

# 2I640HW

**Intel Elkhart Lake ATOM® x6413E / J6412 SoC CPU,  
On Board LPDDR4, 2 x LAN /  
eDP / LVDS / HDMI / USB / COM / M.2 / PCIe mini card**

## **All-In-One**

**Intel Elkhart Lake ATOM® x6413E / J6412 SoC CPU  
HDMI, eDP, LVDS, 1 x M.2, 1 x Mini PCIe, 2 x LAN, 1 x Nano SIM,  
USB, COM, Wide Range DC-IN 9~36V**

## **CAUTION**

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

**NO. 2I640HW**

**Release date: OCT. 20. 2022**

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## 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 from 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.

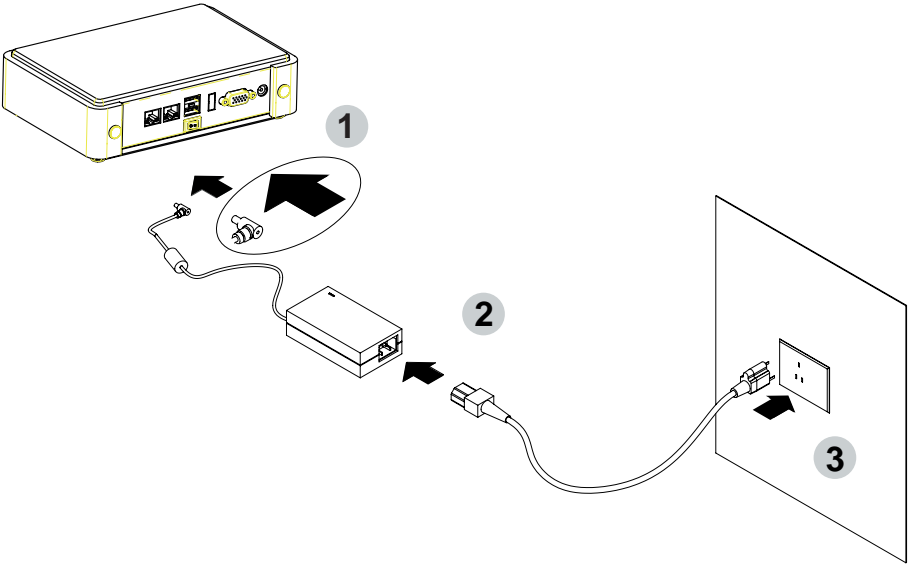
### **Remark 1:**

**Always insert / unplug the DC-in horizontally & directly to / from the motherboard. DO NOT twist, it is designed to fit snugly.**

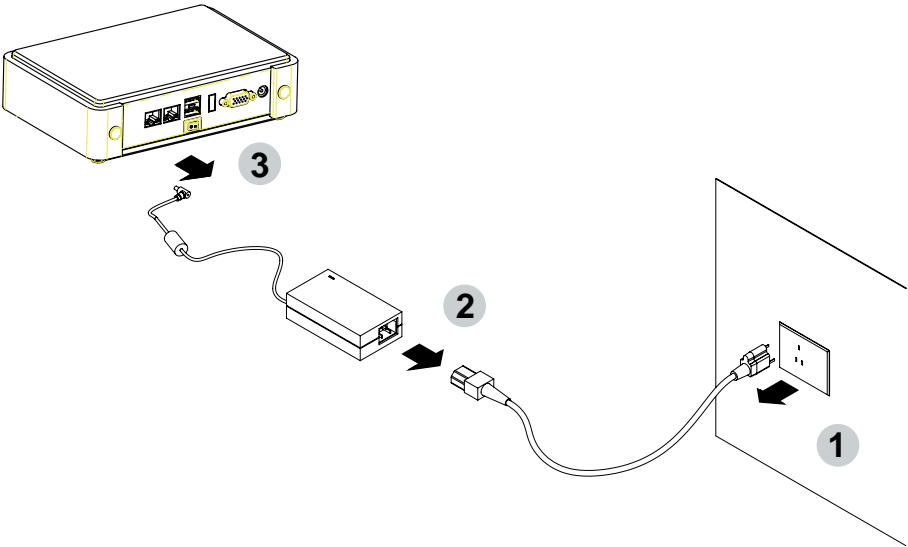
**Moreover, erratic pull / push action might cause an unpredictable damage to the component & system unit.**

**Photo 1**

**Insert**



**Unplug**



---

# Chapter-1

## General Information

The 2I640HW is a 2.5" (102 x 88 mm) motherboard powered with Intel Atom® x6000E series and Celeron® J (formerly Elkhart Lake) processor & offered the ideal platform for high performance applications. The ultra compact (102 x 88 mm) motherboard with wide range 9~36V DC power input & embeds multiple Intel 2.5GbE LAN, USBs, COM Ports and HDMI, LVDS, eDP display interface that offer the ideal platforms for high performance applications in Networking, Smart Automation, Machine Vision, In-vehicle, Industry 4.0 and any compact high-performance Internet of Things (IoT) applications

The 2I640HW supports high-speed data transfer interfaces such as PCIe gen3, USB 3.0, and SATA 6 Gb/s (SATA III) for SATA port and M.2 B-Key device, with LPDDR4 3200 MHz on board 8G memory and supports 4 serial ports, 1 port RS232 / RS485 / RS422 jumper free auto switch by BIOS. 3 port RS232 only. It supports 1 port of USB 3.0, 5 port of USB 2.0. The expandable interfaces include 1 mini card for PCIe and USB interface, and 1 M.2 B-Key for SATA and USB 3.0 / 2.0 interface.

The embedded motherboard 2I640HW is specially designed with Wide-Range Voltage DC in (9~36V) for widely varying input voltage requirement. All wafer IO design offers superb performance and PC specification in the industry using the specific housing. It supports with two 10 / 100 / 1000 / 2500 Mbps Ethernet for seamless broadband connectivity. With Wake-On LAN function and the PXE function in BIOS, these are perfect control boards for networking devices.



## 1-1 Major Feature

1. Intel® Atom x6413E Processor 1.5GHz / 2.7GHz (Quad Core),  
Intel® Celeron Processor J6412 2.0GHz / 2.6GHz (Quad Core)
2. Intel® UHD Graphics for 10th Gen Intel® Atom x6413E 500MHz / 750MHz,  
Intel® Celeron J6412 400MHz / 800MHz
3. Support HDMI 1.2 up to 1920 x 1080 at 60Hz, 24bits / 2 Channel LVDS up to  
1920 x 1080 resolution and eDP 1.3 2 Lanes up to 1920 x 1080 at 60Hz.
4. Support USB Touch & backlight power control function
5. Onboard LPDDR4 4G / 8G
6. Support 2 x 2.5G Intel LAN port.
7. Support total 4 port RS232, 1 x RS232 selectable to RS485 / RS422 by BIOS  
and 3 x RS232 only
8. 1 x USB 3.0 and 5 x USB 2.0
9. ALC888S HD Audio Specification 1.0 Two channel sound chipset with 2.1W audio AMP.
10. Support extended 1 x mini card PCIe / USB2.0 and 1 x M.2 B-Key for mSATA and  
USB 3.0 / 2.0 interface with Nano SIM.
11. Hardware digital Input & Output, 4 x DI / 4 x DO, Hardware Watch Dog Timer,  
0~255 sec programmable
12. Wide Range DC IN +9V~36V

## 1-2 Specification

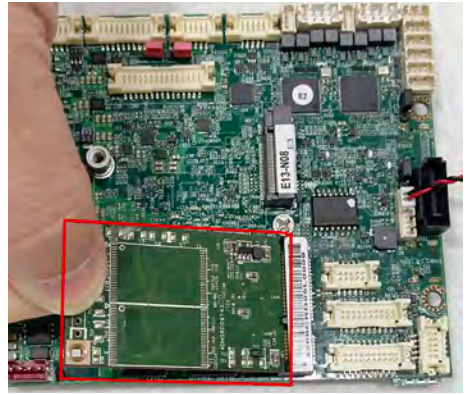
1. **SOC:** Intel® Atom x6413E Processor 1.5GHz / 2.7GHz (Quad Core),  
Intel® Celeron Processor J6412 2.0GHz / 2.6GHz (Quad Core)
2. **Memory:** Onboard LPDDR4 4G / 8G
3. **Graphics:** Intel® UHD Graphics for 10th Gen Intel® Atom x6413E 500MHz / 750MHz,  
Intel® Celeron J6412 400MHz / 800MHz, Support HDMI 1.2 up to 1920 x 1080 at 60Hz,  
24bits / 2 Channel LVDS up to 1920 x 1080 resolution and eDP 1.3 2 Lanes up  
to 1920 x 1080 at 60Hz.
4. **LAN:** 2 Intel I225-V LAN chipset with 2.5G chipset for PCIe Gen2 x 1 V3.1 interface.
5. **I/O Chip:** Switch chipset for 1 ports RS232 / RS422 / RS485 selected by BIOS,  
3 port RS232 only.
6. **Sound:** Support line in, line out and MIC in, Two channel Class D Audio Amplifier
7. **USB:** 1 type C USB 3.0 (Lex design), 5 USB 2.0
8. **WDT / DIO:** Hardware digital Input & Output, 4 x DI / 4 x DO (Option) /  
Hardware Watch Dog Timer, 0~255 sec programmable
9. **Expansion interface:** one mini card PCIe and USB interface,  
one M.2 B-key for mSATA and USB 3.0 / 2.0 interface with Nano SIM
10. **BIOS:** Insyde UEFI BIOS
11. **Dimension:** 102 x 88 mm
12. **Power:** On board DC +9~36V

## 1-3 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

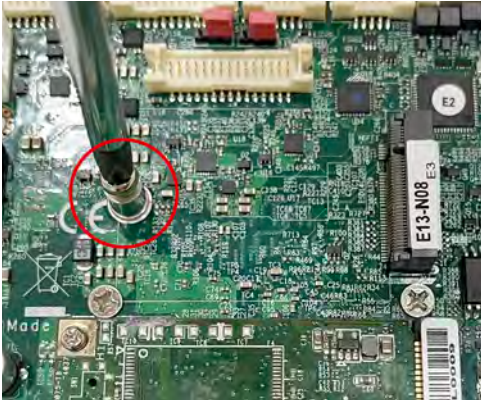


3. Gently push down the Mini Card and screw the screw back.



## 1-4 Directions for installing the M.2 B Key Mini Card

1. Unscrew the screw on the board



2. Plug in the Mini Card in a 45 angle

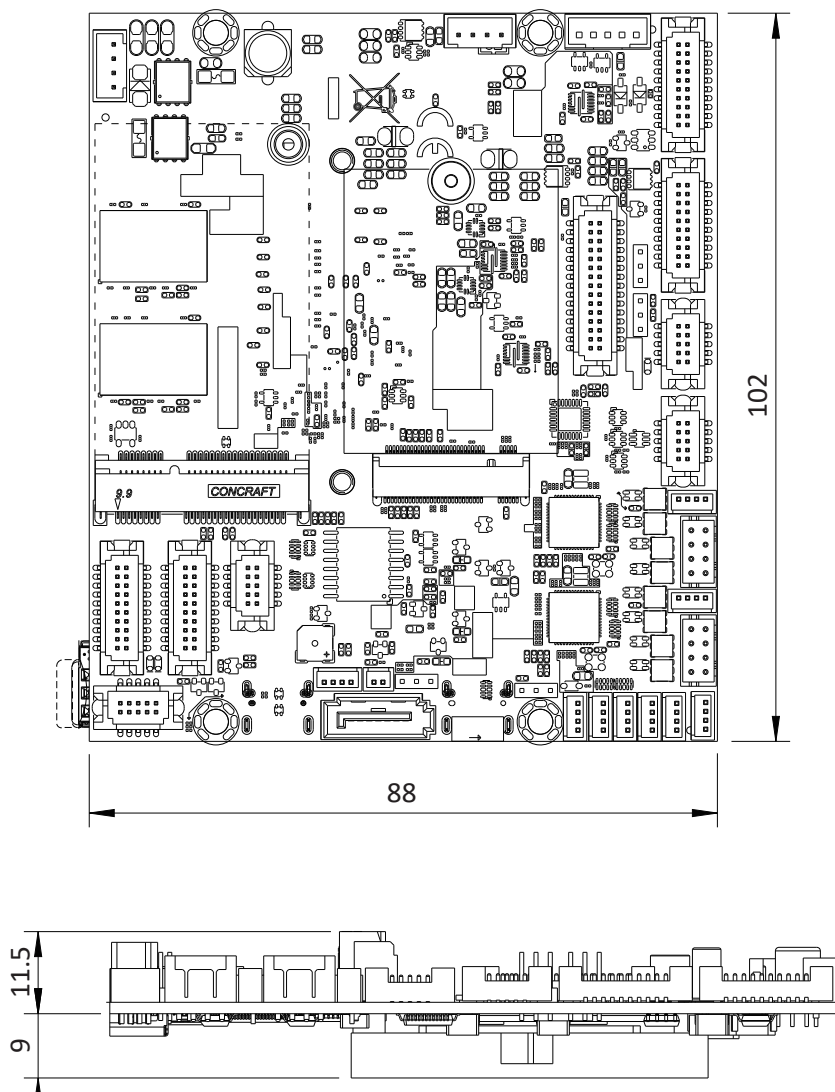


3. Gently push down the Mini Card and screw the screw back.



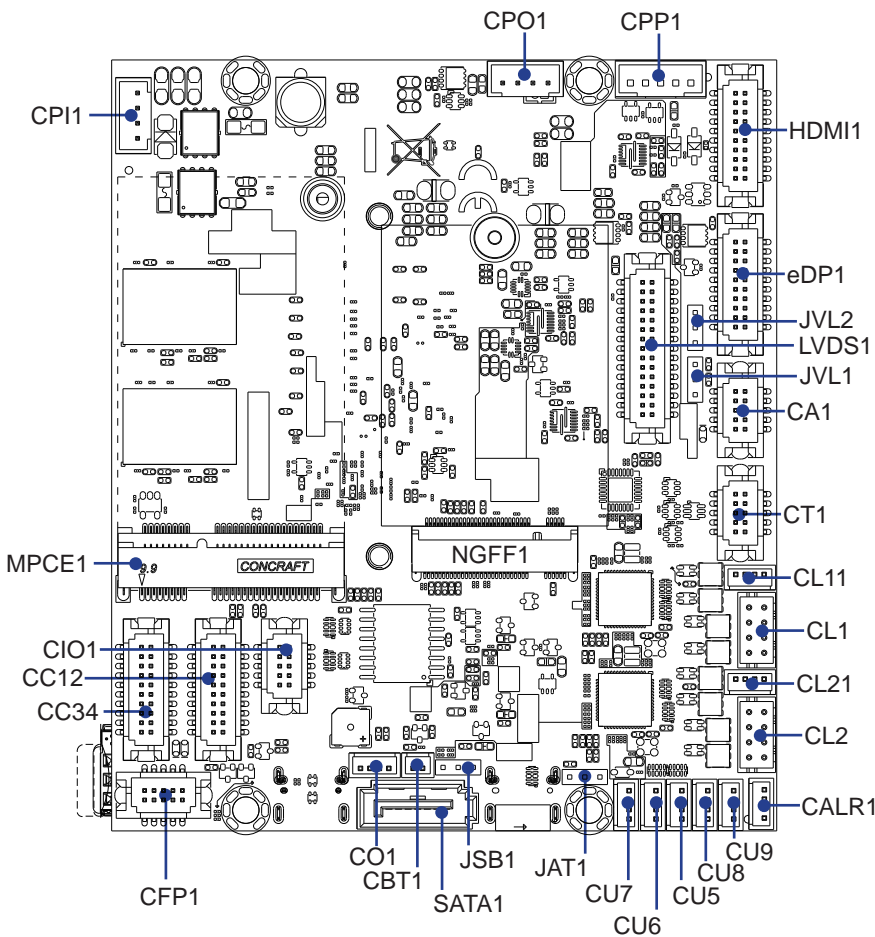
## Chapter-2

### 2-1 Dimension-2I640HW



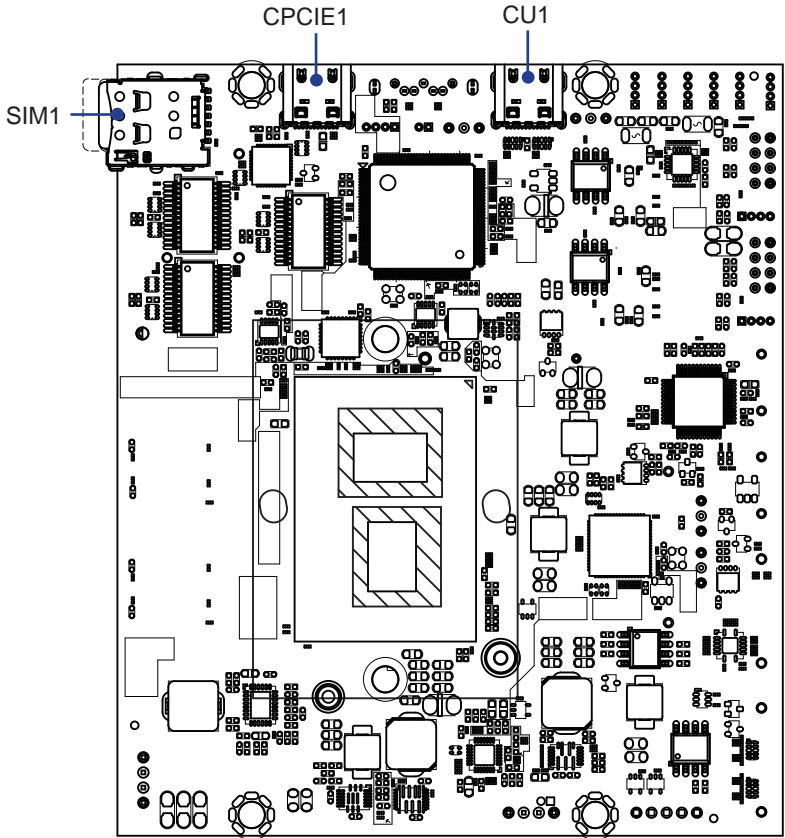
# 2-2 Layout-2I640HW-Connector and Jumper

TOP



## 2-2-1 Layout-2I640HW-Connector and Jumper Bottom

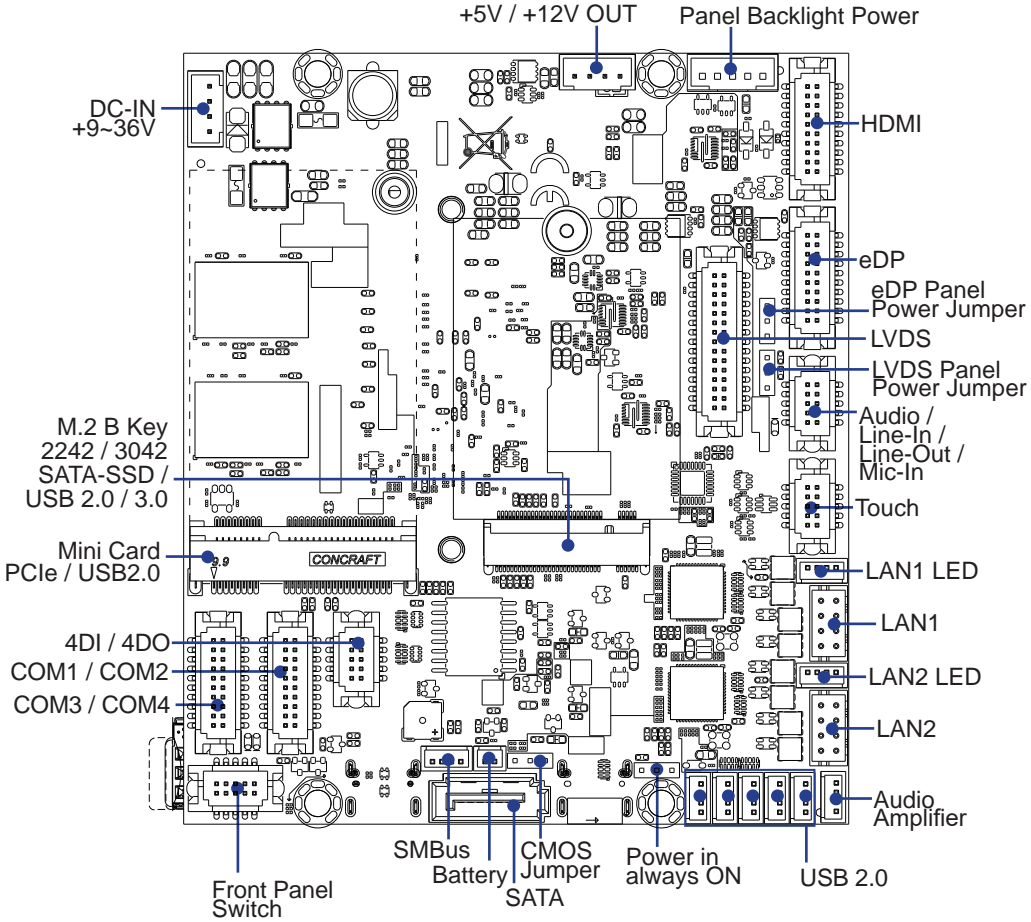
BOT





## 2-3 Layout-2I640HW-Function MAP

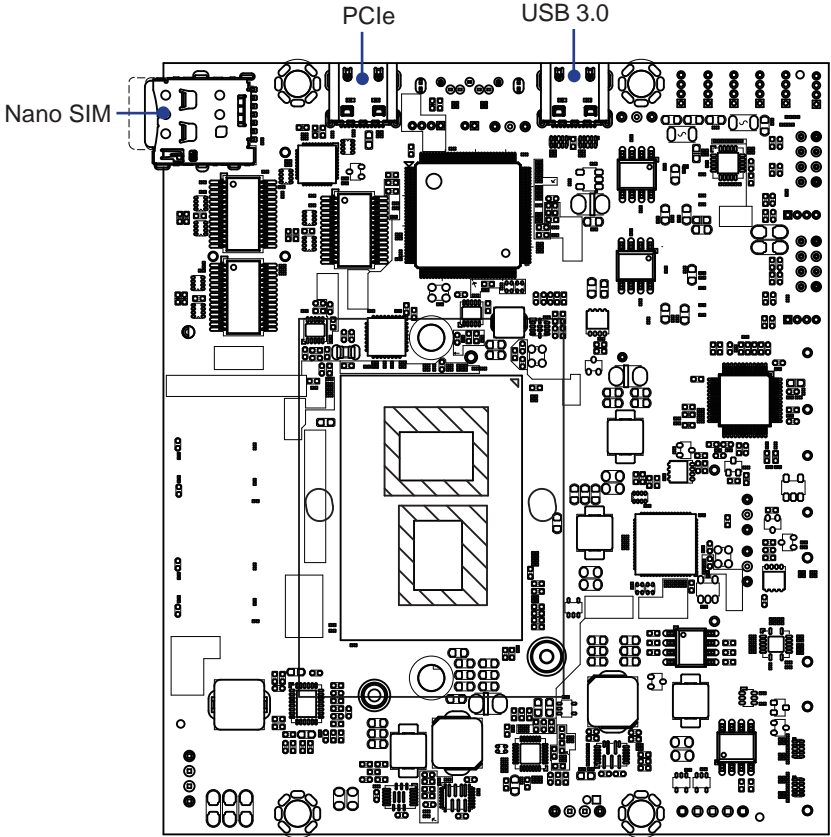
TOP





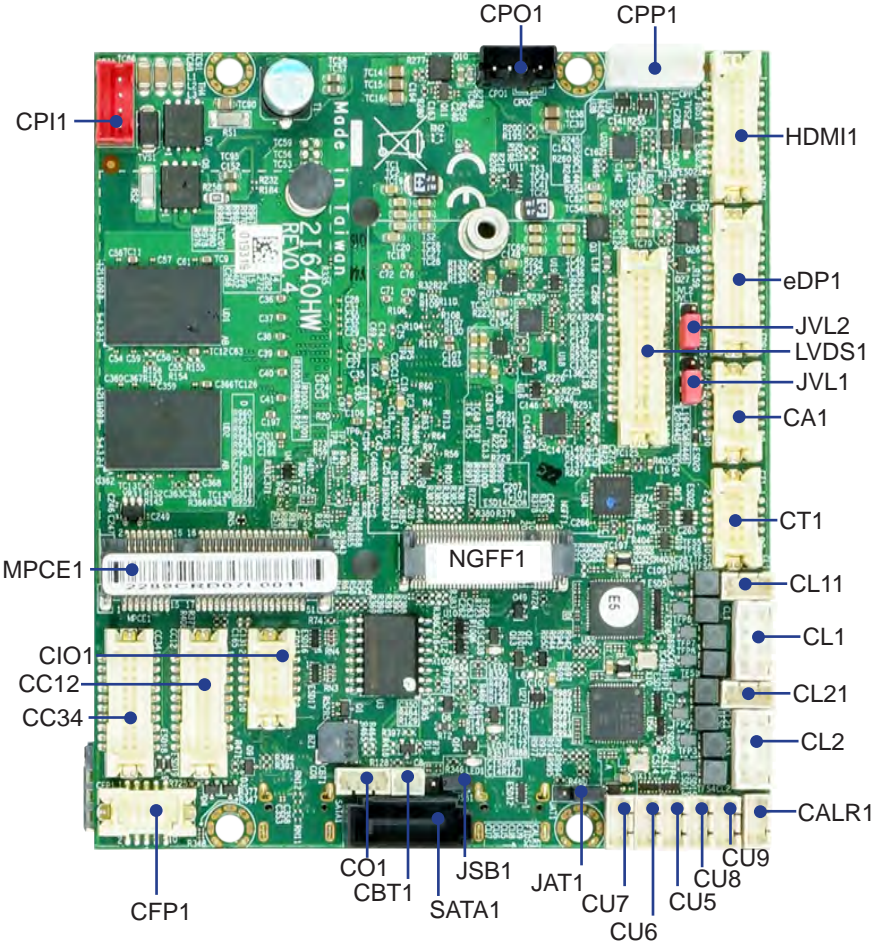
2-3-1 Layout-2I640HW-Function MAP

BOT



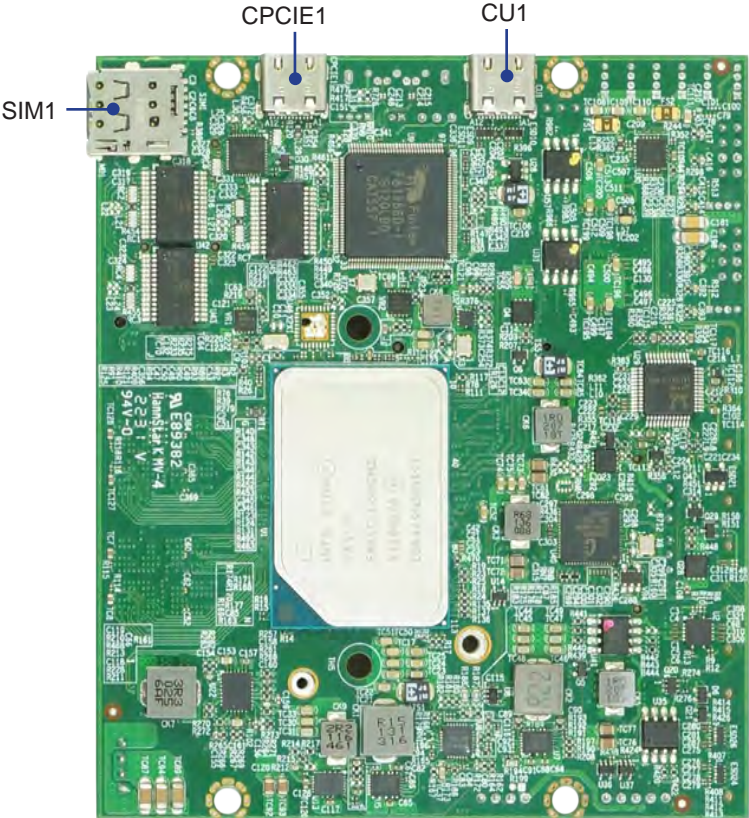
## 2-4 Diagram- 2I640HW

TOP



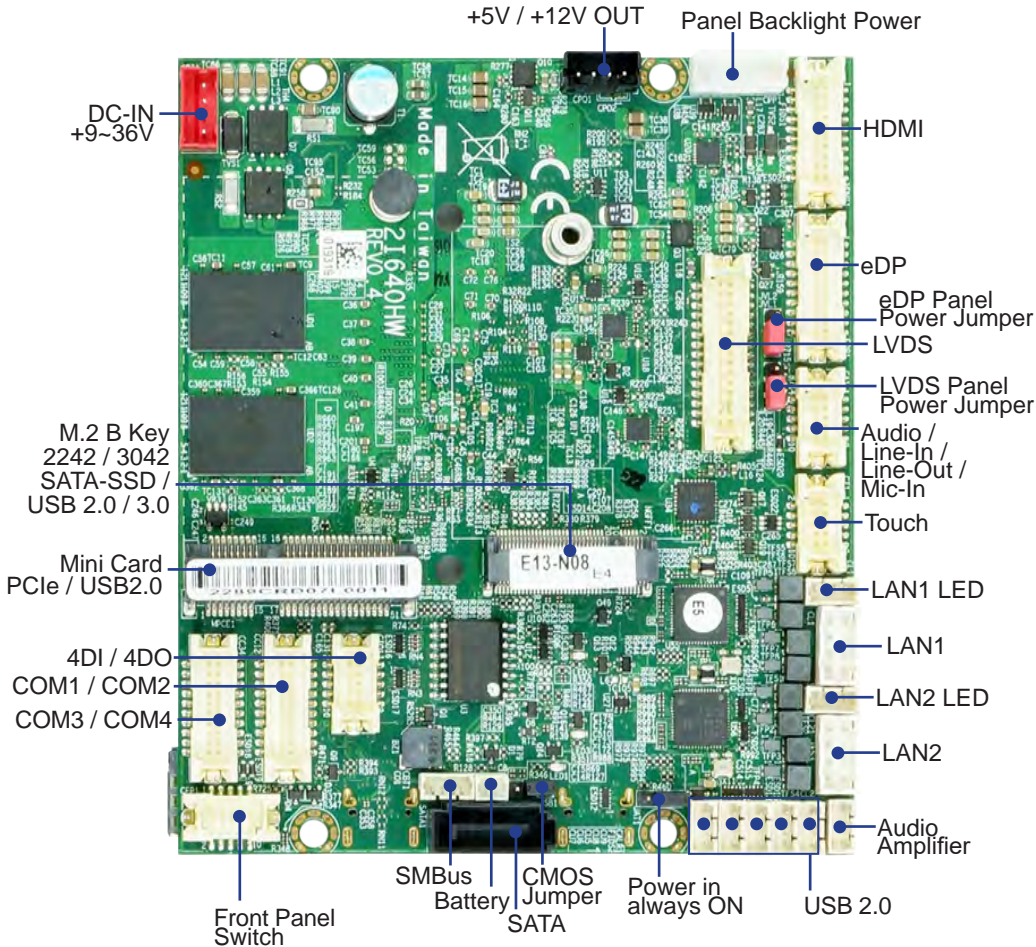
2-4-1 Diagram- 2I640HW

BOT



# 2-5 Function MAP- 2I640HW

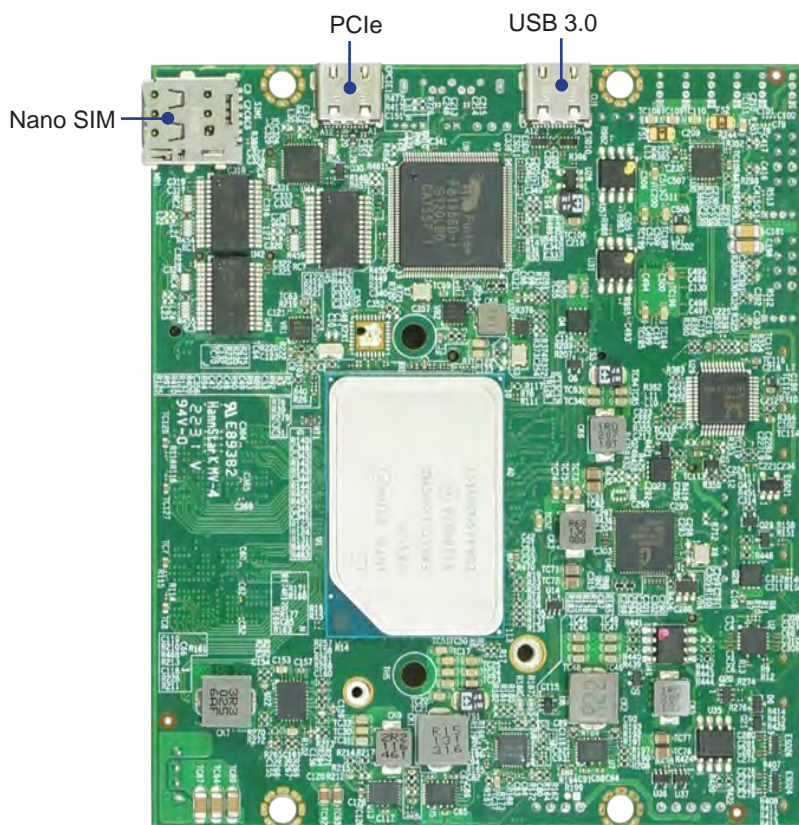
TOP





## 2-5-1 Function MAP- 2I640HW

BOT



## 2-6 List of Jumpers

JSB1: CMOS DATA Clear

JAT1: Power in always ON function

JVL1: LVDS panel power select

JVL2: eDP panel power select

## 2-7 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.

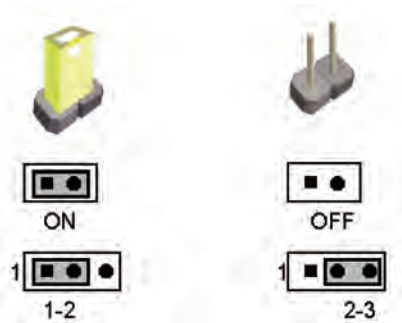


Figure 2.2

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 .

## 2-8 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.

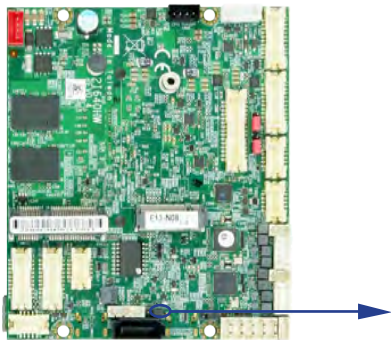
To clear the CMOS, follow the procedures below:

- 1. Turn off the system and unplug the AC power
- 2. Remove DC IN power cable from DC IN power connector
- 3. Locate JSB1 and close pin 1-2 for 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 data clear

Note: Do not clear CMOS unless

- 1. Troubleshooting**
- 2. Forget password**
- 3. You fail over-clocking system**



JSB1



3 2 1

\*Normal



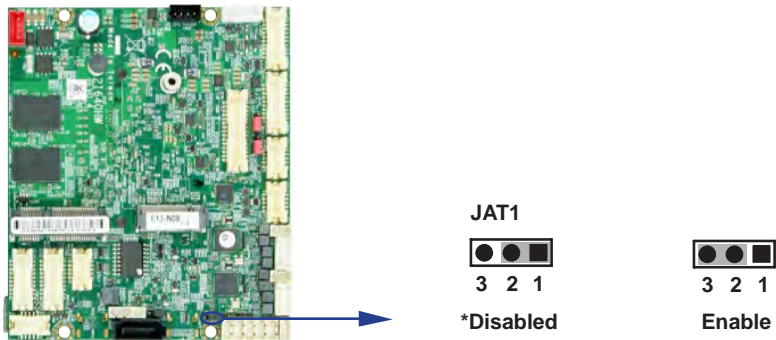
3 2 1

CMOS

## 2-9 JAT1: Power in always ON function

JAT1	DESCRIPTION
*1-2	Disabled
2-3	Enable

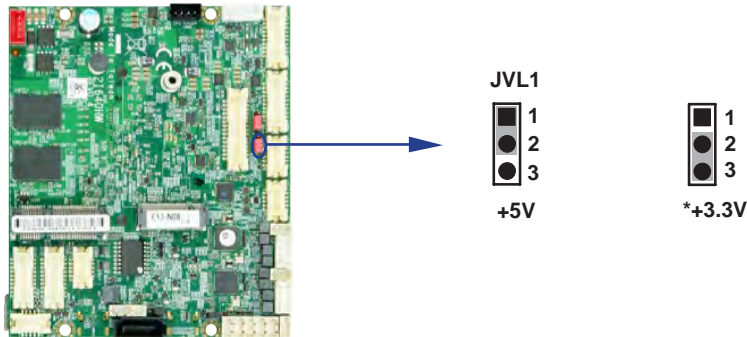
NOTE: Power always on function default is disabled.



## 2-10 JVL1: LVDS panel power select

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

Note: Attention! Check Device Power in spec

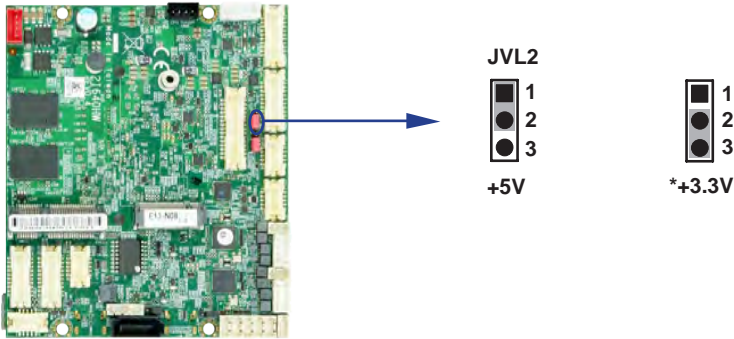




## 2-11 JVL2: eDP panel power select

JVL2	DESCRIPTION
1-2	+5V
*2-3	+3.3V

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

CBT1:	CMOS Battery in 1x2 pin (1.25mm) wafer
CU1:	USB 3.0 type C connector
CU5:	USB 2.0 port 1x4 pin (1.25mm) wafer
CU6:	USB 2.0 port 1x4 pin (1.25mm) wafer
CU7:	USB 2.0 port 1x4 pin (1.25mm) wafer
CU8:	USB 2.0 port 1x4 pin (1.25mm) wafer
CU9:	USB 2.0 port 1x4 pin (1.25mm) wafer
CL1:	LAN port 2x4 pin (2.0mm) wafer
CL2:	LAN port 2x4 pin (2.0mm) wafer
CL11:	LAN LED indication 1x4 pin (1.25mm) wafer
CL21:	LAN LED indication 1x4 pin (1.25mm) wafer
CC12:	COM1 / COM2 2x10 pin (1.25mm) wafer
CC34:	COM3 / COM4 2x10 pin (1.25mm) wafer
CFP1:	Front Panel connector 2x5 pin (1.25mm) wafer
CIO1:	4DI / 4DO 2x5 pin (1.25mm) wafer
CO1:	SMBus 1x4 pin (1.25mm) wafer
CPI1:	DC-IN 1x4 pin (2.0mm) Red wafer
CPO1:	+12V / +5V output 1x4 pin (2.0mm) Black wafer
EDP1:	eDP 2x10 pin (1.25mm) wafer
LVDS1:	LVDS 2CH 2x15 pin (1.25mm) wafer
HDMI1:	HDMI 2x10 pin (1.25mm) wafer
CPP1:	LVDS Panel Backlight power 1x5 pin (2.0mm) wafer
SIM1:	Nano SIM card socket
CT1:	Touch 2x5 pin (1.25mm) wafer
MPCE1:	Full size mini card sockets 52pin
NGFF1:	M.2 B key 2242 / 3042 H=8.5 sockets 75pin

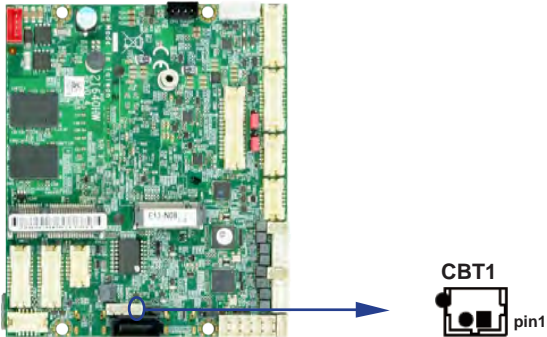
- CA1: Audio in and Mic out 2x5 pin (1.25mm) wafer
- CALR1: Audio Amplifier 1x4 pin (1.25mm) wafer
- SATA1: SATA connector 7 pin
- CIO1: 4DI / 4DO 2x5 pin (1.25mm) wafer
- CPCIE1: PCIe type C connector

### 3-2 CMOS battery connector

- CBT1: CMOS Battery in 1x2 pin (1.25mm) wafer

PIN NO.	DESCRIPTION
1	Battery in (GND)
2	Battery in (+3V)

NOTE: CBT1 for external connector can extend battery capacity.

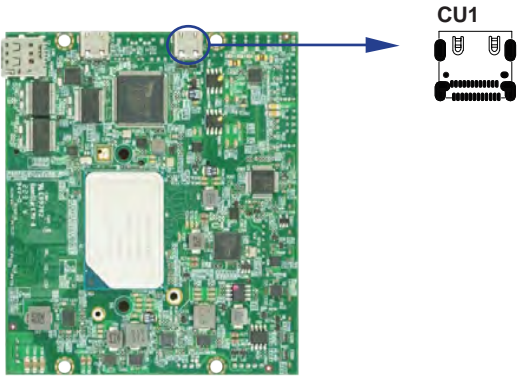


### 3-3 USB Interface

• CU1: USB 3.0 / 2.0 Type C connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
A1	GND	B12	GND
A2	USB3.0 A_TX+	B11	USB3.0 B_RX+
A3	USB3.0 A_TX-	B10	USB3.0 B_RX-
A4	+5V	B9	+5V
A5	NC	B8	NC
A6	USB2_A_DP	B7	USB2_B_DN
A7	USB2_A_DN	B6	USB2_B_DP
A8	NC	B5	NC
A9	+5V	B4	+5V
A10	USB3.0 A_RX-	B3	USB3.0 B_TX-
A11	USB3.0 A_RX+	B2	USB3.0 B_TX+
A12	GND	B1	GND

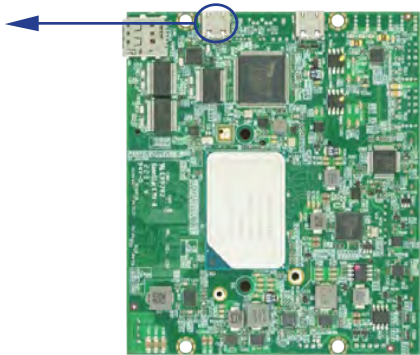
NOTE: Type C pin define for LEX.



### 3-4 CPCIE1: PCIe x2 Type C connector

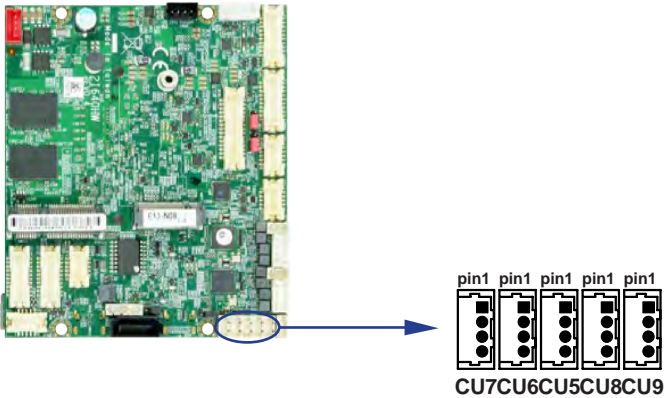
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
A1	GND	B12	GND
A2	PCIE0_TX_DP	B11	PCIE1_RX_DP
A3	PCIE0_TX_DN	B10	PCIE1_RX_DN
A4	+3.3V	B9	+3.3V
A5	PERST	B8	NC
A6	CLKOUT_P	B7	NC
A7	CLKOUT_N	B6	NC
A8	NC	B5	NC
A9	+3.3V	B4	+3.3V
A10	PCIE0_RX_DN	B3	PCIE1_TX_DN
A11	PCIE0_RX_DP	B2	PCIE1_TX_DP
A12	GND	B1	GND

NOTE: PCIe x2 Type C pin define for LEX.



**3-5 CU5.CU6.CU7.CU8.CU9: USB 2.0 1x4 pin (1.25mm) wafer**

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



### 3-6 LAN Interface

• **CL1 / CL2: LAN signal out 2x4 pin (2.0mm) wafer**

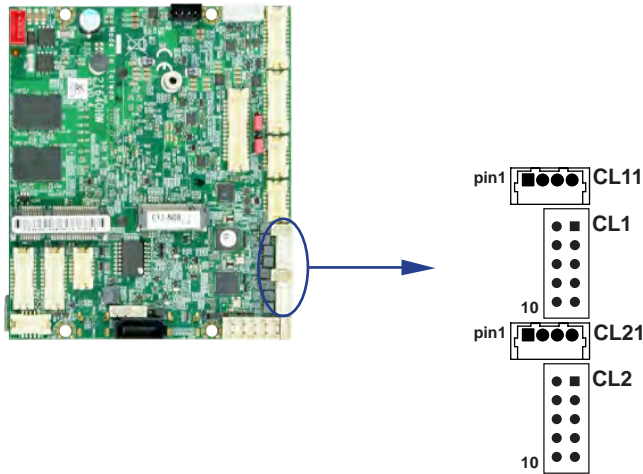
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TR0-	2	TR0+
3	TR2+	4	TR1+
5	TR1-	6	TR2-
7	TR3-	8	TR3+

Note: Can use CL001 connector Board to RJ45.

• **CL11 / CL21: LAN LED indicator 1x4 pin (1.25mm) wafer**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	Speed 100M
3	Speed 1G	4	Speed 2.5G

Note: Can use CL001 connector Board to RJ45.



## 3-7 COM interface

### CC12: COM1 / COM2 2x10 pin (1.25mm) wafer

#### • (RS232 Mode)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
COM1		COM2	
1	+5V	2	+5V
3	DCD	4	DCD
5	DSR	6	DSR
7	RXD	8	RXD
9	RTS	10	RTS
11	TXD	12	TXD
13	CTS	14	CTS
15	DTR	16	DTR
17	RI	18	RI
19	GND	20	GND

Note:

1. COM 1 Default RS232, RS485 / RS422 by BIOS control.
2. COM 1 & COM 2 The pin9 RI can be modify to Power to supply device.  
The power voltage can be set +12V or +5V.  
The RI change Voltage function set by BOM control. Default is RI signal.
3. COM 1 & COM 2 Pin 10 provides +5V for external device.
4. COM 2 only support RS232.

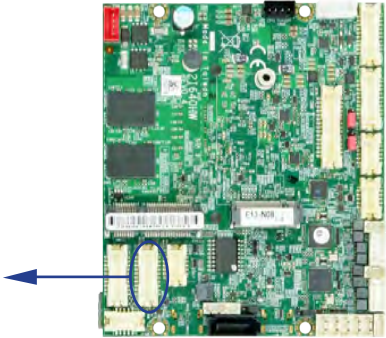
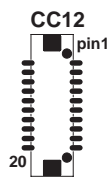
#### • (RS485 Mode)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
COM1			
1	+5V		
3	DATA-		
5	NC		
7	DATA+		
9	NC		
11	NC		
13	NC		
15	NC		
17	RI		
19	GND		



• (RS422 Mode)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
COM1			
1	+5V		
3	TX-		
5	NC		
7	TX+		
9	NC		
11	RX+		
13	NC		
15	RX-		
17	RI		
19	GND		



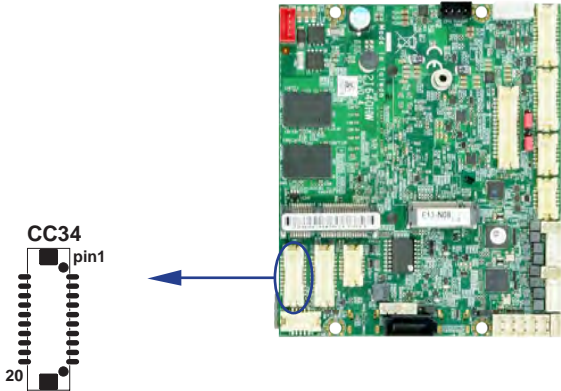
**CC34: COM3 / COM4 2x10 pin (1.25mm) wafer**

**• (RS232 Mode)**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
COM3		COM4	
1	+5V	2	+5V
3	DCD	4	DCD
5	DSR	6	DSR
7	RXD	8	RXD
9	RTS	10	RTS
11	TXD	12	TXD
13	CTS	14	CTS
15	DTR	16	DTR
17	RI	18	RI
19	GND	20	GND

Note:

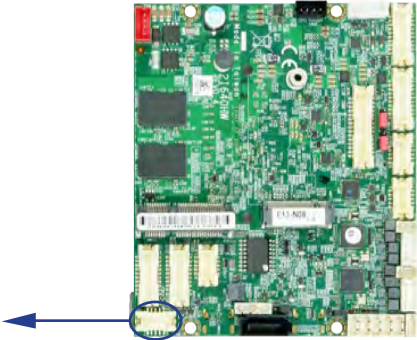
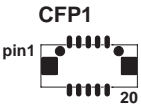
- 1. COM 3 & COM 4 The pin9 RI can be modify to Power to supply device.  
The power voltage can be set +12V or +5V.  
The RI change Voltage function set by BOM control. Default is RI signal.
- 3. COM 3 & COM 4 Pin 10 provides +5V for external device.
- 4. COM 3 & COM 4 only support RS232.



### 3-8 Front Panel Pin Header

● CFP1: Front Panel 2x5 pin (1.25mm) 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+

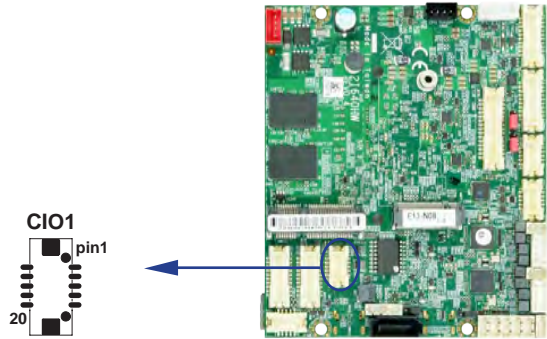


### 3-9 DIO Interface

● CIO1: DIO 0~3 2x5 pin (1.25mm) 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

Note: DIO and WDT function from SIO F81966D-I.



● WDT For F81966D-I 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.

# 3-9-1 IO Device: F81966 DIO under Windows

## The Sample code source you can download from

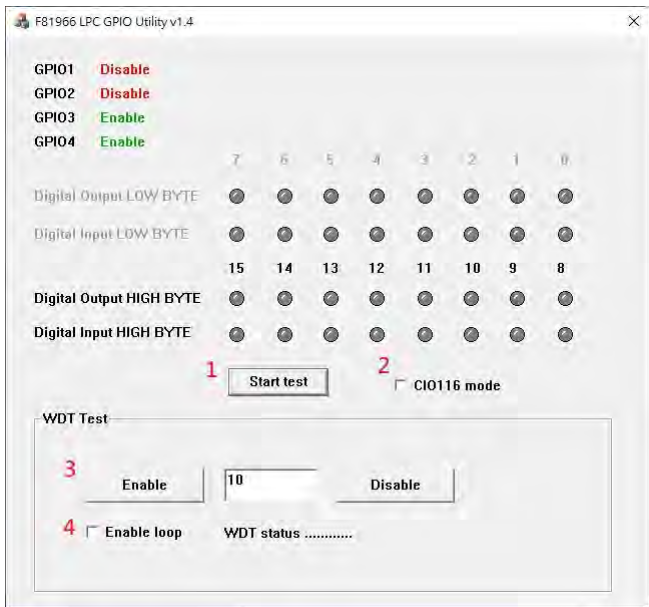
[http://tprd.info/lexwiki/index.php/IO\\_Device:F81966\\_LPC\\_DIO\\_under\\_Windows](http://tprd.info/lexwiki/index.php/IO_Device:F81966_LPC_DIO_under_Windows)

Source file: F81966\_LPC\_GPIO\_UTILITY\_Src\_v1.5.zip

Binary file: F81966\_LPC\_GPIO\_UTILITY\_Bin\_x86\_v1.5.zip F81966\_LPC\_GPIO\_UTILITY\_Bin\_x64\_v1.5.zip

F81966 DLL: F81966\_DLL\_x32\_v1.0.zip F81966\_DLL\_x64\_v1.0.zip

## Introduction F81966 DIO



1. Start test Button, Send bits one by one and one by one receive
2. CIO116 mode for CIO116 module use
3. Set time countdown, If the end of the countdown, the trigger signal to reboot
4. Enable loop, Continuously reset the WDT to ensure that when the system is normal, the restart signal will not be triggered.

## F81966\_DLL Function

```

F81966_DLL_API bool F81966_LPC_Init(pF81966_status status);

F81966_DLL_API BYTE F81966_LPC_Digital_Read_LOW();
F81966_DLL_API void F81966_LPC_Digital_Write_LOW(BYTE byteValue);
F81966_DLL_API BYTE F81966_LPC_Digital_Read_HIGH();
F81966_DLL_API void F81966_LPC_Digital_Write_HIGH(BYTE byteValue);

F81966_DLL_API void F81966_LPC_Set_WDT_Enable(BYTE byteValue);
F81966_DLL_API void F81966_LPC_Set_WDT_Disable();

```

## Digital Input / Output test

Note when using the following boards: 2I640HW

CIO1 needs to be controlled by CIO3

	Digital output Low Byte		Digital iutput Low Byte	
CIO1	Do	0	Di	0
	Do	1	Di	1
	Do	2	Di	2
	Do	3	Di	3
CIO2	Do	4	Di	4
	Do	5	Di	5
	Do	6	Di	6
	Do	7	Di	7

	Digital output High Byte		Digital iutput High Byte	
CIO3	Do	8	Di	8
	Do	9	Di	9
	Do	10	Di	10
	Do	11	Di	11
CIO4	Do	12	Di	12
	Do	13	Di	13
	Do	14	Di	14
	Do	15	Di	15

## sample code

```
Set CIO1 CIO2 Digital Output all high  
F81966_LPC_Digital_Write_LOW(256);
```

```
Set CIO1 CIO2 Digital Output all low  
F81966_LPC_Digital_Write_LOW(0);
```

```
Set CIO1 Digital Output bit 4 high  
F81966_LPC_Digital_Write_LOW(16);
```

```
Set CIO2 Digital Output bit 10 high  
F81966_LPC_Digital_Write_HIGH(4);
```

```
Read Din  
value = F81966_LPC_Digital_Read_LOW();
```

## Watch Dog test sample code

```
Set WDT 10 sec  
F81966_LPC_Set_WDT_Enable(10);
```

```
Disable WDT  
F81966_LPC_Set_WDT_Disable();
```

## 3-9-2 IO Device: F81966 DIO under Linux console

The Sample code source you can download from

[http://tprd.info/lexwiki/index.php/IO\\_Device:F81966\\_LPC\\_DIO\\_under\\_Linux\\_console](http://tprd.info/lexwiki/index.php/IO_Device:F81966_LPC_DIO_under_Linux_console)

Source file: F81966\_DIO\_v1.1\_Src\_L.tar.gz

Binary file: F81966\_DIO\_v1.1\_Bin\_x64\_L.tar.gz F81966\_DIO\_v1.1\_Bin\_x32\_L.tar.gz

F81966 Library: F81966\_LIB\_v1.1\_x64\_L.tar.gz F81966\_LIB\_v1.1\_x32\_L.tar.gz

### Introduction F81966 DIO

```
root@ubuntu: /home/test/Desktop/f81966/F81966_DIO
root@ubuntu: /home/test/Desktop/f81966/F81966_DIO# ./f81966 -h
F81966 OPEN FAIL!!!!
Usage: ./f81966 [OPTION] ... [--mode value]

-h,--help                printf this help and exit
-s DOx, --setDo value    | value:number of bits
-r DIX, --readD value    | value:number of bits
--CIO12                  | test CIO1,CIO2
--CIO34                  | test CIO3,CIO4
Example:
./f81966 --CIO12

root@ubuntu: /home/test/Desktop/f81966/F81966_DIO#
```

1. Start test Button, Send bits one by one and one by one receive
2. CIO116 mode for CIO116 module use
3. Set time countdown, If the end of the countdown, the trigger signal to reboot
4. Enable loop, Continuously reset the WDT to ensure that when the system is normal, the restart signal will not be triggered.



## F81966\_DLL Function

```
bool F81966_OPEN();
void F81966_Init();
void F81966_LPC_Write(BYTE LDNData, BYTE reg, BYTE value);
BYTE F81966_LPC_Read(BYTE LDNData, BYTE reg);
void F81966_LPC_Digital_Write_LOW(BYTE byteValue);
void F81966_LPC_Digital_Write_HIGH(BYTE byteValue);
BYTE F81966_LPC_Digital_Read_LOW();
BYTE F81966_LPC_Digital_Read_HIGH();
void F81966_LPC_Set_WDT_Enable(BYTE byteValue);
void F81966_LPC_Set_WDT_Disable();
void EntryLPC();
void ExitLPC();
```

## Digital Input / Output test

Note when using the following boards: 2I640HW  
CIO1 needs to be controlled by CIO3

	Digital output Low Byte		Digital iutput Low Byte	
CIO1	Do	0	Di	0
	Do	1	Di	1
	Do	2	Di	2
	Do	3	Di	3
CIO2	Do	4	Di	4
	Do	5	Di	5
	Do	6	Di	6
	Do	7	Di	7

	Digital output High Byte		Digital iutput High Byte	
CIO3	Do	8	Di	8
	Do	9	Di	9
	Do	10	Di	10
	Do	11	Di	11
CIO4	Do	12	Di	12
	Do	13	Di	13
	Do	14	Di	14
	Do	15	Di	15

## sample code

```
Set CIO1 CIO2 Digital Output all high  
F81966_LPC_Digital_Write_LOW(256);
```

```
Set CIO1 CIO2 Digital Output all low  
F81966_LPC_Digital_Write_LOW(0);
```

```
Set CIO1 Digital Output bit 4 high  
F81966_LPC_Digital_Write_LOW(16);
```

```
Set CIO2 Digital Output bit 10 high  
F81966_LPC_Digital_Write_HIGH(4);
```

```
Read Din  
value = F81966_LPC_Digital_Read_LOW();
```

## Watch Dog test

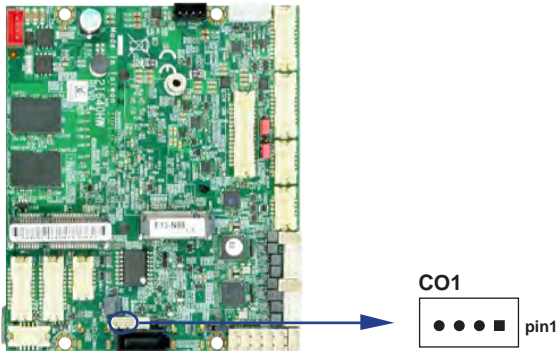
### sample code

```
Set WDT 10 sec  
F81966_LPC_Set_WDT_Enable(10);
```

```
Disable WDT  
F81966_LPC_Set_WDT_Disable();
```

**3-10 CO1: SMBus 1x4 pin (1.25mm) wafer**

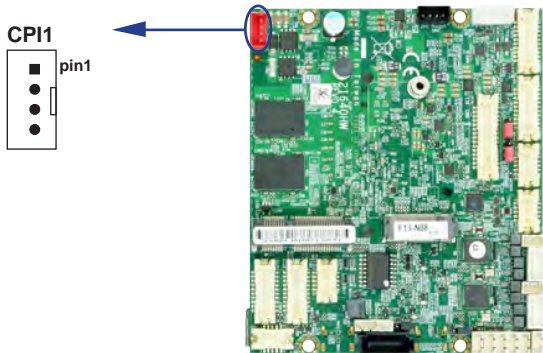
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	2	GND
3	SMB-Clock	4	SMB-Data



**3-11 CPI1: DC Power input 1x4 pin (2.0mm) wafer (RED)**

PIN NO.	DESCRIPTION
1,4	GND
2,3	DC-IN

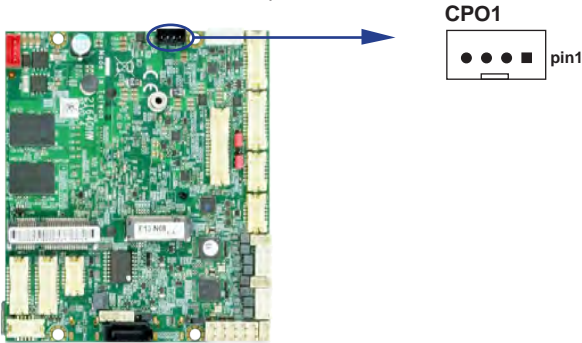
Note: Very important check DC-in Voltage.



**3-12 CPO1: +12V / +5V DC voltage output**  
**1x4 pin (2.0mm) wafer (Black)**

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

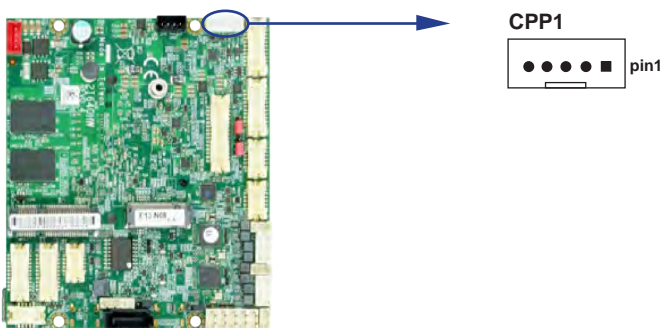
Note: Attention! Check Device Power in spec.



**3-13 CPP1: LVDS Panel backlight power**  
**1x5 pin (2.0mm) wafer**

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

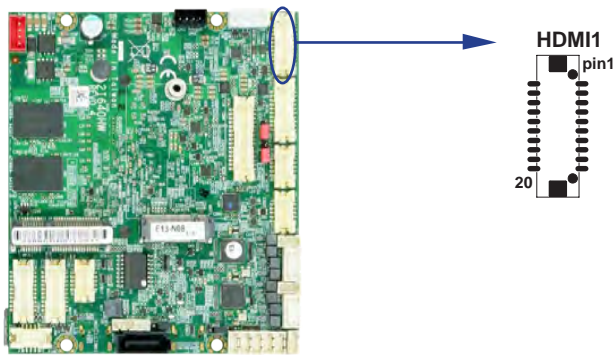
Note: CPP1 PIN 3 and LVDS1 PIN1 is same signal.



### 3-14 Display Interface

● HDMI1: HDMI 2x10 pin (1.25mm) wafer

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TMDS DATA2-	2	NC
3	TMDS DATA2+	4	NC
5	TMDS DATA1-	6	GND
7	TMDS DATA1+	8	GND
9	TMDS DATA0-	10	GND
11	TMDS DATA0+	12	GND
13	TMDS CLK-	14	+5V
15	TMDS CLK+	16	+5V
17	DDC CLOCK	18	+5V
19	DDC DATA	20	Hot Plug Detect

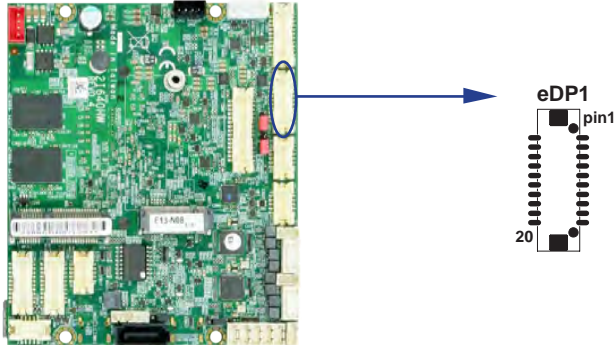


• **EDP1: eDP interface 2x10 pin (1.25mm) wafer**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Lane-0-DATA-	2	+12V
3	Lane-0-DATA+	4	+12V
5	Lane-1-DATA-	6	GND
7	Lane-1-DATA+	8	GND
9	Backlight Enable	10	GND
11	PWM dimming	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:

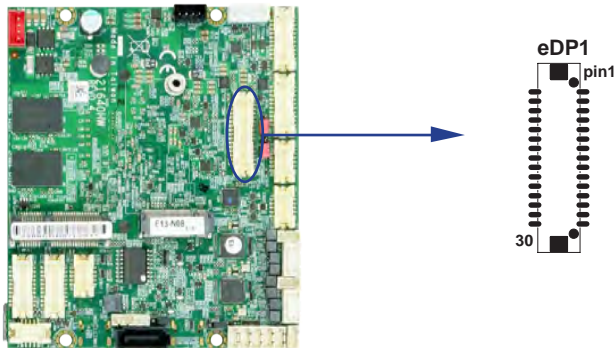
1. eDP interface support 2 lanes.
2. JVL2: eDP panel +5V / +3.3V (default) Voltage select.
3. PIN 9 for panel backlight enable. +3.3V Level.
4. PIN 11 for panel backlight dimming control.



### 3-15 LVDS1: LVDS interface 2x15 pin (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	HPD	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 / 24 bits two channel.
  - 2. JVL1: LVDS panel +5V / +3.3V (default) Voltage select.
  - 3. LVDS1 PIN 1 for panel backlight dimming control.



• LVDS Panel resolution table list

Item	Resolution	Channel	bits
1	640 x 480	1	18
2	800 x 600	1	18
3	1024 x 768	1	18
4	800 x 480	1	18
5	1024 x 600	1	18
6	1280 x 800	1	18
7	1366 x 768	1	18
8	800 x 600	1	24
9	1024 x 768	1	24
10	1280 x 800	1	24
11	1366 x 768	1	24
12	1280 x 1024	2	24
13	1440 x 900	2	24
14	1600 x 1200	2	24
15	1920 x 1080	2	24

Note: The item 3 is default resolution.



### 3-16 CT1: Touch screen 2x5 pin (1.25mm) USB interface

• 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.

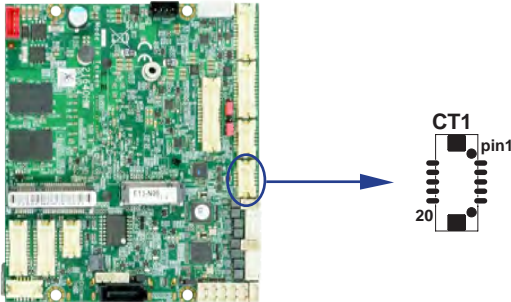
• For 4-wire type pin define

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.

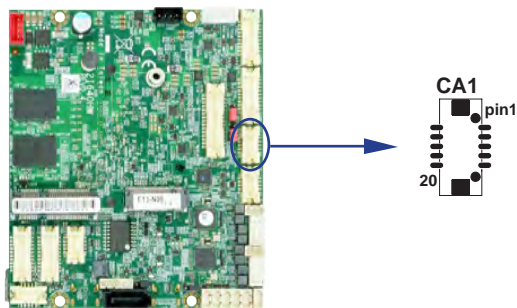
• For 5-wire type pin define

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



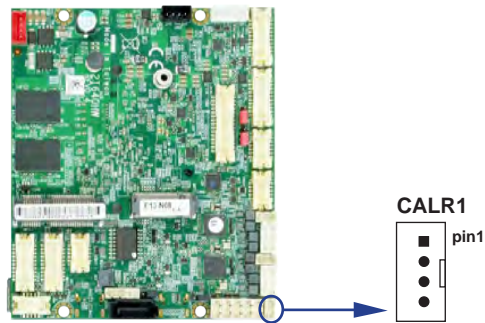
**3-17 CA1: Line-out / Line-in / MIC-in 2x5 pin (1.25mm) wafer**

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



**3-18 CALR1: Amplifier Line-out Right & Left channel 1x4 pin (1.25mm) wafer**

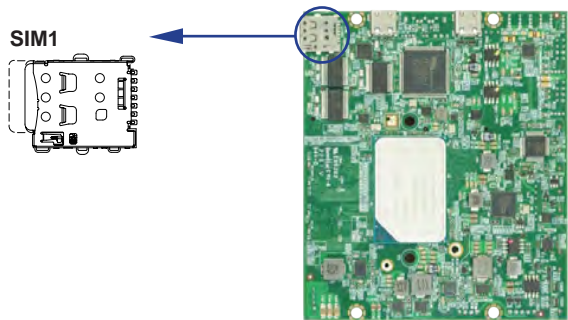
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Left +	2	Left -
3	Right -	4	Right +



### 3-19 SIM1: Nano SIM Card Push-Push

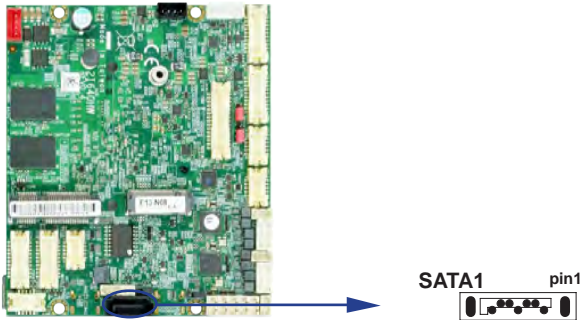
● Follow ISO 7816-2 Smart Card Standard.

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



### 3-20 SATA1: SATA port 1x7pin Connector

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



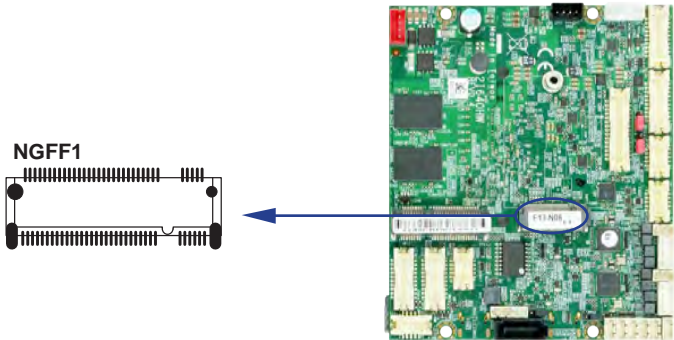
### 3-21 NGFF1: PCI Express M.2 B key 2242 H=8.5 sockets 75pin

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	SATA/USB3.0 PW config	2	+3.3V / +3.7V
3	GND	4	+3.3V / +3.7V
5	GND	6	FULL_CARD_PWR
7	USB2.0_P	8	W_DISABLE_1
9	USB2.0_N	10	M2_LED
11	GND		
B Key notch			
		20	NC
21	GND	22	NC
23	NC	24	NC
25	NC	26	W_DISABLE_2
27	GND	28	NC
29	USB3Rn	30	SIM_RST_M2
31	USB3Rp	32	SIM_CLK_M2
33	GND	34	SIM_DATA_M2
35	USB3Tn	36	SIM_PWR_M2
37	USB3Tp	38	SIM_RST_M2
39	GND	40	NC
41	SATA-RX+	42	NC
43	SATA-RX-	44	NC
45	GND	46	NC
47	SATA-TX-	48	NC
49	SATA-TX+	50	PREST
51	GND	52	NC
53	NC	54	NC
55	NC	56	NC
57	GND	58	NC
59	NC	60	NC

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
61	NC	62	NC
63	NC	64	NC
65	NC	66	SIM_DET
67	MD_RESET_N	68	NC
69	NC	70	+3.3V / +3.7V
71	GND	72	+3.3V / +3.7V
73	GND	74	+3.3V / +3.7V
75	NC		

Note:

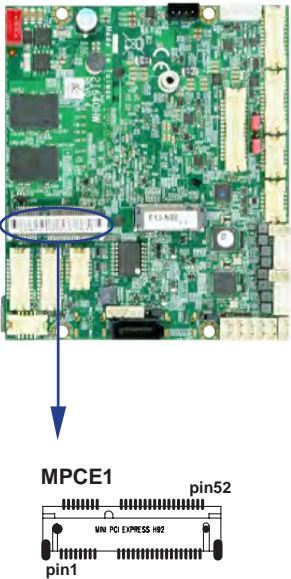
- 1. 4G LTE device VCC voltage is +3.7V.
- 2. Support USB 3.0 / USB 2.0 & SATA signal.



### 3-22 MPCE1 PCI Express mini card

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

Note: Support USB 2.0 & PCIe signal.



---

# 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.

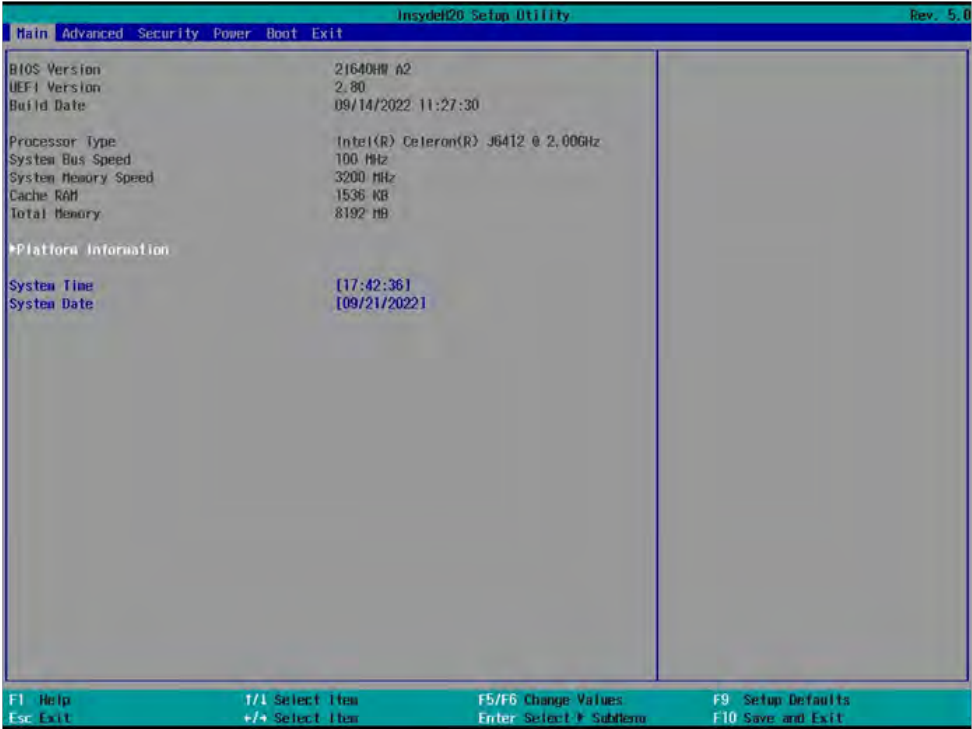
Press Page Up / Page Down or +/- keys to modify the BIOS parameters for the active option.

## 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>.

## 4-2 BIOS Menu Screen & Function Keys

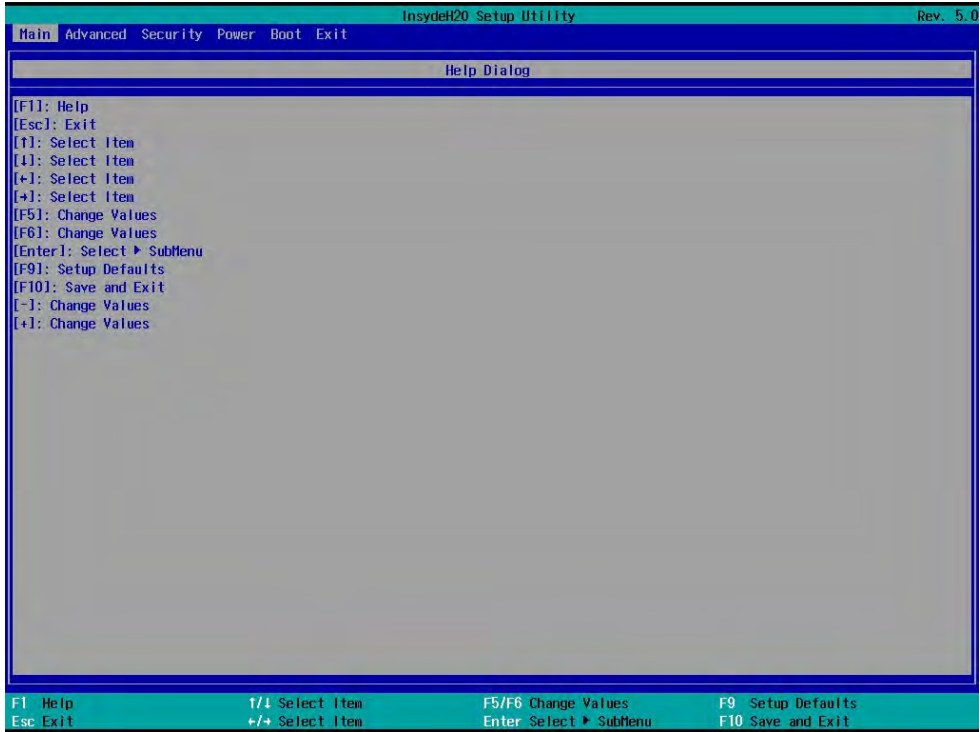


In the above BIOS Setup main menu of, you can see several options. We will explain these options step by step in the following pages of this chapter, but let us first see a short description of the function keys you may use here:

- 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 Getting 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>.

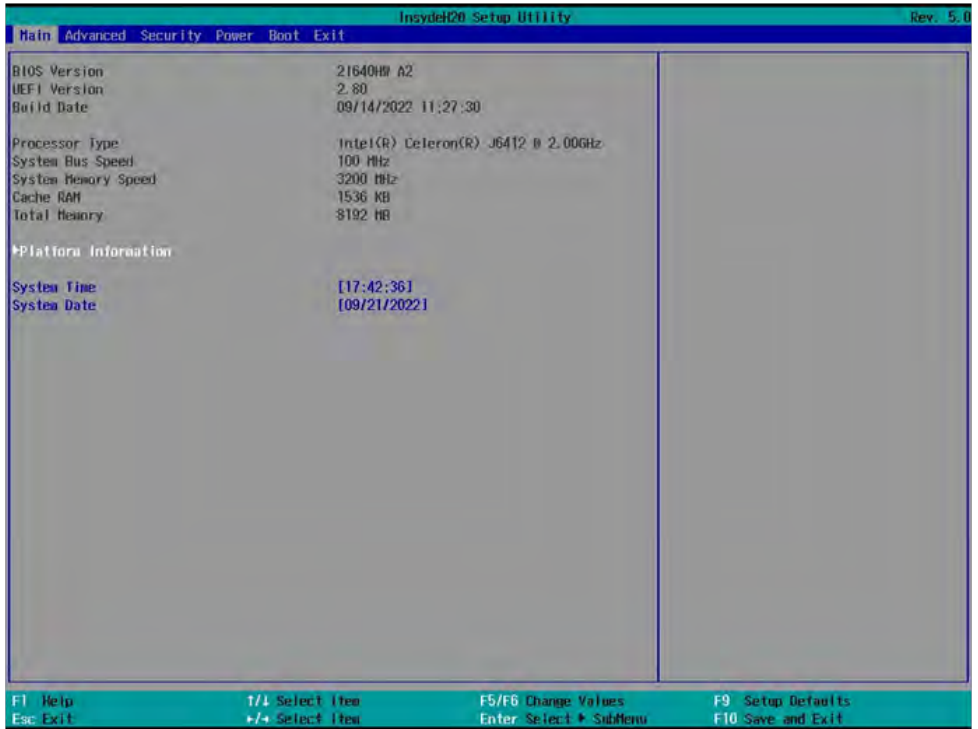
### 4-4 Menu Bars

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

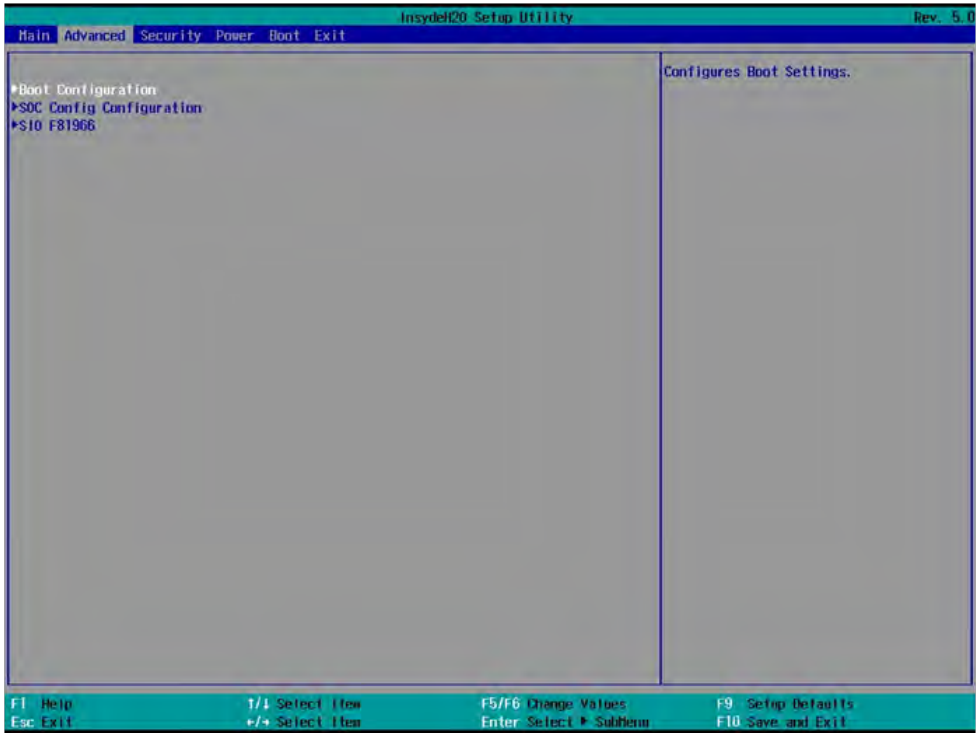
Set the Time. Please use [Tab] to switch between data elements.

### Platform Information

Shows the detail information of CPU & PCH

InsydeQ20 Setup Utility		Rev. 5.0								
<b>Main</b>										
Platform Information										
Reference SIC Version	1.0.0									
FSP Information										
FSP version	09.04.25.11									
RC version	09.04.25.11									
Build Date	09/08/2022 09:43									
FSP Mode	API Mode									
Compute Die Information										
CPUID:	0x90661 (ElkhartLake ULT)									
CPU Speed:	2000 Mhz									
CPU Stepping:	B0 Stepping									
CPU SKU:	Ehl Sku 1A 10.0W (0x02)									
Number Of Processors:	4 Core(s) / 4 Thread(s)									
Microcode Rev:	00000016									
GT Info:	GT2 (0x4555)									
L1 Data Cache:	32 KB x 4									
L1 Instruction Cache:	32 KB x 4									
L2 Cache:	1536 KB x 4									
L3 Cache:	4096 KB									
IGFX GOP Version	18.0.1031									
Memory RC Version	0.0.4.111									
PCI Information										
Name	EHL PCI									
PCI SKU	HCC SKU 0									
Stepping	B1									
ChipsetInit Revision	A.0 (80v10)									
Intel ME Version / SKU	15.40.27.2664 / CONSUMER									
PHC Firmware Version	154.1.10.1026									
<table border="0"> <tr> <td>F1 Help</td> <td>T/1 Select Item</td> <td>F5/F6 Change Values</td> <td>F9 Setup Defaults</td> </tr> <tr> <td>Esc Exit</td> <td>+/- Select Item</td> <td>Enter Select &gt; SubMenu</td> <td>F10 Save and Exit</td> </tr> </table>			F1 Help	T/1 Select Item	F5/F6 Change Values	F9 Setup Defaults	Esc Exit	+/- Select Item	Enter Select > SubMenu	F10 Save and Exit
F1 Help	T/1 Select Item	F5/F6 Change Values	F9 Setup Defaults							
Esc Exit	+/- Select Item	Enter Select > SubMenu	F10 Save and Exit							

# 4-6 Advanced



## Boot Configuration

Please refer section 4-6-1

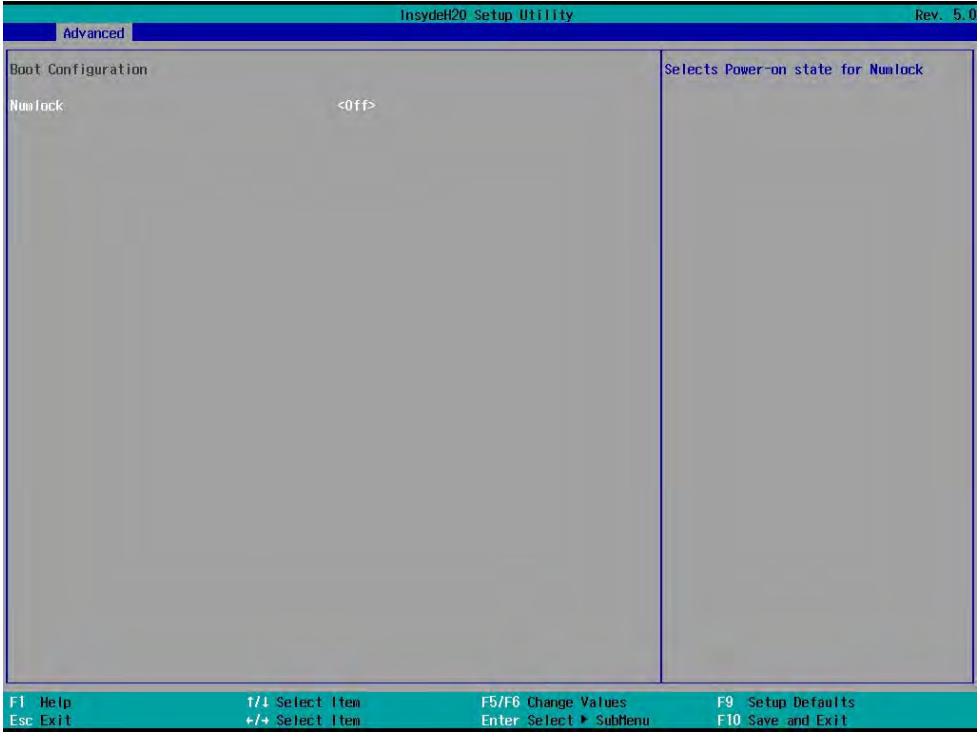
## SOC Config Configuration

Please refer section 4-6-2

## SIO F81966

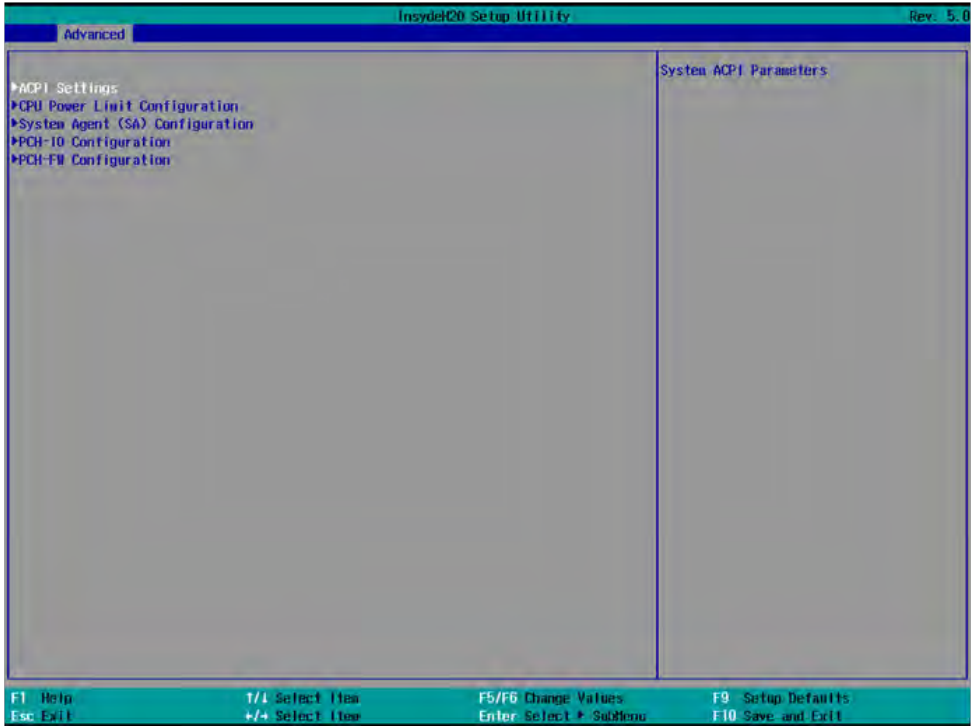
Please refer section 4-6-3

## 4-6-1 Boot Configuration



To select Power-on state for NumLock, default is <off>

## 4-6-2 SOC Config Configuration



### ACPI Settings

Please refer section 4-6-2-1

### CPU Power Limit Configuration

Please refer section 4-6-2-2

### System Agent (SA) Configuration

Please refer section 4-6-2-3

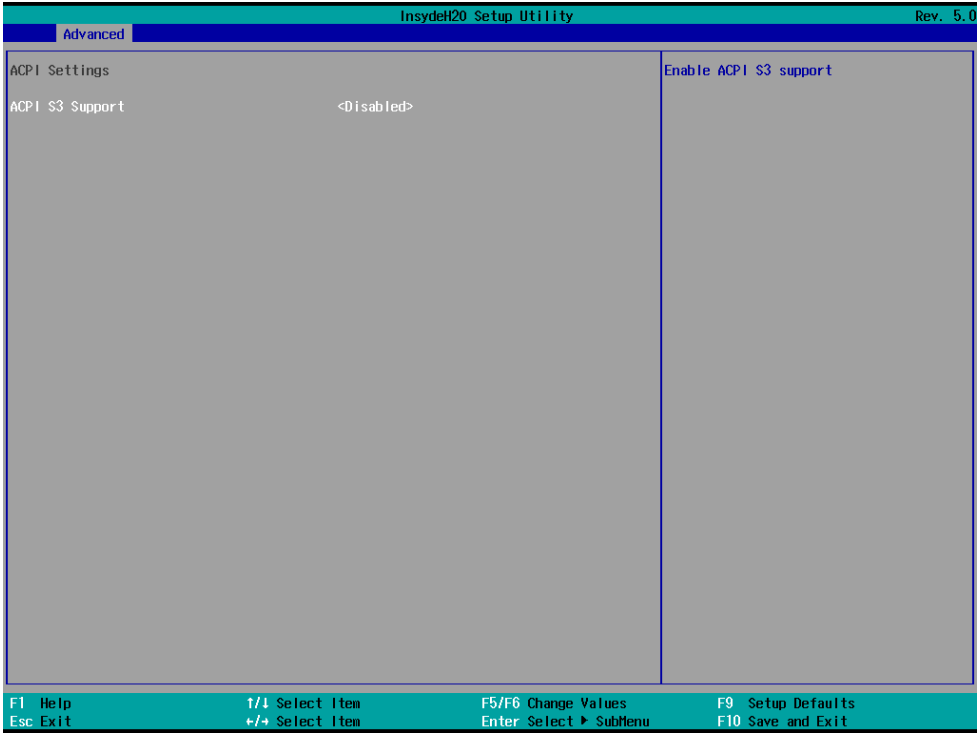
### PCH-IO Configuration

Please refer section 4-6-2-4

### PCH-FW Configuration

Please refer section 4-6-2-5

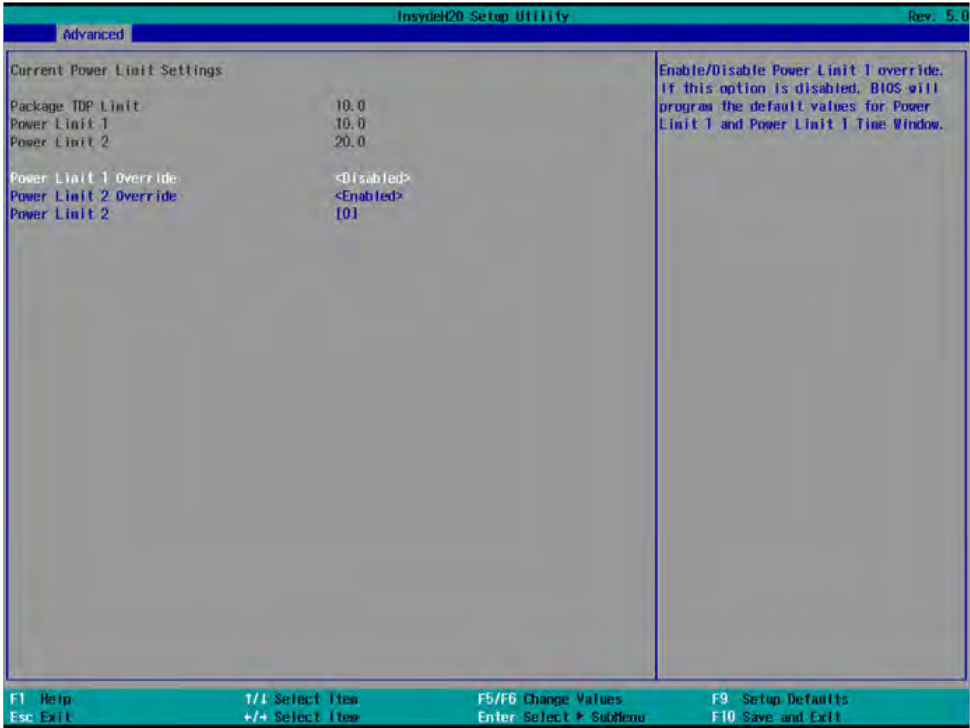
## 4-6-2-1 ► ACPI Settings



### ACPI S3 Support

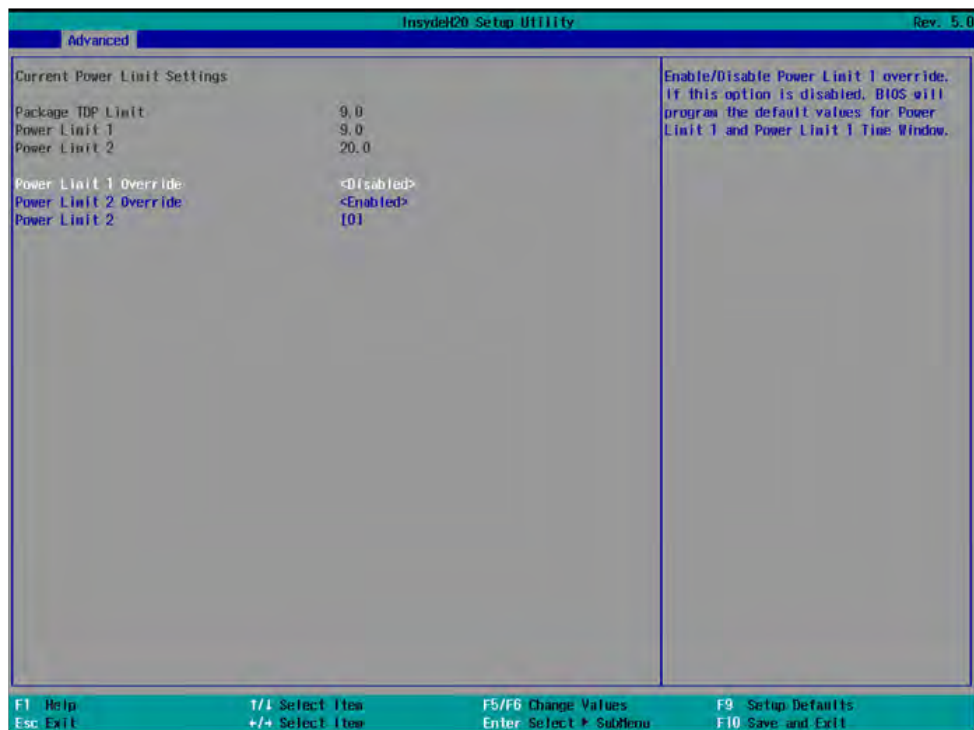
To enable BIOS support security device or not, default is Enabled.

### 4-6-2-2 ► CPU Power Limit Configuration



The setting follows INTEL Celeron J6412 CPU power limit default configuration.





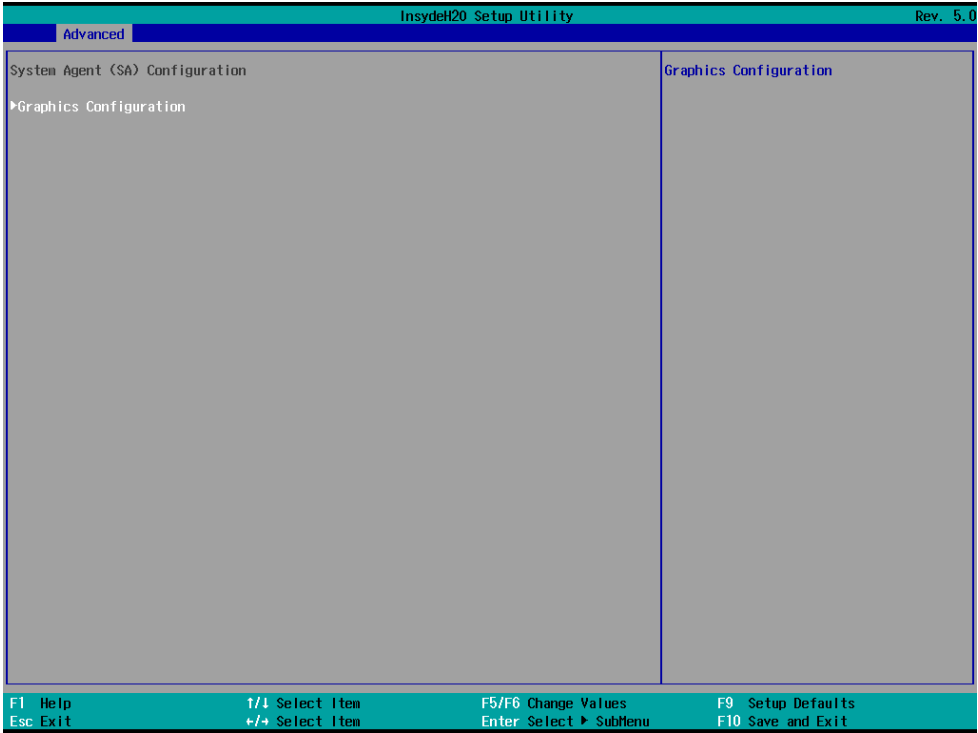
The setting follows INTEL Atom x6413E power limit default configuration.

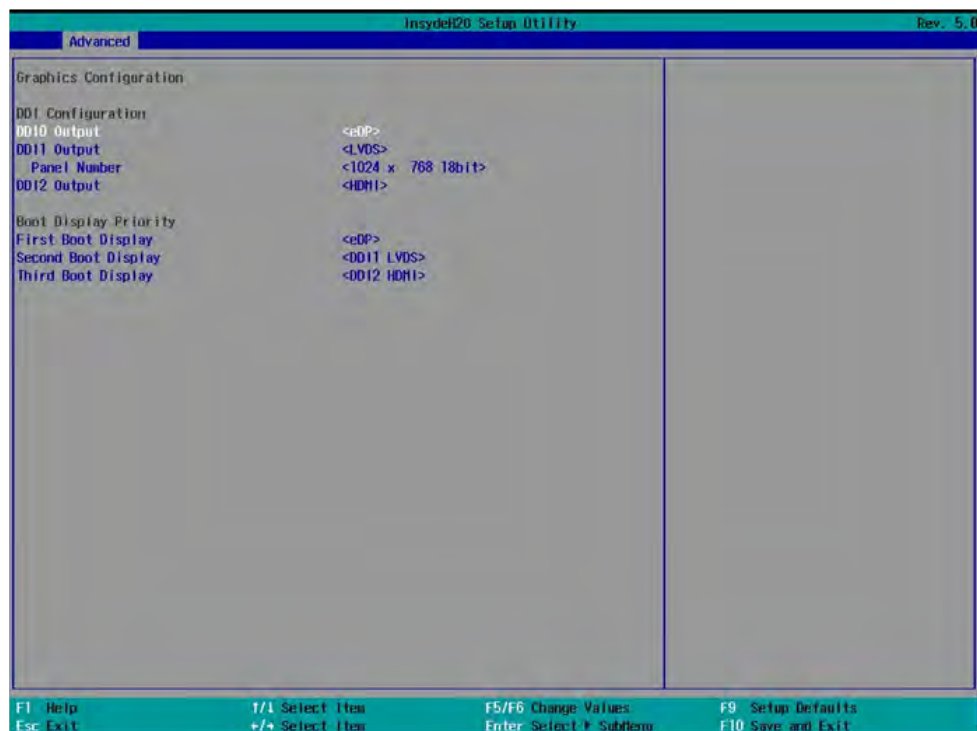


## Power Limit Override

Enable / disable PL1 / PL2 and enter the power numerical value from 0 to 20000 to get higher or lower CPU TDP

### 4-6-2-3 ► System Agent (SA) Configuration



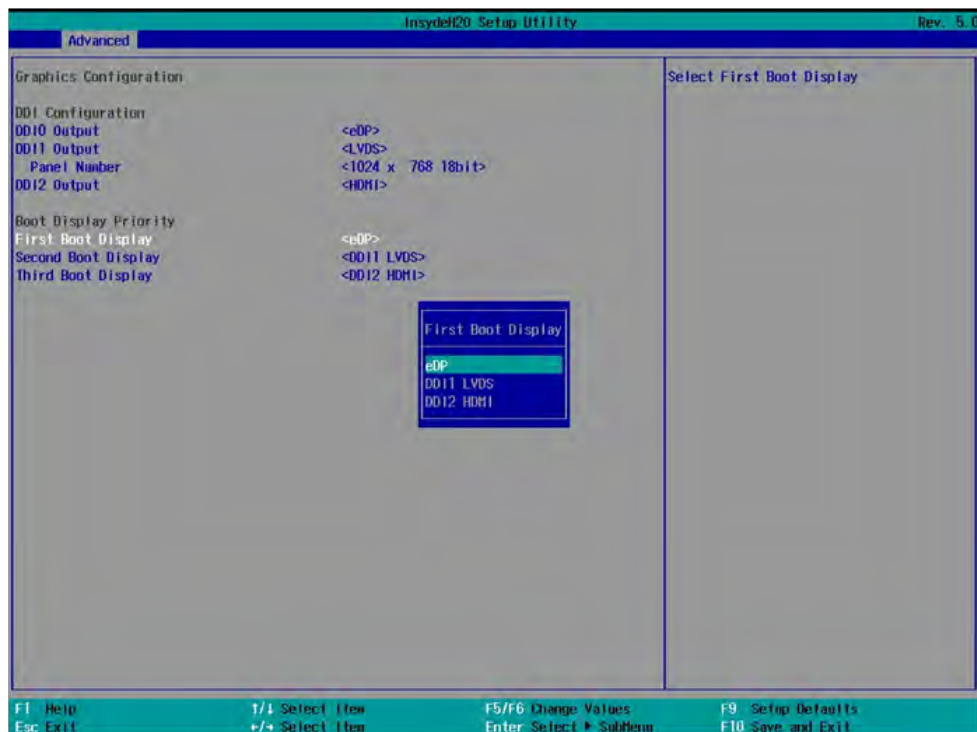




## Graphic Configuration

### DDI Configuration

To enable or disable which DDI output for Display and to change the LVDS resolution.



## Boot Display Priority

### First Boot Display

To select First Boot Display priority, there are eDP, DDI1 LVDS, DDI2 HDMI, default is eDP

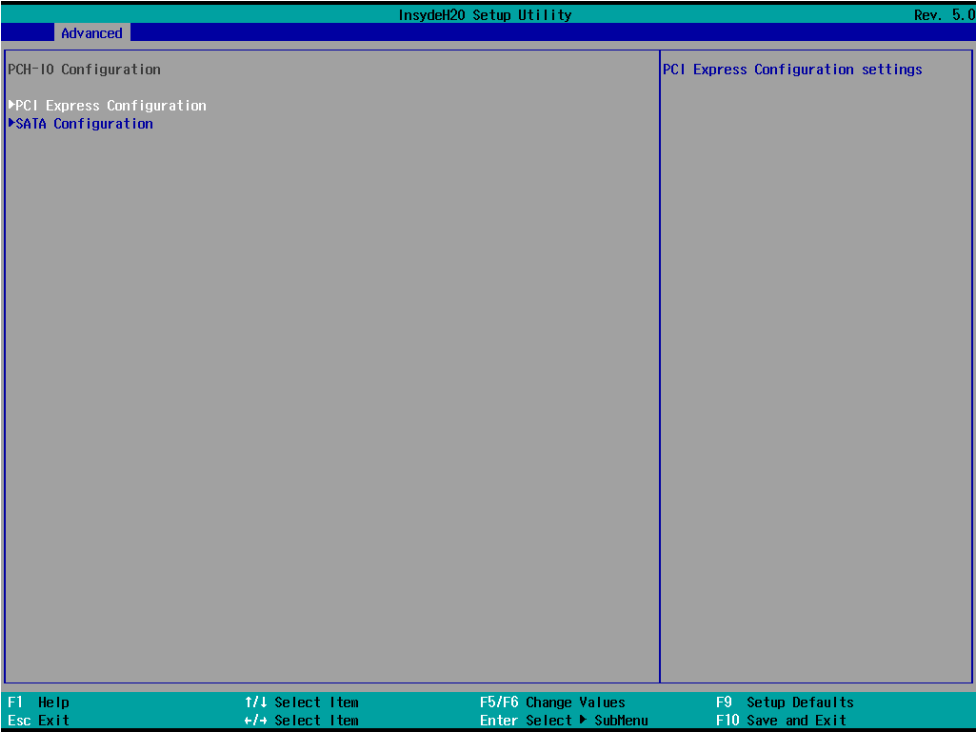
### Second Boot Display

To select Second Boot Display priority, there are DDI1 LVDS, DDI2 HDMI, default is DDI1 LVDS

### Third Boot Display

To select First Boot Display priority, there is DDI2 HDMI

# 4-6-2-4 ► PCH-IO Configuration



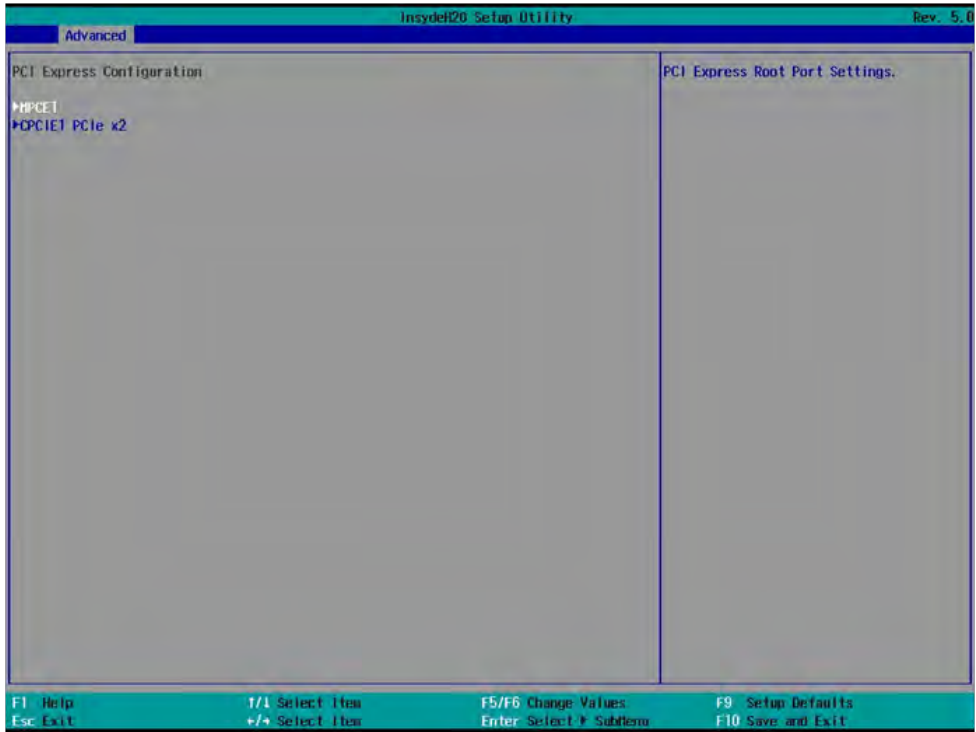
## PCI Express Configuration

Please refer section 4-6-2-4-1

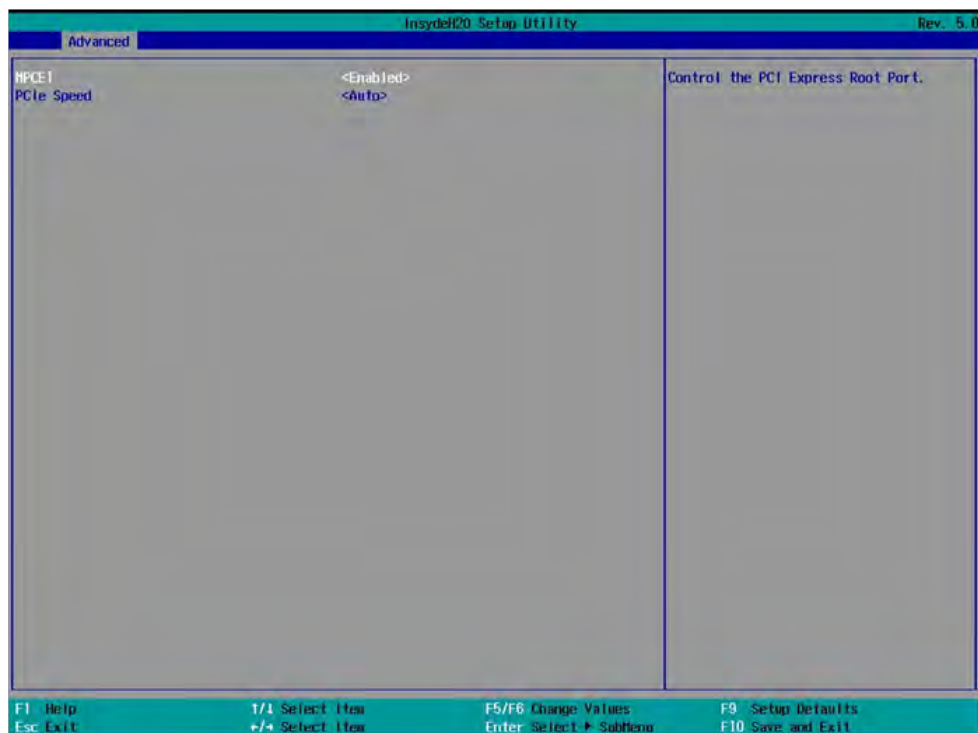
## SATA Configuration

Please refer section 4-6-2-4-2

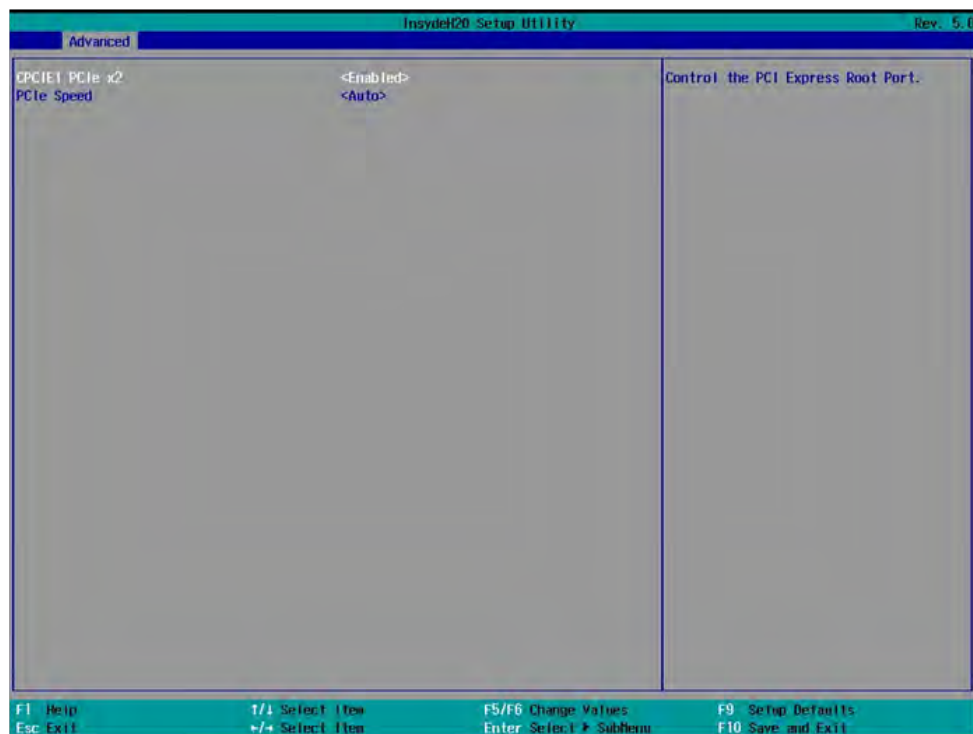
# 4-6-2-4-1 ► PCI Express Configuration





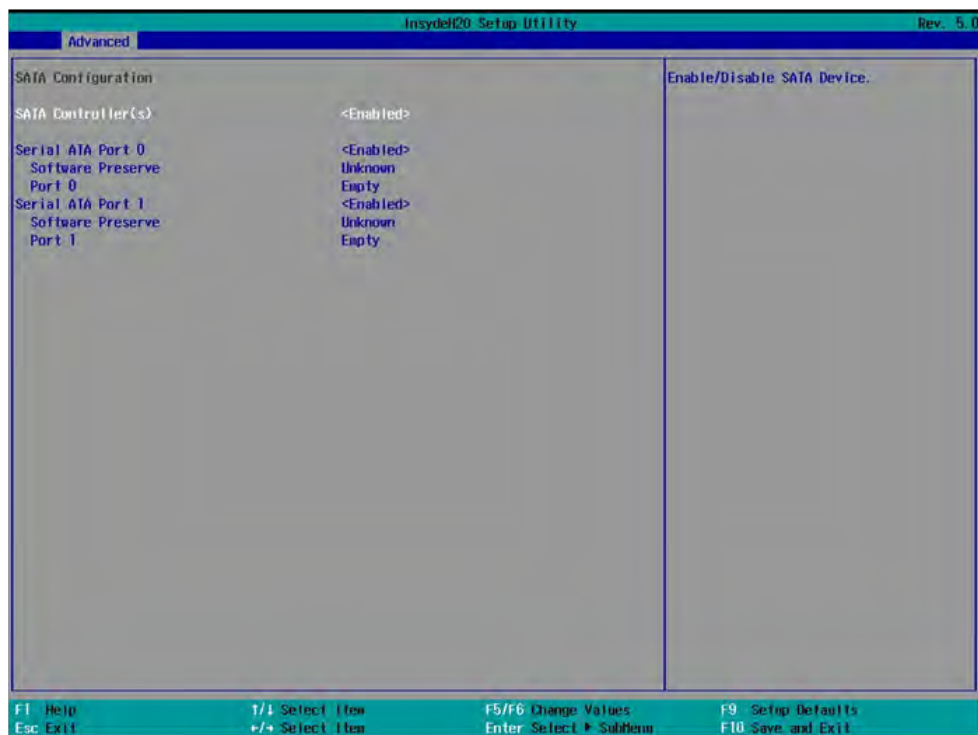


To select MPCE1 device enabled or not and to change the PCIe Speed, there are Auto, Gen1, Gen2, Gen3, default is Auto



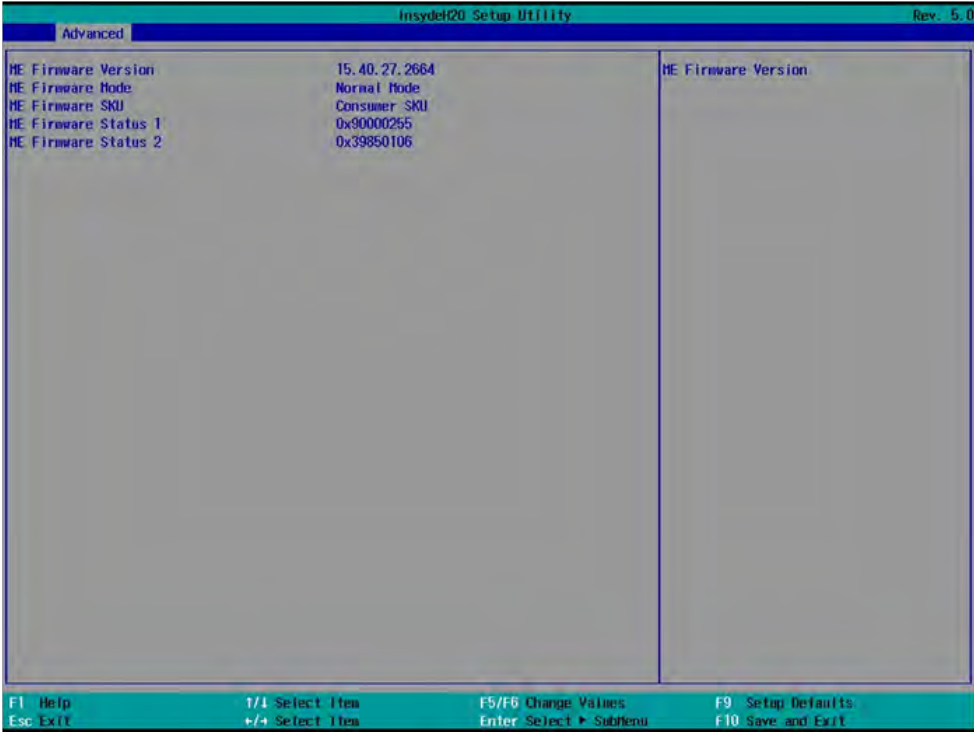
To select CPCIe1 (Type C) device enabled or not and to change the PCIe Speed, there are Auto, Gen1, Gen2, Gen3, default is Auto

## 4-6-2-4-2 ► SATA Configuration

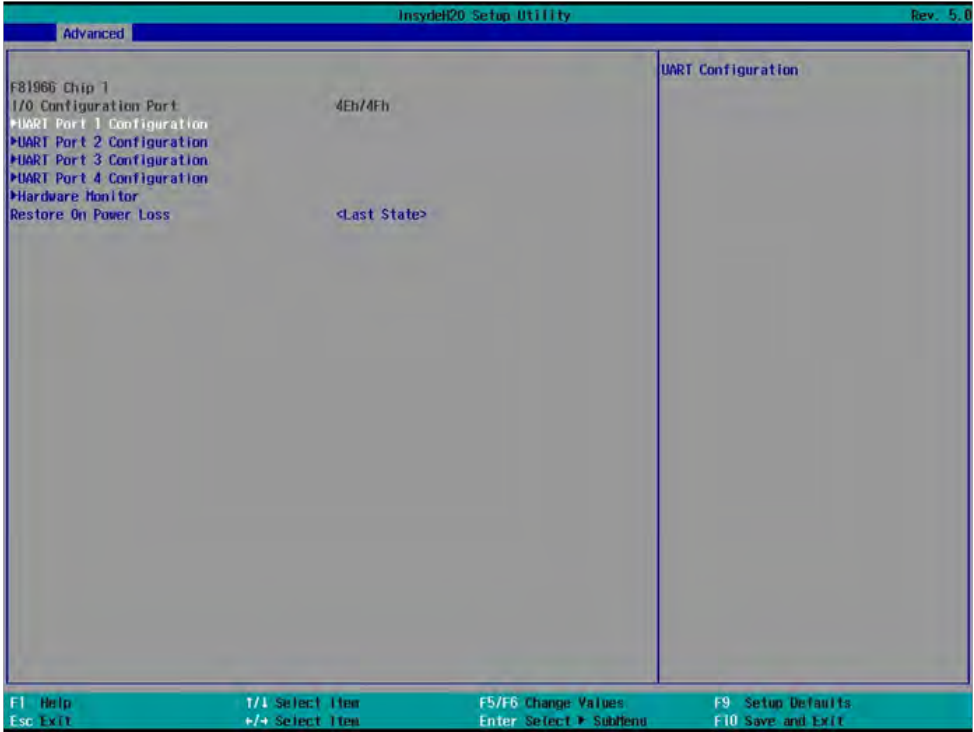


To select SATA port & NGFF1 M.2 SATA device enabled or not.

### 4-6-2-5 ► PCH-FW Configuration



### 4-6-3 SIO F81966



#### UART Port 1 Configuration

Please refer section 4-6-3-1

#### UART Port 2 Configuration

Please refer section 4-6-3-2

#### UART Port 3 Configuration

Please refer section 4-6-3-3

#### UART Port 4 Configuration

Please refer section 4-6-3-4

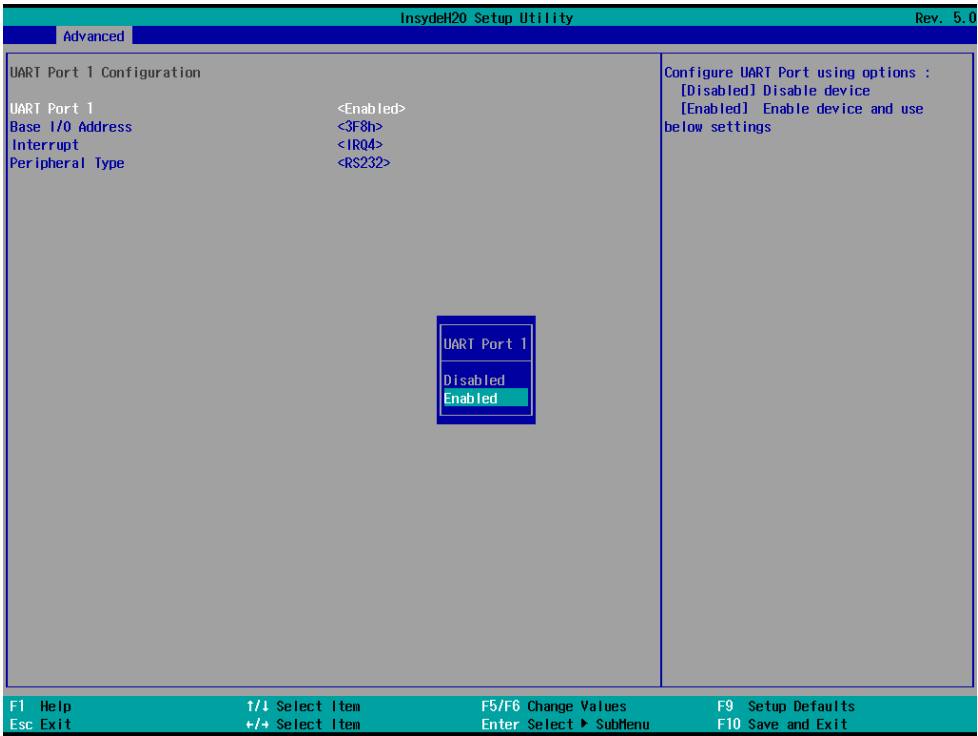
#### Hardware Monitor

Please refer section 4-6-3-5

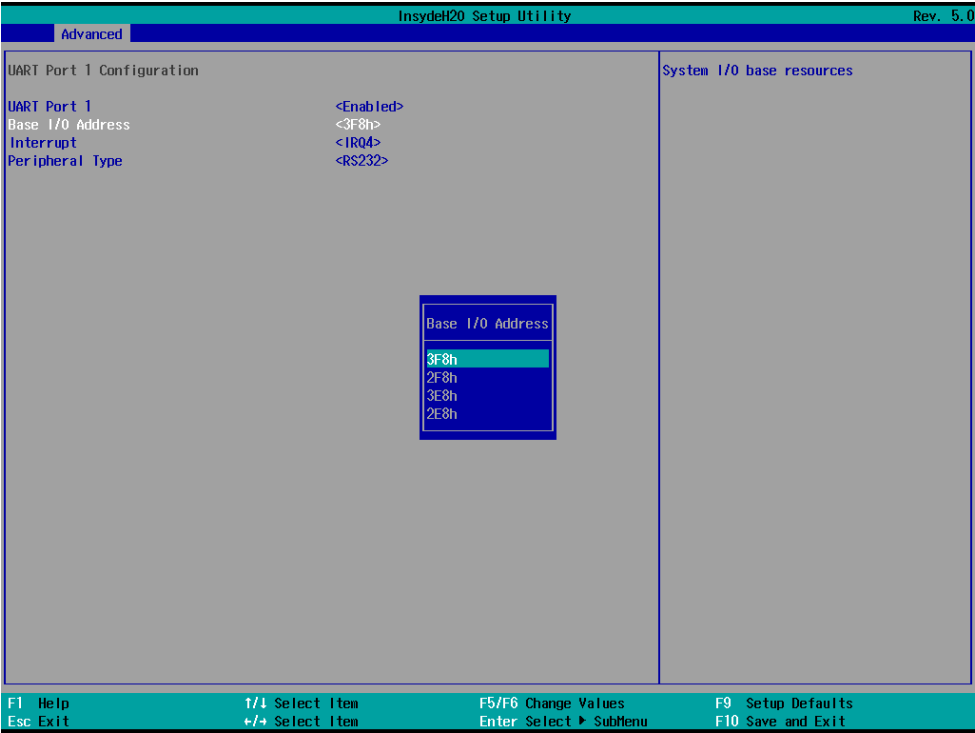
#### Restore on Power Loss

Please refer section 4-6-3-6

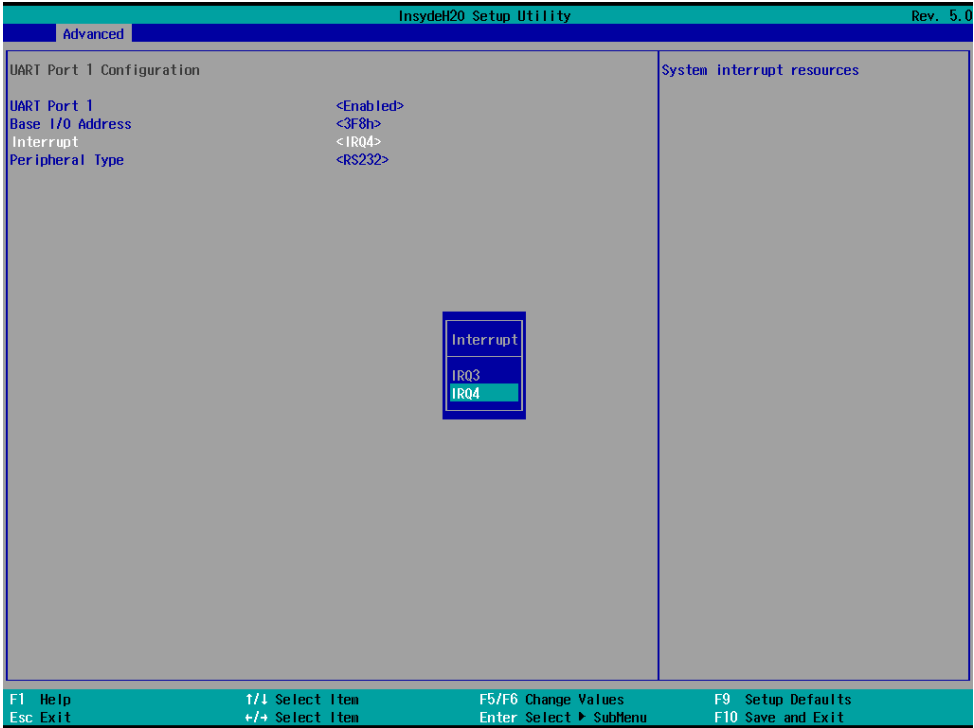
### 4-6-3-1 ► UART Port 1 Configuration



To Enable Serial port or not, default is Enabled.

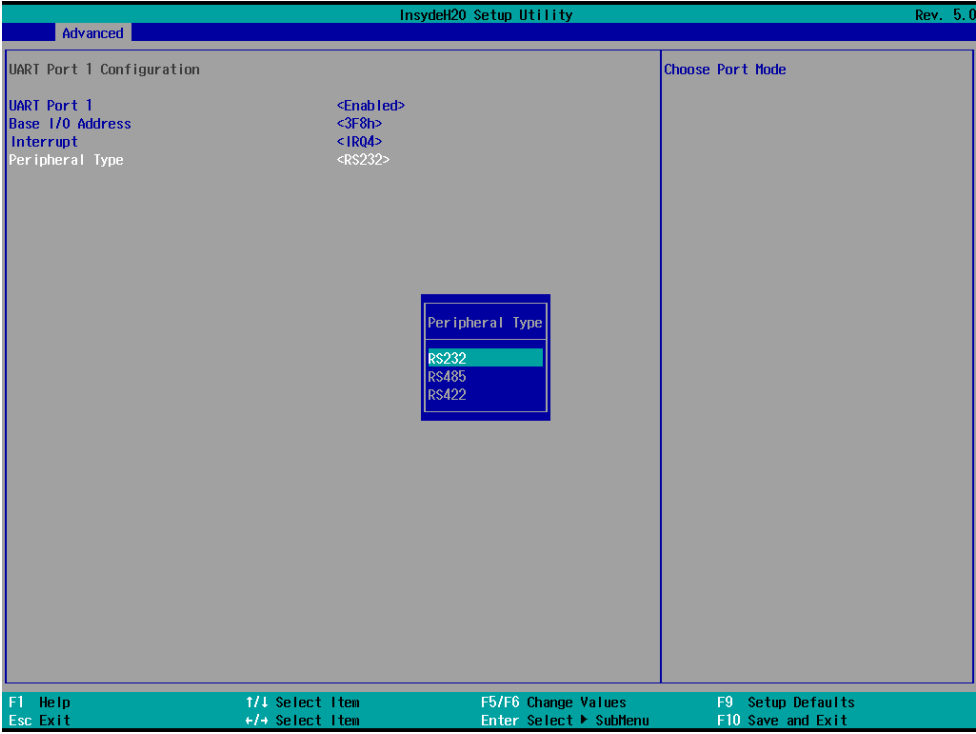


Base I/O Address, default is 3F8h.



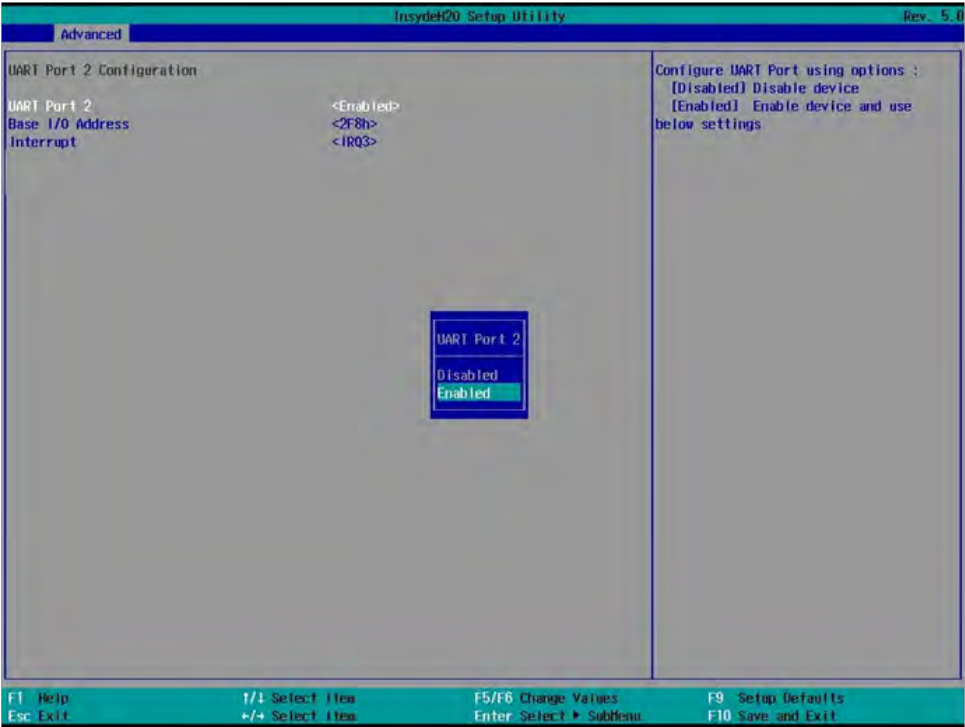
Interrupt, default is IRQ4.



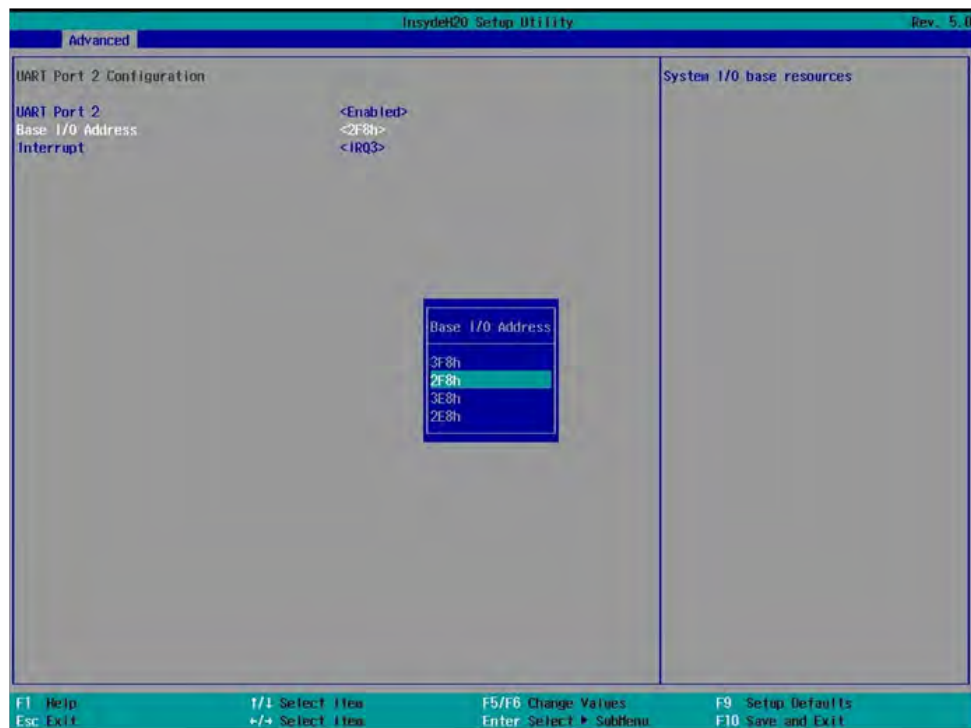


Peripheral, to select the Serial port to RS232 / RS422 / RS485, default is RS232.

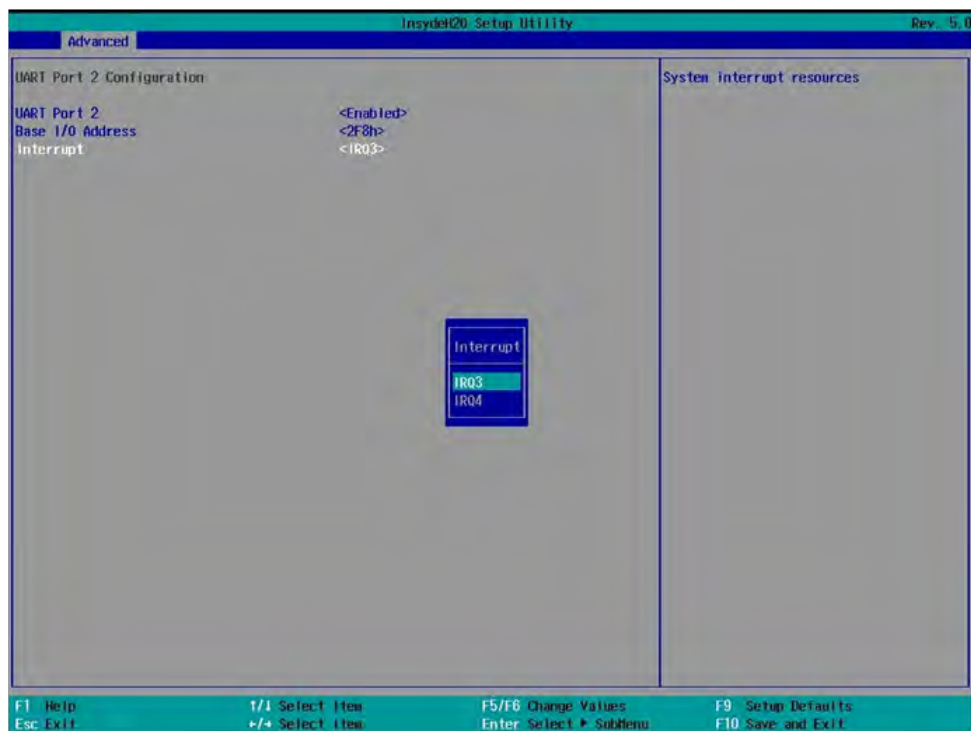
### 4-6-3-2 ► UART Port 2 Configuration



To Enable Serial port or not, default is Enabled.

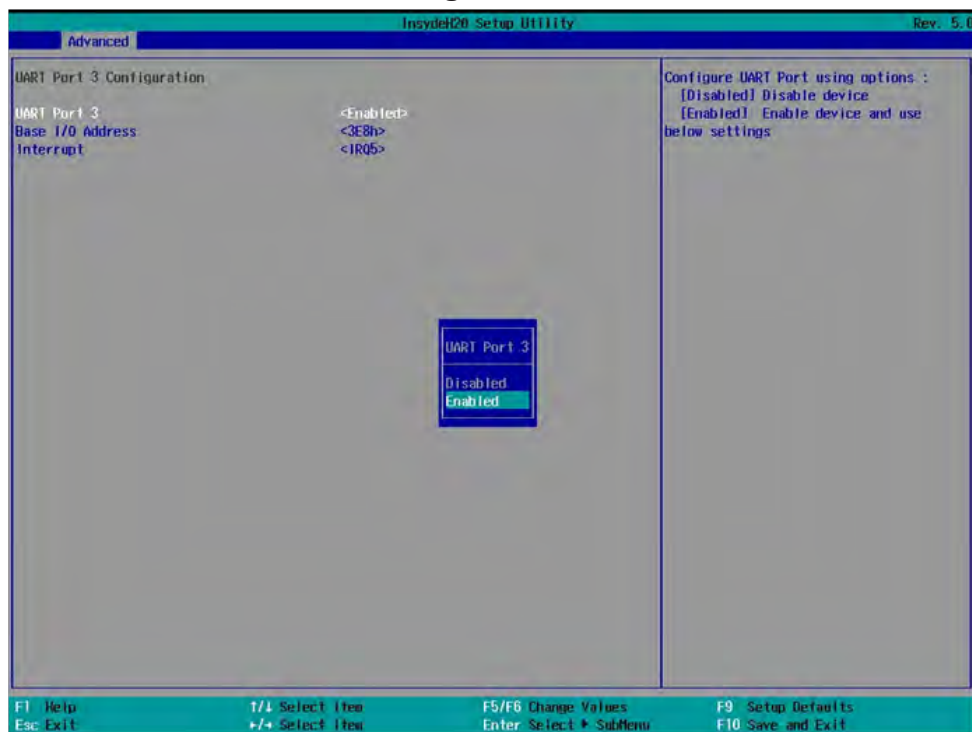


Base I/O Address, default is 2F8h.

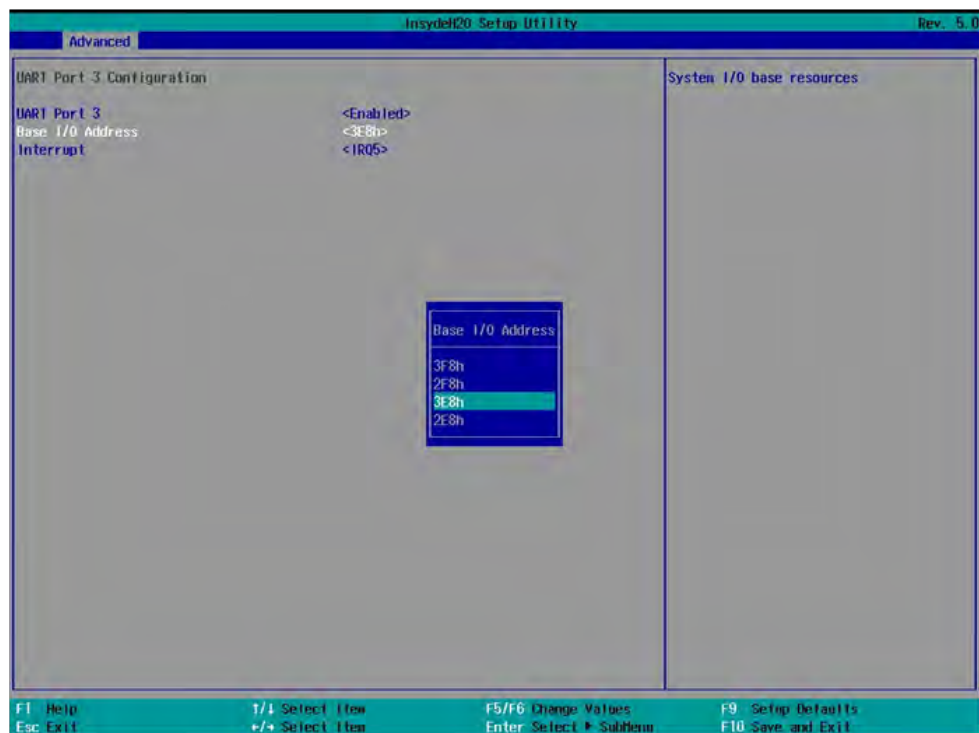


Interrupt, default is IRQ3.

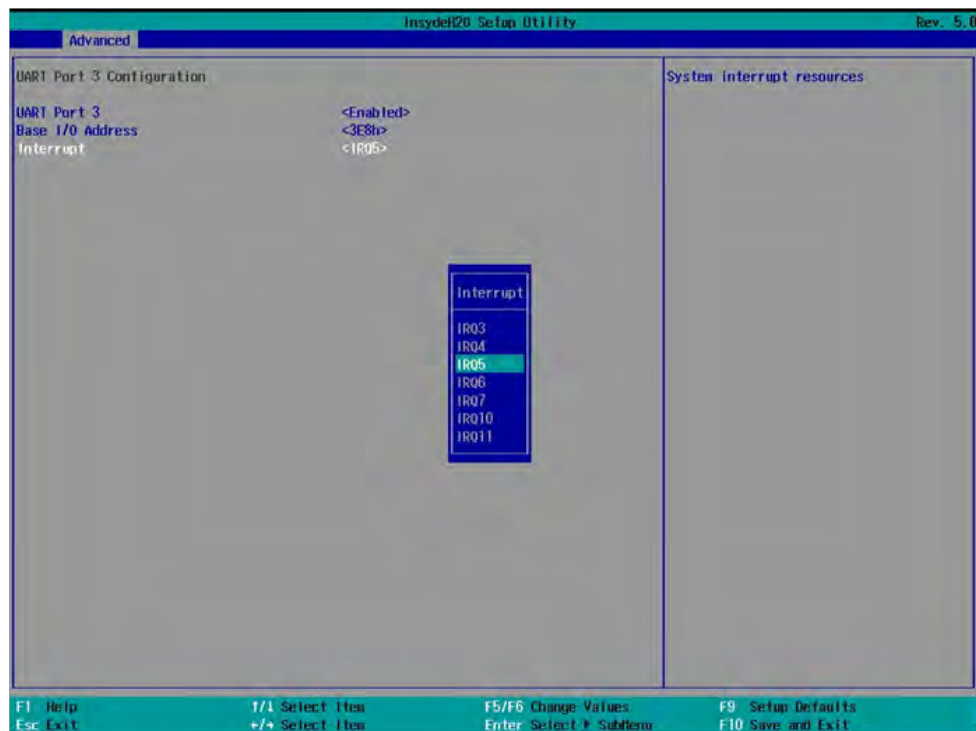
### 4-6-3-3 ► UART Port 3 Configuration



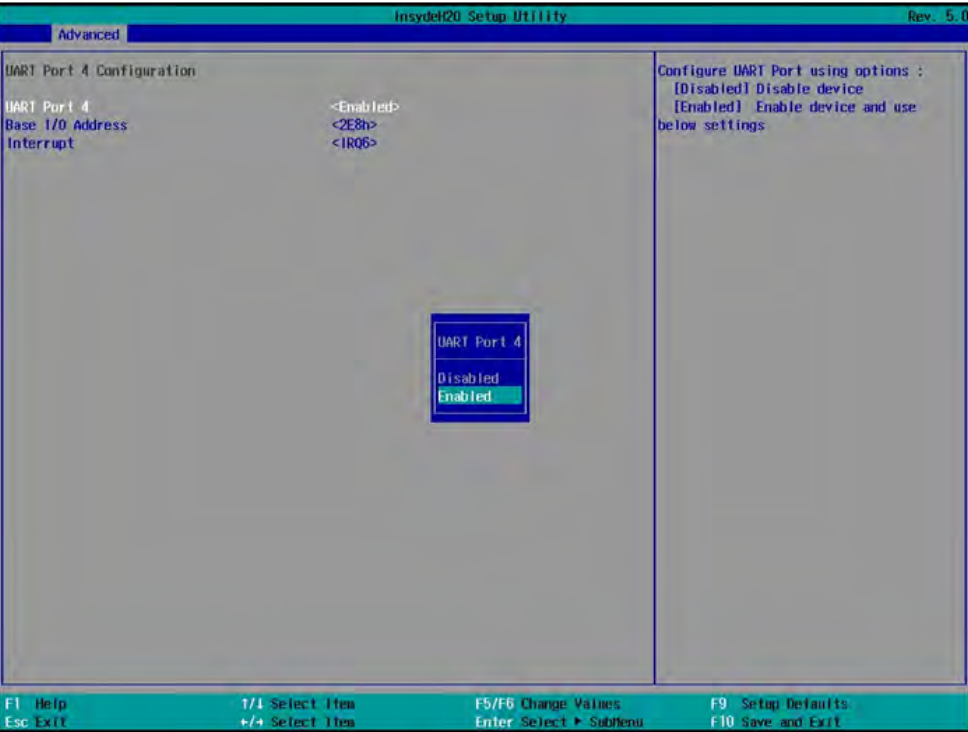
To Enable Serial port or not, default is Enabled.



Base I/O Address, default is 3E8h.

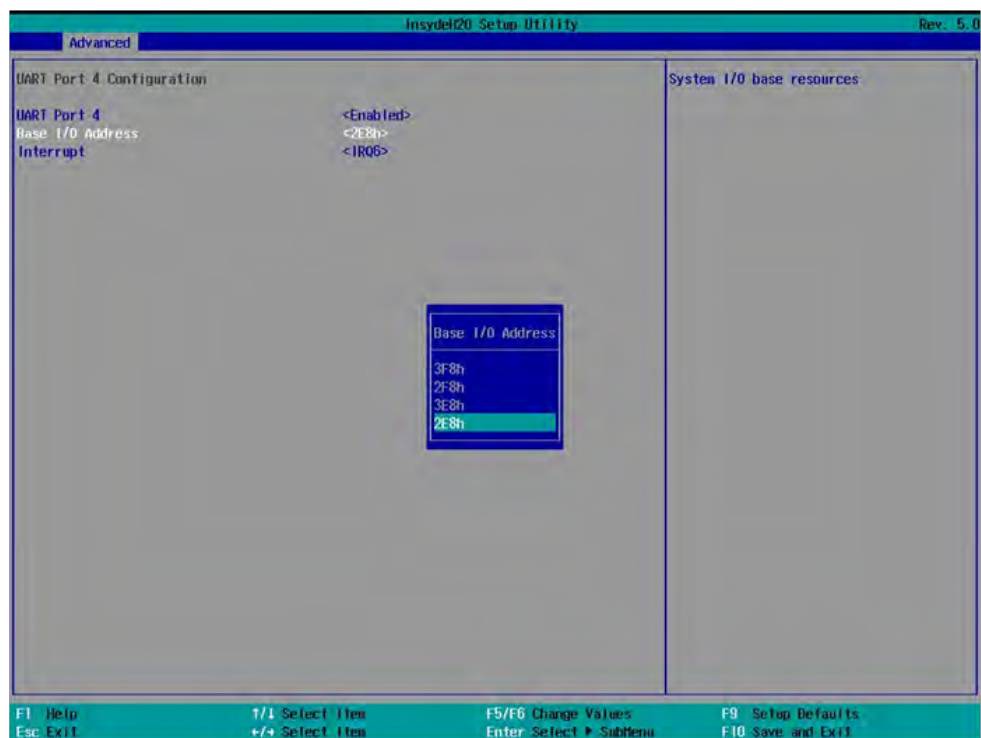


### 4-6-3-4 UART Port 4 Configuration

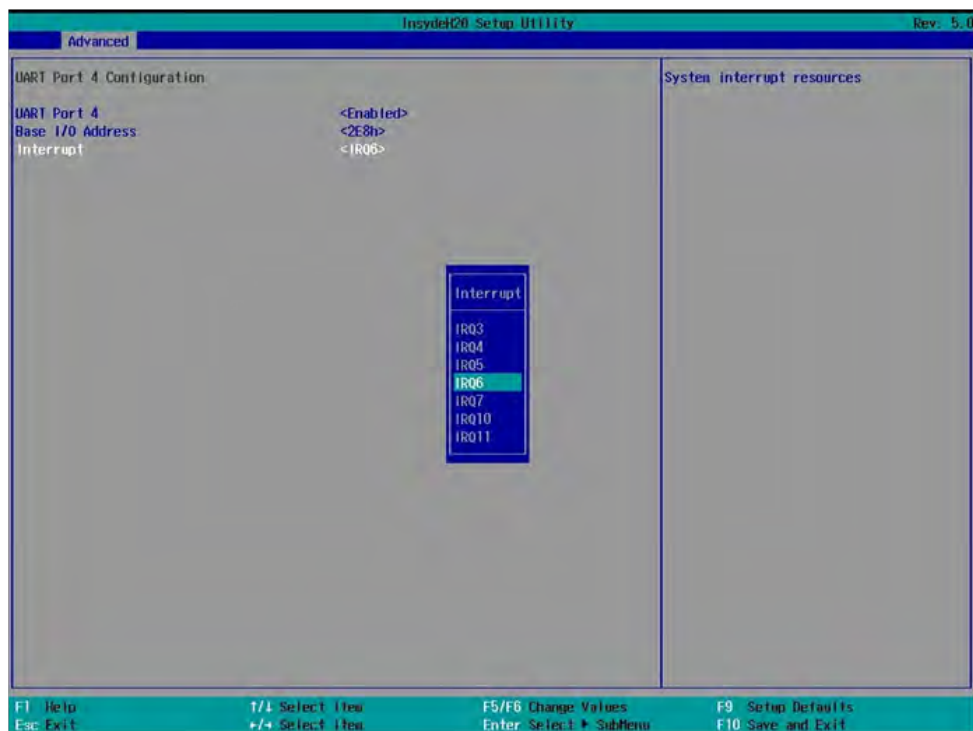


To Enable Serial port or not, default is Enabled.





Base I/O Address, default is 2F8h.



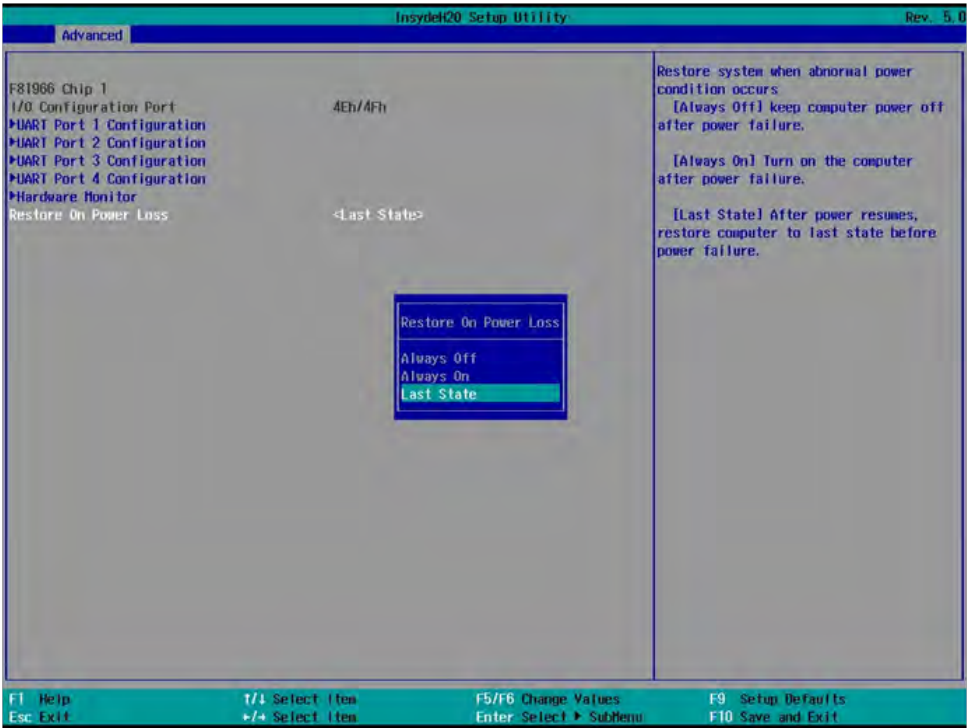
Interrupt, default is IRQ3.

### 4-6-3-5 ► Hardware Monitor



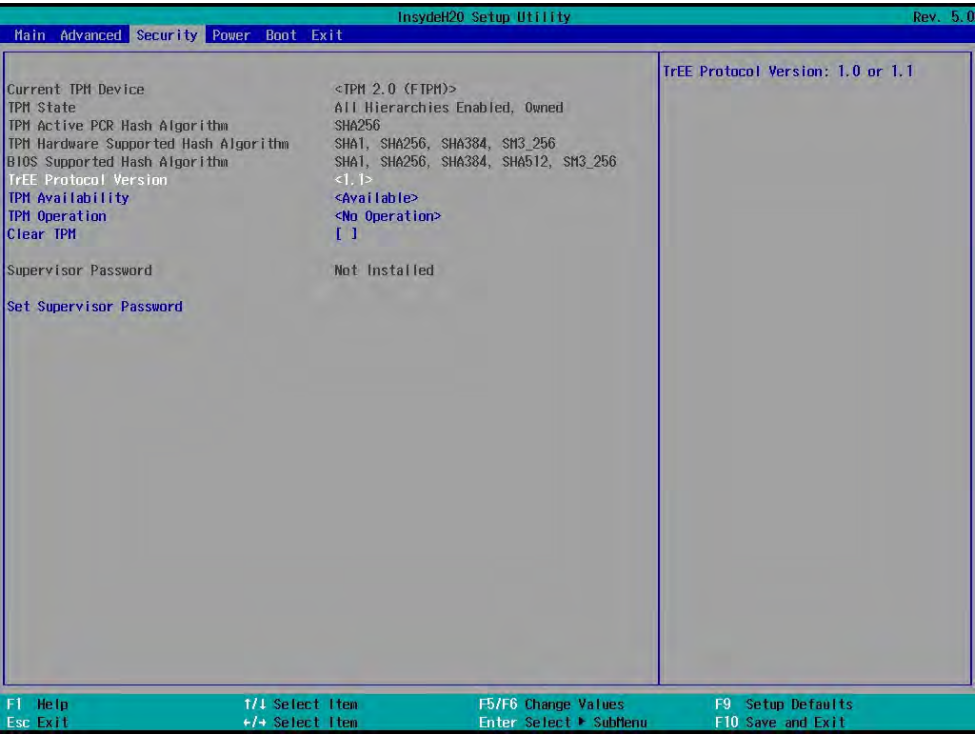
Press [Enter] to view PC health status.  
This section shows the status of your CPU, Fan, and overall system.  
This is only available when there is Hardware Monitor function onboard.

# 4-6-3-6 Restore On Power Loss



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

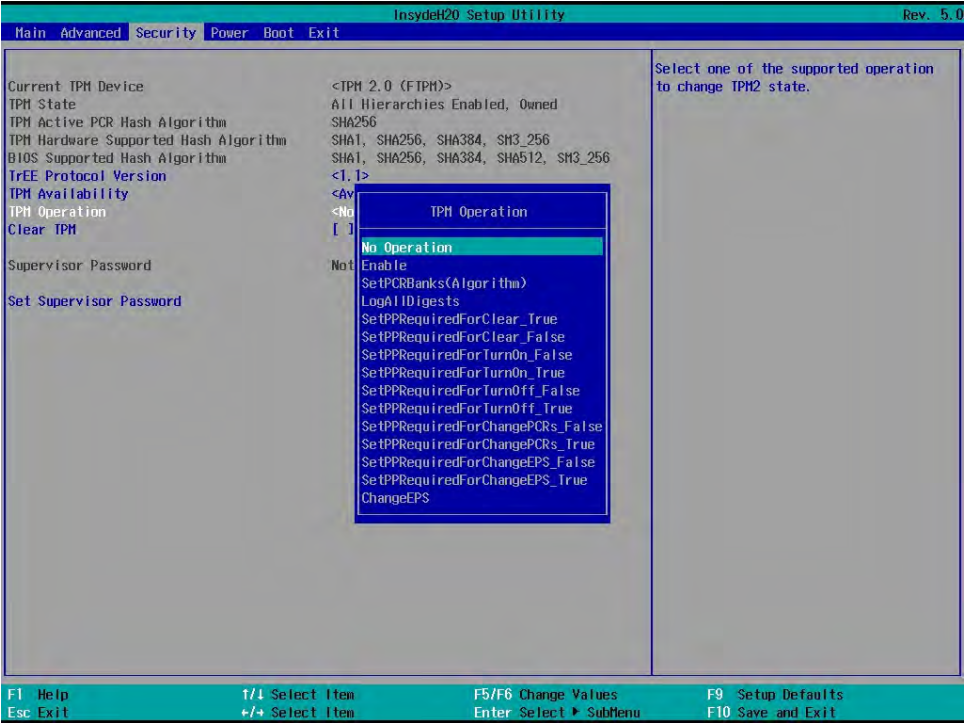
# 4-7 Security



**TrEE Protocol Version**  
There are 1.0 and 1.1 versions.

**TPM Availability**  
To select TPM available or hidden

**TPM Operation**

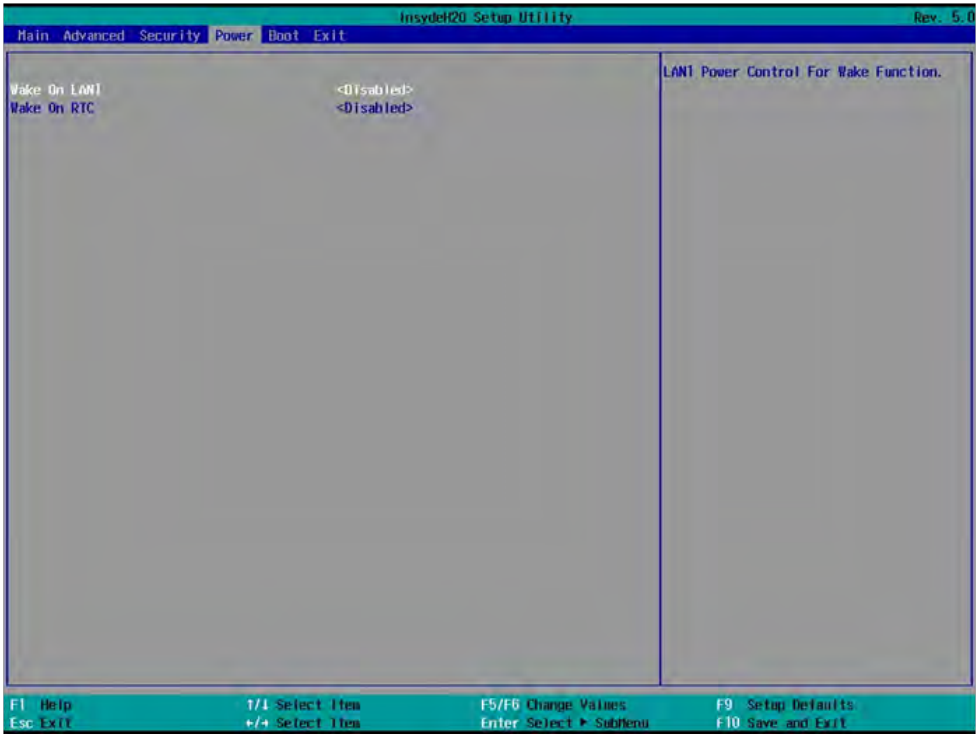


To select TPM operations  
**Set Supervisor Password**

InsydeH20 Setup Utility		Rev. 5.0								
<span style="margin-right: 10px;">Main</span> <span style="margin-right: 10px;">Advanced</span> <span style="margin-right: 10px; border-bottom: 1px solid white;">Security</span> <span style="margin-right: 10px;">Power</span> <span style="margin-right: 10px;">Boot</span> <span style="margin-right: 10px;">Exit</span>										
Current TPM Device TPM State TPM Active PCR Hash Algorithm TPM Hardware Supported Hash Algorithm BIOS Supported Hash Algorithm TrEE Protocol Version TPM Availability TPM Operation Clear TPM  Supervisor Password  Set Supervisor Password	<div style="border: 1px solid black; padding: 5px;"> <p>&lt;TPM 2.0 (fTPM)&gt;</p> <p>All Hierarchies Enabled, Owned</p> <p>SHA256</p> <p>SHA1, SHA256, SHA384, SM3_256</p> <p>SHA1, SHA256, SHA384, SHA512, SM3_256</p> <p>&lt;1.1&gt;</p> <p>&lt;Available&gt;</p> <p>&lt;No Operation&gt;</p> <p>[ ]</p> </div> <p>Not Installed</p>									
<div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: 80%;"> <p style="text-align: center; margin: 0;">Set Supervisor Password</p> <p style="margin: 5px 0;">Enter New Password: <span style="background-color: #008080; color: black; display: inline-block; width: 100px; height: 1.2em; vertical-align: middle;"></span></p> <p style="margin: 5px 0;">Enter New Password Again: <span style="background-color: #808080; color: black; display: inline-block; width: 100px; height: 1.2em; vertical-align: middle;"></span></p> </div>										
<table style="width: 100%; font-size: 0.9em;"> <tr> <td style="width: 25%;">F1 Help</td> <td style="width: 25%;">T/I Select Item</td> <td style="width: 25%;">F5/F6 Change Values</td> <td style="width: 25%;">F9 Setup Defaults</td> </tr> <tr> <td>Esc Exit</td> <td>+/- Select Item</td> <td>Enter Select ► Submenu</td> <td>F10 Save and Exit</td> </tr> </table>			F1 Help	T/I Select Item	F5/F6 Change Values	F9 Setup Defaults	Esc Exit	+/- Select Item	Enter Select ► Submenu	F10 Save and Exit
F1 Help	T/I Select Item	F5/F6 Change Values	F9 Setup Defaults							
Esc Exit	+/- Select Item	Enter Select ► Submenu	F10 Save and Exit							

To set up an Supervisor password

# 4-8 Power



## Wake On LAN1

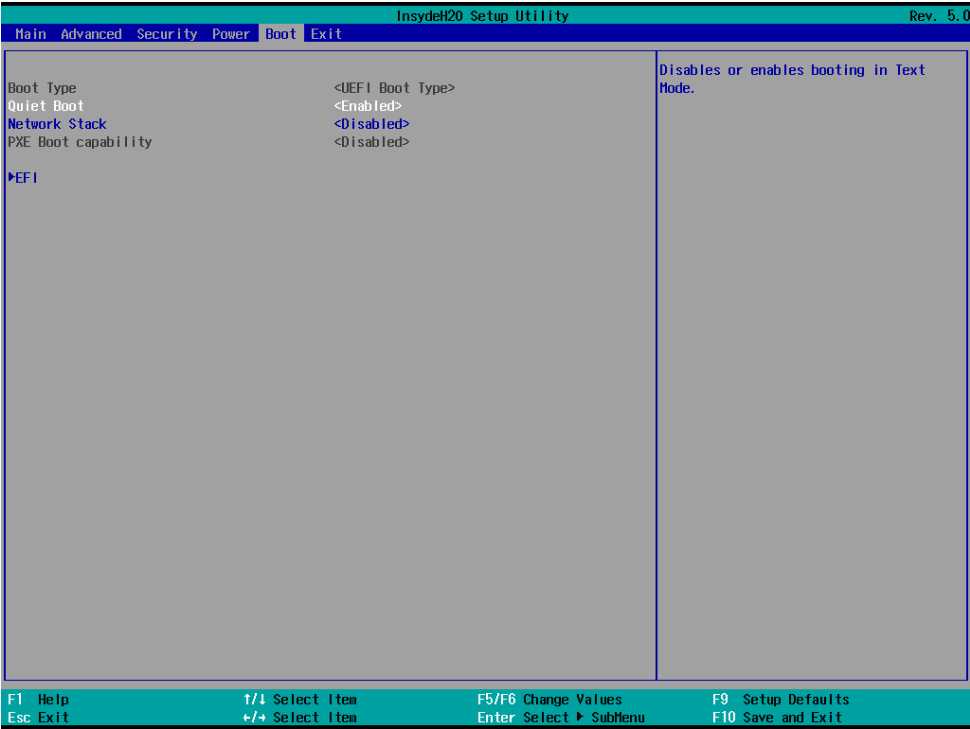
To select S3, S5 or S3 / S5 wake on LAN1, default is Disabled.

## Wake On RTC

The optional settings are: Disabled (default), By every day, By day of month.



# 4-9 Boot



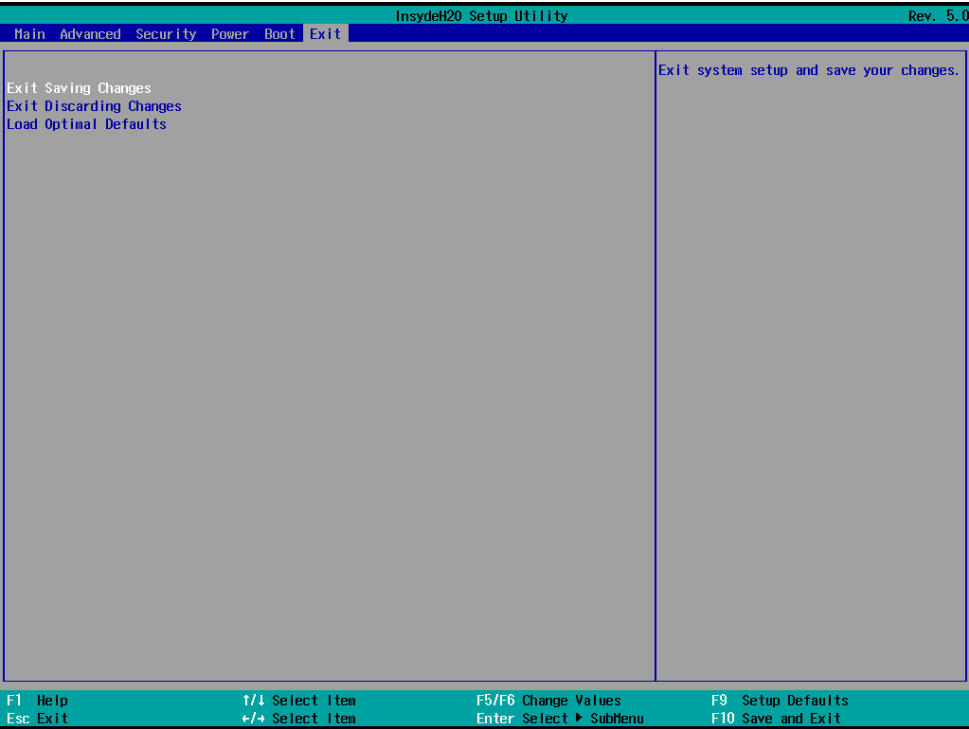
## Quiet Boot

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

## Network Stack

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

# 4-10 Save & Exit



**Exit Saving Changes**  
Save configuration and reset

**Exit Discarding Changes**  
Reset without saving the changes

**Load Optimal Defaults**  
To restore the optimal default for all the setup options

## 4-11 How to update Insyde BIOS

Under DOS Mode

STEP 1. Prepare a bootable disc.

(Storage device could be USB FDD or USB pen drive.)

STEP 2. Copy utility program to your bootable disc. You may download it from our website.

STEP 3. Copy the latest BIOS for your LEX motherboard from our website to your bootable disc.

STEP 4. (Here take 2I640HW as an example, please enter your motherboard's name)

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

X:\: H2OFFT-D.EXE 2I640HWA2.ROM -BIOS -ALL

2I640HWA2.ROM is the file name of the latest BIOS.

It may be 2I640HWA1.ROM or 2I640HWA2.ROM, etc.

Please leave one space between .ROM & -BIOS -ALL

By Bay Trail series mainboard, please type

X:\: H2OFFT-D.EXE 2I640HWA2.ROM -BIOS -ALL

-BIOS : Flash BIOS region

-ALL : Flash all

STEP 5. Press ENTER and the BIOS will be updated,  
Computer will restart automatically.

## 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 )