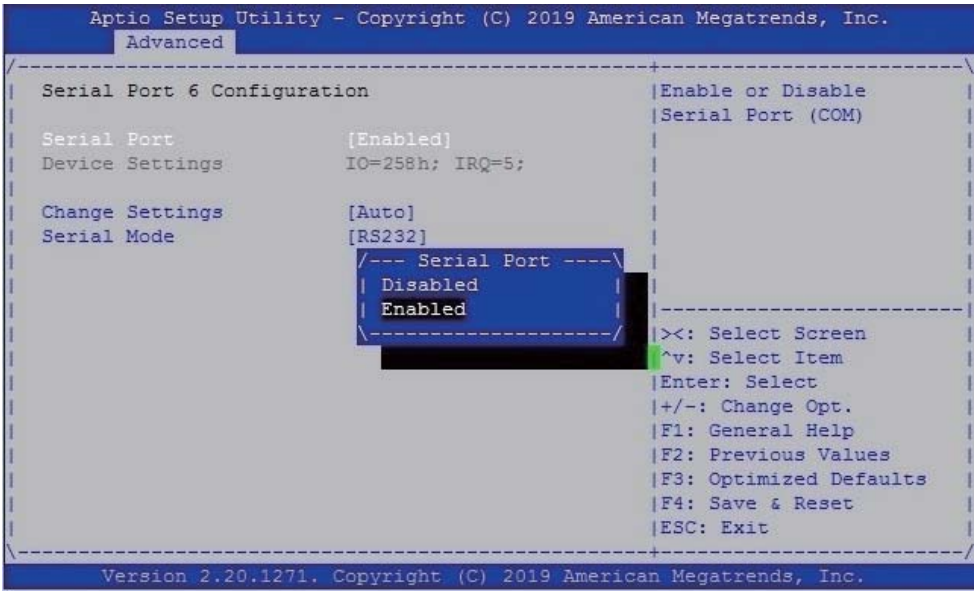



Change Settings, default is Auto.

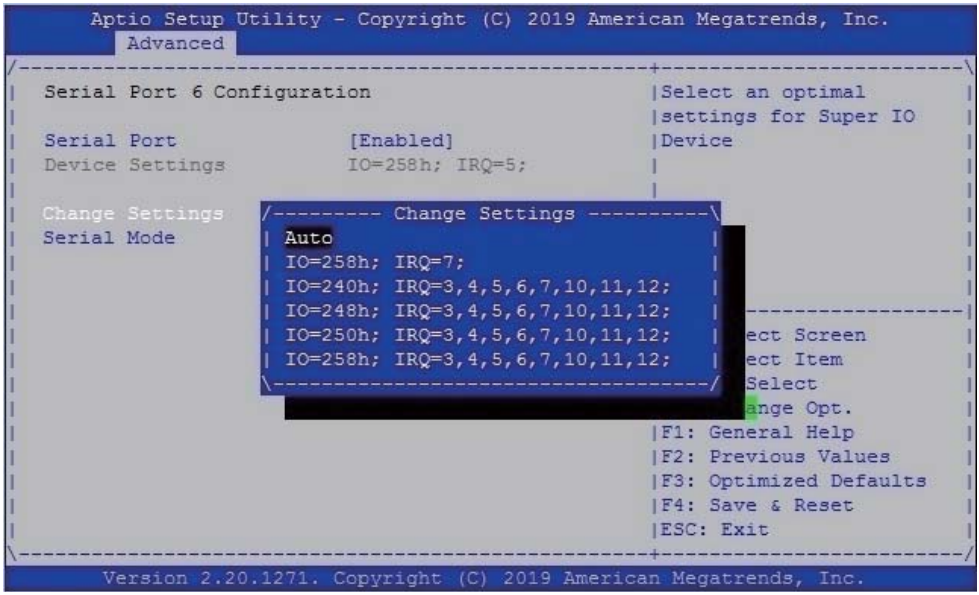



To select the Serial port to RS232 / RS422 / RS485, default is RS232

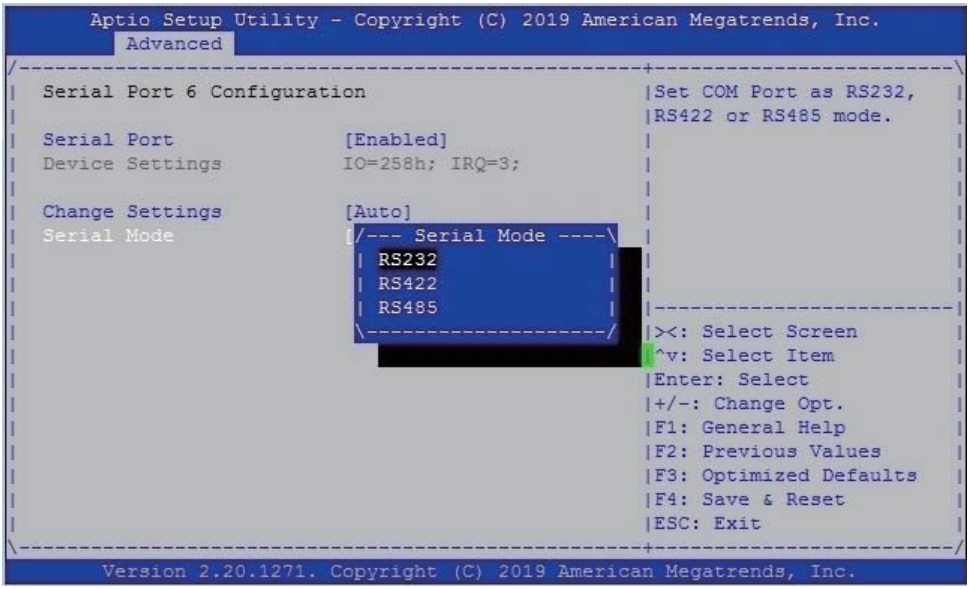
## 4-6-5-4 ► Serial Port 6 Configuration




To Enable Serial port or not, default is Enabled.

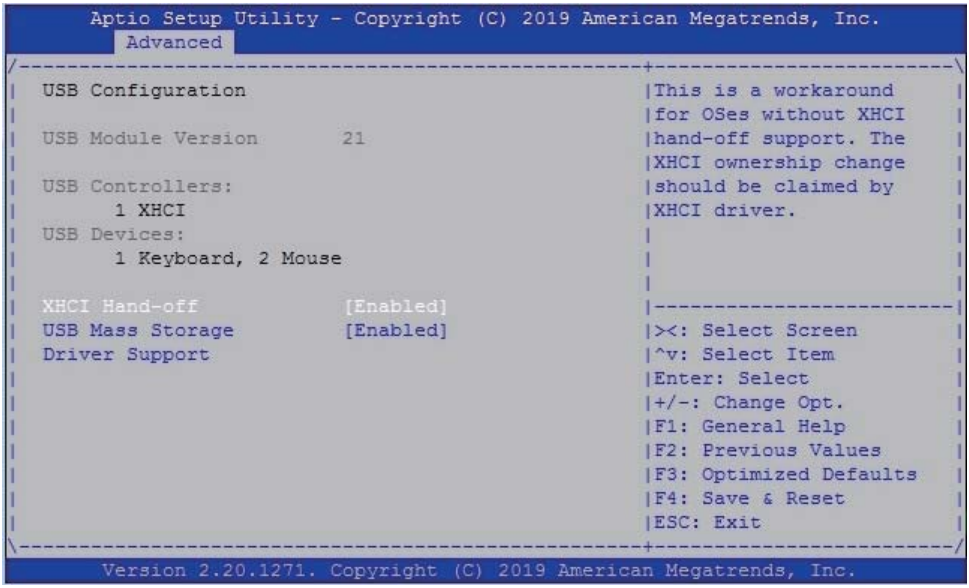



Change Settings, default is Auto.




To select the Serial port to RS232 / RS422 / RS485, default is RS232

## 4-6-6 USB Configuration



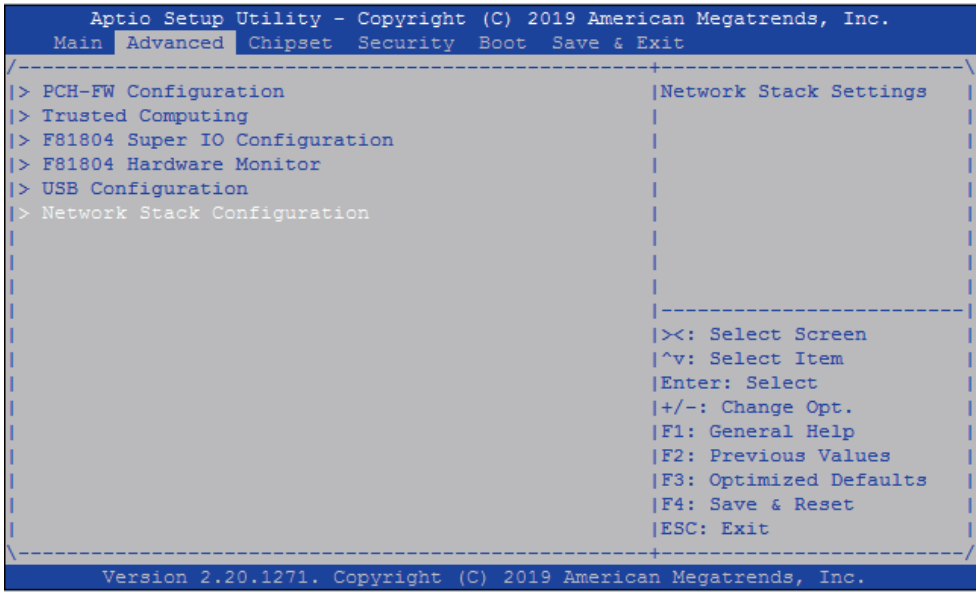

**XHCI Hand-off**

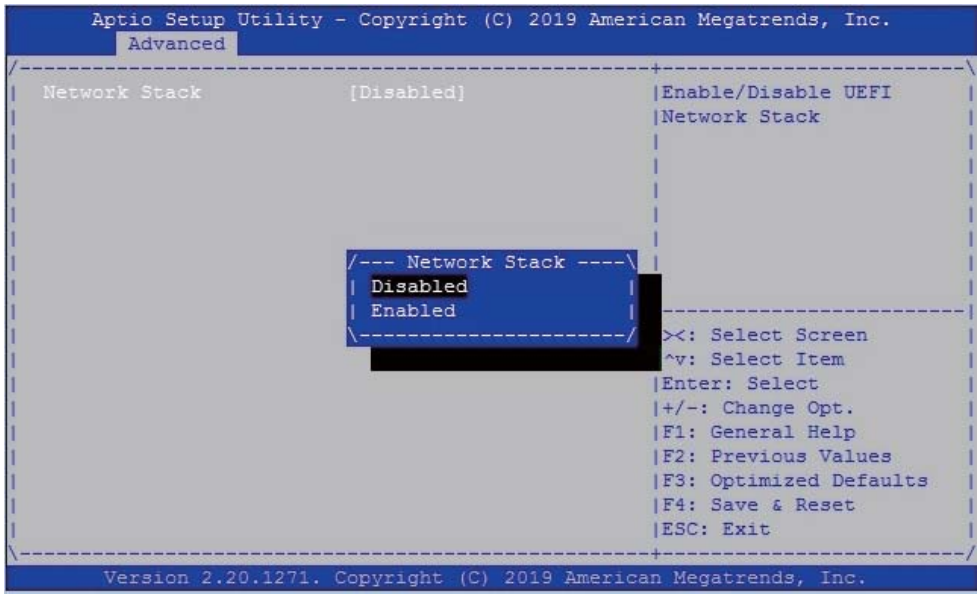
To enable XHCI hand-off support or not, default is Enabled.

**USB Mass Storage Driver Support**

To enable USB mass storage support or not, default is Enabled.

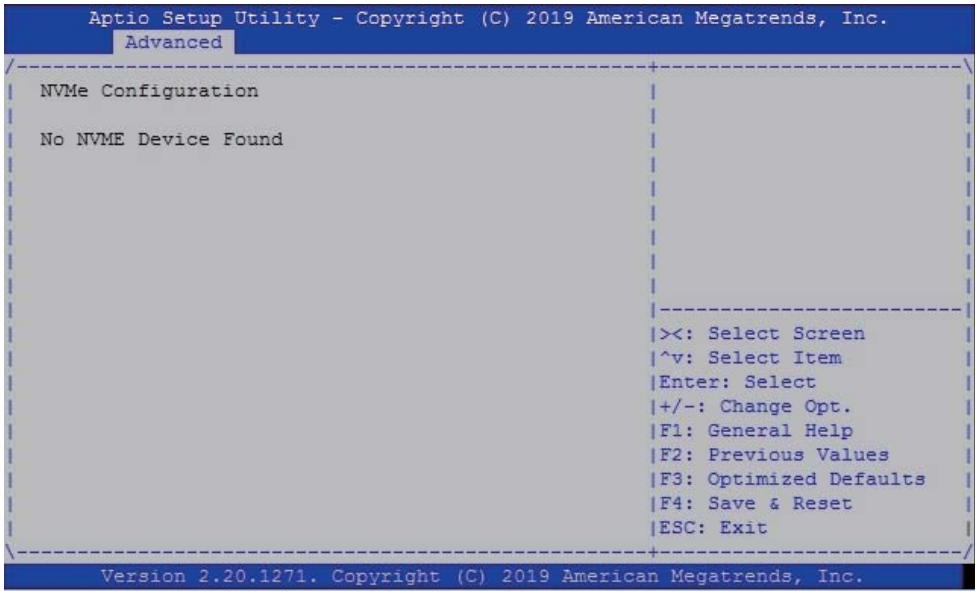
## 4-6-7 Network Stack Configuration



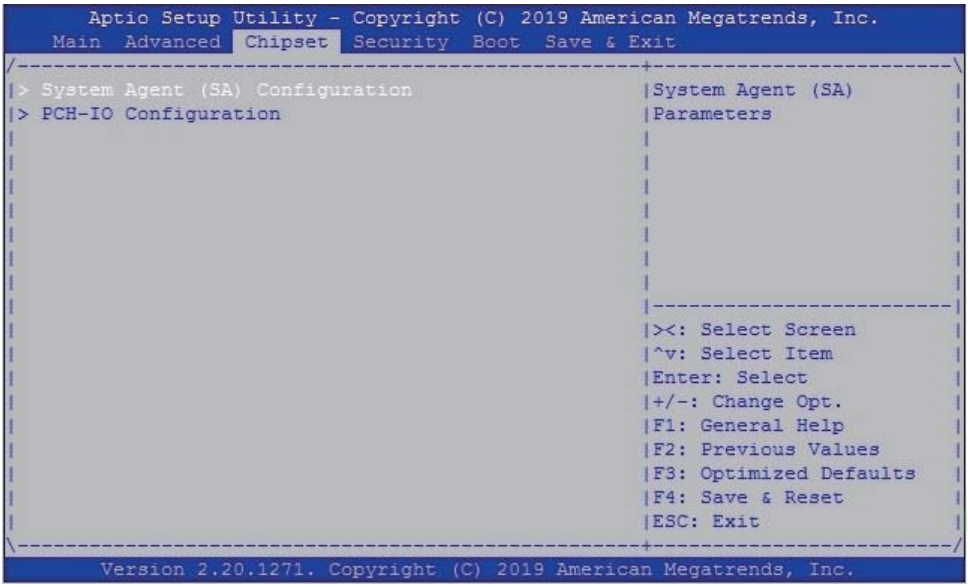

To enable the Network stack or not, default is Disabled.

## 4-6-8 NVMe Configuration




To detect NVMe storage automatically.

## 4-7 Chipset



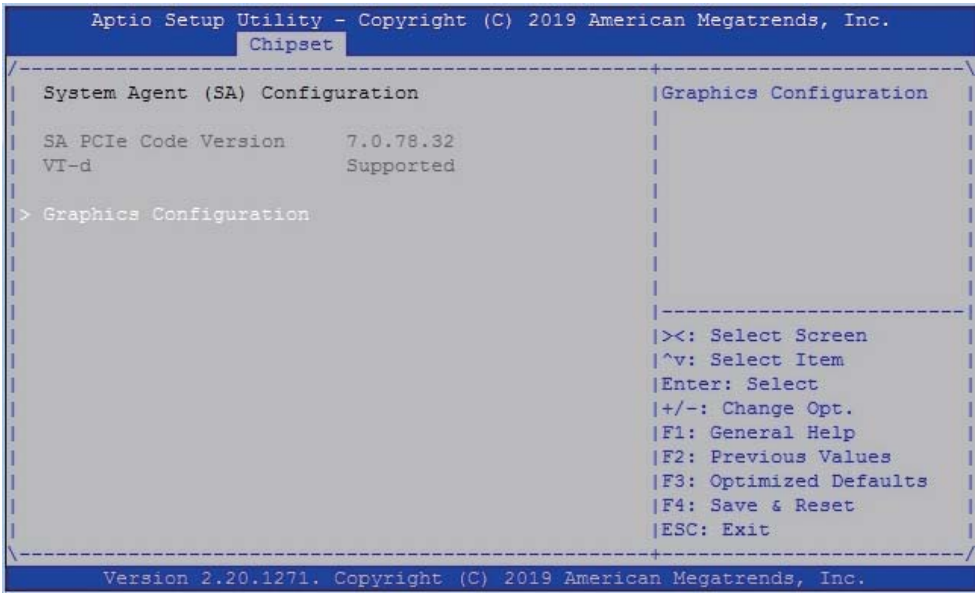

**System Agent (SA) Configuration.**

Please refer section 4-7-1

**PCH-IO Configuration.**

Please refer section 4-7-2

## 4-7-1 System Agent (SA) Configuration




**Graphics Configuration.**

Please refer section 4-7-1-1

## 4-7-1-1 ► Graphics Configuration




**GTT Size**

Graphics Translation Table Size. The optional settings are: 2MB, 4MB, 8MB (default)

**Aperture Size**

The optional settings are: 128MB, 256MB (default), 512MB, 1024MB, 2048MB

**DVMT Pre-Allocated**

Use this item to select DVMT 5.0 pre-allocated (fixed) graphics memory size used by the internal graphics device.

The optional settings are: 16MB, 32MB, 64MB (default)

**DVMT Total Gfx Mem**

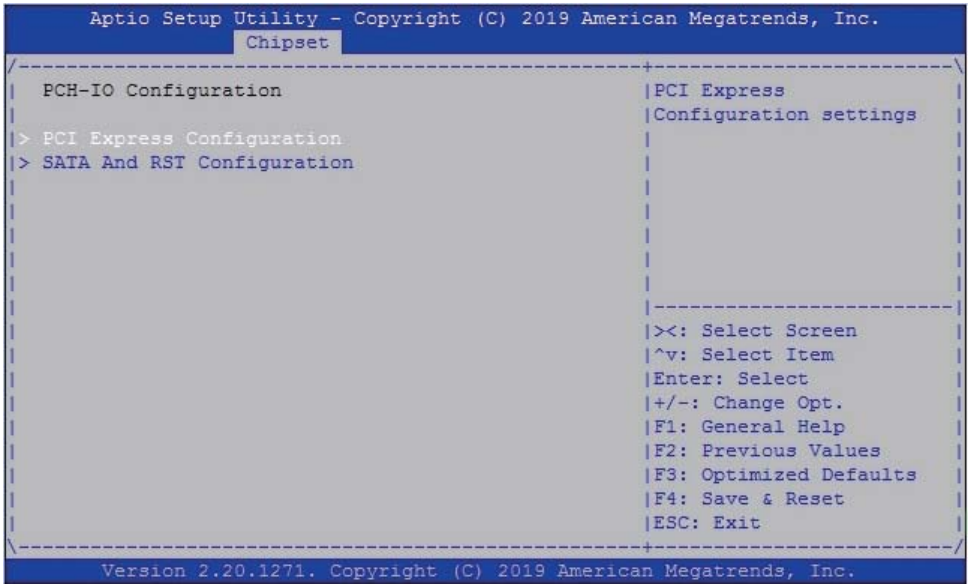
Use this item to select DVMT 5.0 total graphics memory size used by the internal graphics device

The optional settings are: 128MB, 256MB (default), MAX.

**LVDS Resolution**

To enable LVDS port or not.

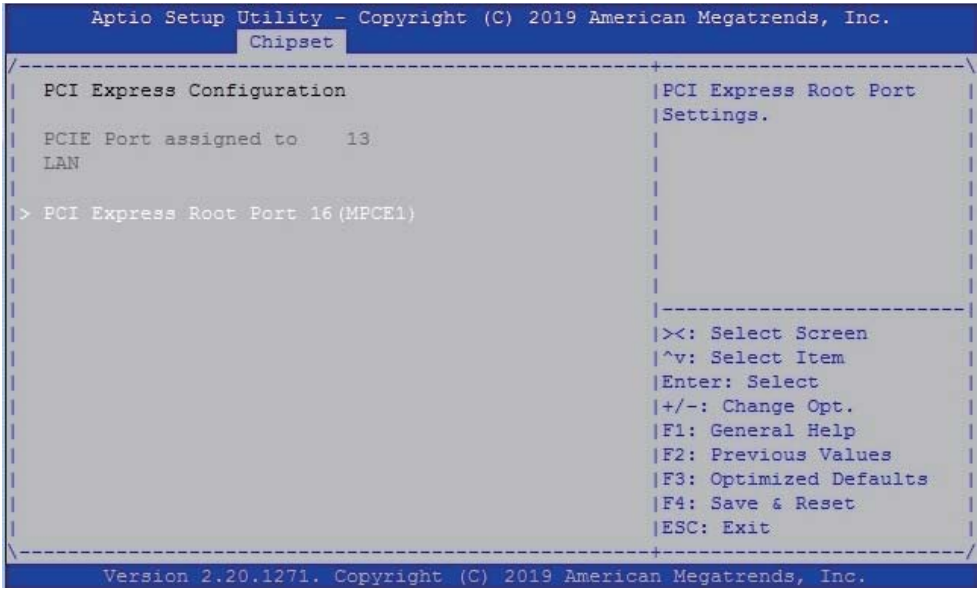
## 4-7-2 PCH-IO Configuration

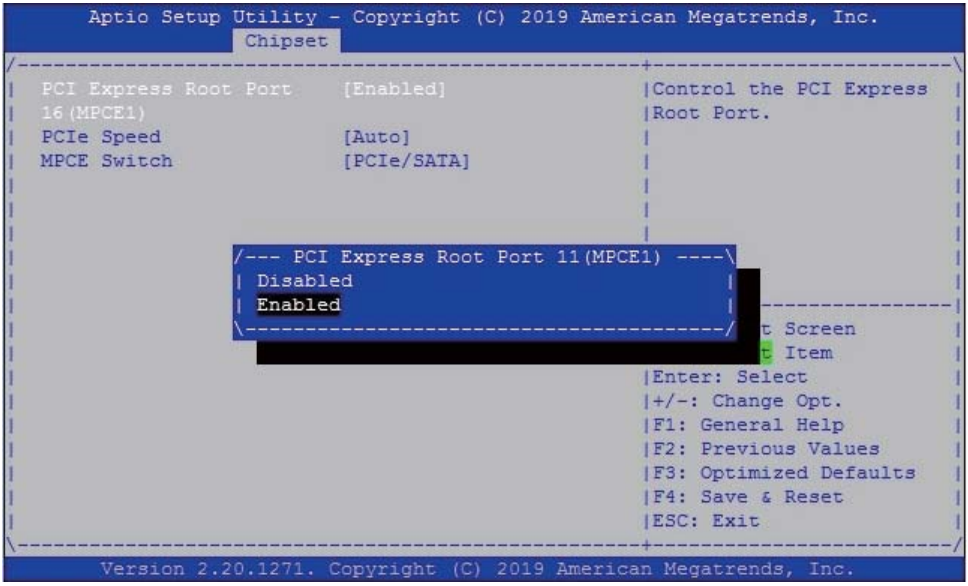



**PCI Express Configuration.**
Please refer section 4-7-2-1

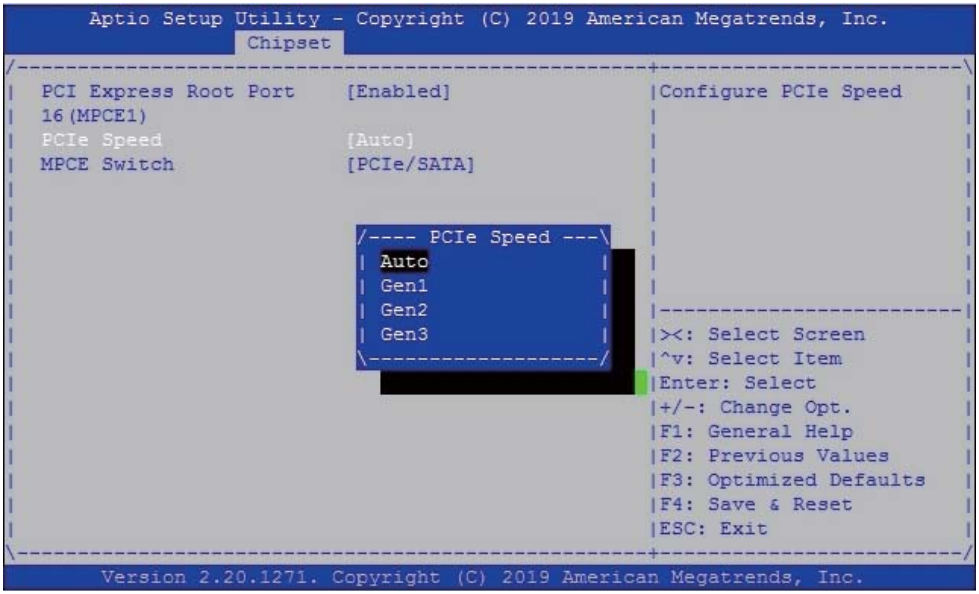
**SATA And RST Configuration.**
Please refer section 4-7-2-2

## 4-7-2-1 ► PCI Express Configuration

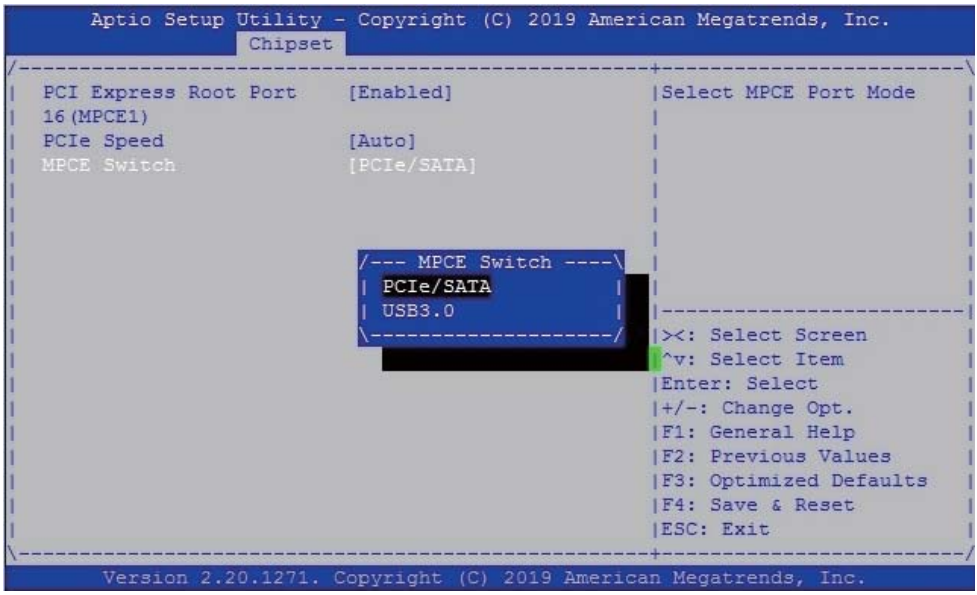



The optional settings are: Enabled (default), Disabled.

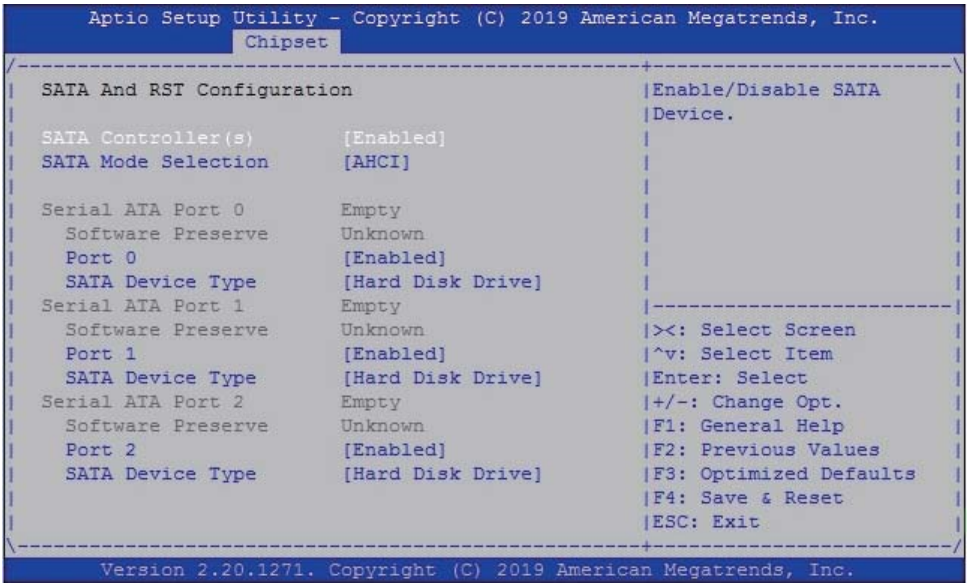



To select PCI Express port speed. The optional settings are: Auto (default), Gen1, Gen2, Gen3




To select the MPCE1 support PCIe / SATA or USB3.0 device

## 4-7-2-2 ► SATA And RST Configuration



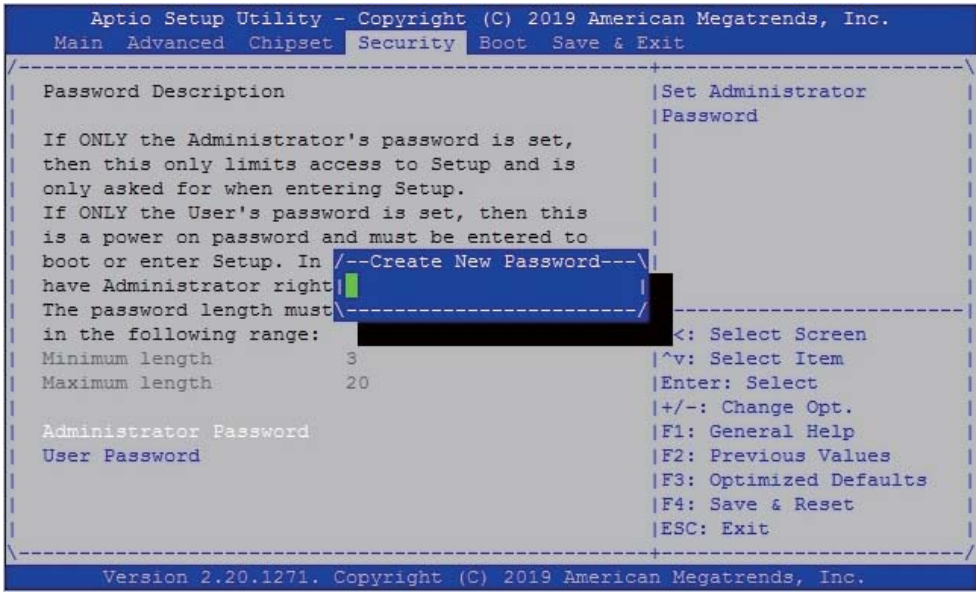

**SATA Controller**

Use this item to Enable or Disable SATA Device.

**SATA Mode Selection**

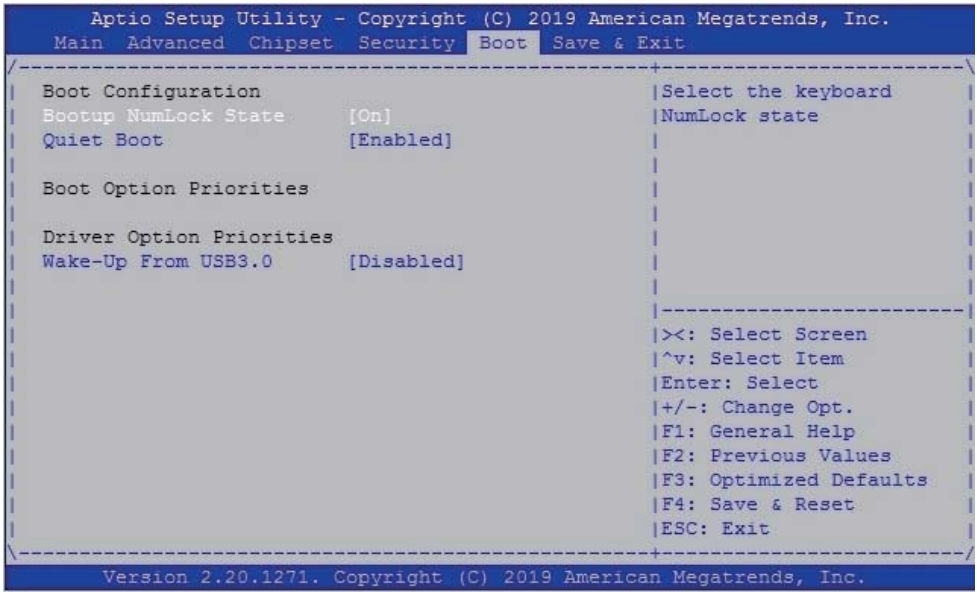
Support AHCI Mode only.

## 4-8 Security




**Administrator Password**
User Password
To set up an Administrator or an User password

## 4-9 Boot

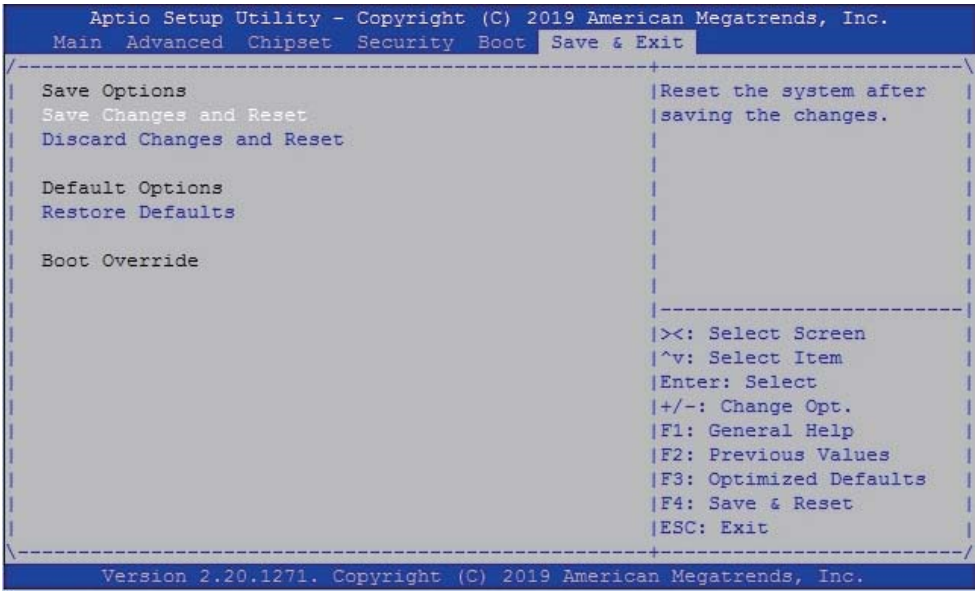



**Bootup NumLock State**
To select Power-on state for NumLock, default is <On>

**Quiet Boot**
The optional settings are: Enabled (default), Disabled.

**Wake-Up From USB 3.0**
The optional settings are: Enabled, Disabled (default).

## 4-10 Save & Exit




**Save Change and Reset**

Save configuration and reset

**Discard Changes and Reset**

Reset without saving the changes

**Restore Defaults**

To restore the optimal default for all the setup options

## 4-11 How to update AMI BIOS

STEP 1. Prepare a bootable disc.
(Storage device could be USB pen drive.)
STEP 2. Copy utility program and latest BIOS to your bootable disc.
You may download it from our website.
STEP 3. Here take 3I810HW as an example, insert your bootable disc into X: (X could be C:, A: or others.
It depends on which type of storage device you use. )

Start the computer and type
For legacy mode,
X:\>afudos.exe 3I810HWA1.bin /p /b /n /x
For UEFI mode,
X:\>AfuEfix64.efi 3I810HWA1.bin /p /b /n /x

## Appendix B: Resolution list

| |
|---|
| 640 x 480 x ( 256 / 16bit / 32bit ) |
| 800 x 600 x ( 256 / 16bit / 32bit ) |
| 1024 x 768 x ( 256 / 16bit / 32bit ) |
| 1152 x 864 x ( 256 / 16bit / 32bit ) |
| 1280 x 600 x ( 256 / 16bit / 32bit ) |
| 1280 x 720 x ( 256 / 16bit / 32bit ) |
| 1280 x 768 x ( 256 / 16bit / 32bit ) |
| 1280 x 800 x ( 256 / 16bit / 32bit ) |
| 1280 x 960 x ( 256 / 16bit / 32bit ) |
| 1280 x 1024 x ( 256 / 16bit / 32bit ) |
| 1400 x 1050 x ( 256 / 16bit / 32bit ) |
| 1440 x 900 x ( 256 / 16bit / 32bit ) |
| 1600 x 900 x ( 256 / 16bit / 32bit ) |
| 1600 x 1200 x ( 256 / 16bit / 32bit ) |
| 1680 x 1050 x ( 256 / 16bit / 32bit ) |
| 1920 x 1080 x ( 256 / 16bit / 32bit ) |
| 1920 x 1200 x ( 256 / 16bit / 32bit ) |