

2I110AW

Intel ® Tiger Lake-UP3 Core™ I
/ Celeron processor,
DDR4 LAN / HDMI / USB / M.2 / COM

All-In-One
11th gen. Intel Tiger Lake-U Core™ I / Celeron CPU
4 x HDMI, 2 x M.2, USB
3 x LAN, 2 x COM, 1 x Nano SIM
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**

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User Manual edition 0.1, NOV. 02. 2022

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.

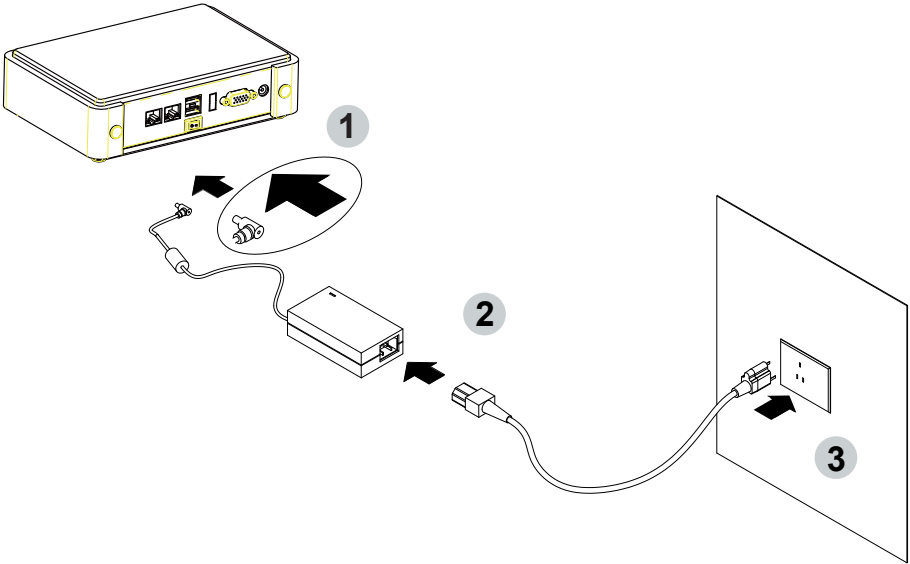
Remark 1:

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

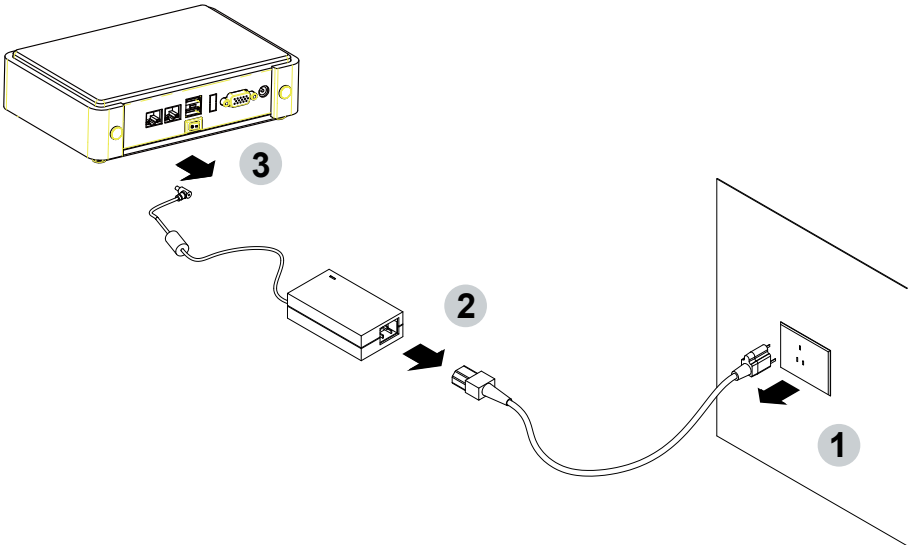
Moreover, erratic pull / push action might cause an unpredictable damage to the component & system unit.

Photo 1

Insert



Unplug



Chapter-1

General Information

The 2I110AW is an ultra compact (102 x 108 mm) SBC with 11th Gen. Intel® Tiger Lake UP3 i7 / i5 / i3 / Celeron processor, integrated 4 x GbE LAN, 6 x USB, 2 x COM Port and 4 HDMI supports 4K resolution display that offer the ideal platforms for high performance applications in public to provide more information to people, such as Station, Central Park, Digital signage, Show room information, Machine Vision, In-vehicle, Industry 4.0 and any compact high-performance Internet of Things (IoT) applications.

The 2I110AW supports high-speed data transfer interfaces such as PCIe gen3, USB 3.0, and SATA 6 Gb/s (SATA III), with one-channel DDR4 3200 MHz memory up to 32GB SODIMM slot and supports two serial ports RS232 / RS485 / RS422 jumper free auto switch by BIOS. It supports 3 ports of USB 3.0, 6 ports of USB 2.0. The expandable interfaces include 1 M.2 3042 B-key for PCIe x 2 and USB 3.0 / 2.0 & 1 M.2 2242 M-key for PCIe x 4 for high speed NVMe storage, mSATA (auto-detect).

1-1 Major Feature

1. Intel® Core i3-1115GRE Processor 2.2GHz / 3.9GHz (Quad core),
Intel® Core i7-1185GRE Processor 1.8GHz / 4.4GHz (Quad core)
2. Intel® UHD Graphics for 11th Gen Intel® Processors, Intel® Iris® Xe Graphics
3. DDR4 SODIMM slot x 1, up to 32GB
4. Support 3 x 2.5Gbps Intel LAN ports.
5. Support 2 x RS232 selectable to RS485 / RS422 by BIOS
6. 2 x USB 3.0 and 4 x USB 2.0
7. Support extended 1 x M.2 3042 B-Key for PCIe x 2 and USB 3.0 / 2.0 interface,
1 x M.2 2242 M Key for PCIe x 4 / mSATA (auto-detect).
8. Support 1 SATA port
9. Hardware digital Input & Output, 4 x DI / 4 x DO, Hardware Watch Dog Timer,
0~255 sec programmable

1-2 Specification

1. **SOC:** Intel® Core i3-1115GRE Processor 2.2GHz / 3.9GHz (Quad core),
Intel® Core i7-1185GRE Processor 1.8GHz / 4.4GHz (Quad core)
2. **Memory:** DDR4 SODIMM slot x 1, up to 32GB
3. **Graphics:** Intel® UHD Graphics for 11th Gen Intel® Processors,
Intel® Iris® Xe Graphics
4. **SATA:** Integrated Serial ATA Host Controller 1 SATA port,
SATA Gen3 Data transfer rates up to 6.0 Gb/s (600 MB/s).
5. **LAN:** 3 Intel I225 LAN chipset with 2.5Gbps for PCIe x 1 V2.1
6. **I/O Chip:** Switch chipset for 2 ports RS232 / RS422 / RS485 selected by BIOS
7. **USB:** 2 type A USB 3.0, 4 USB 2.0 (internal)
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 M.2 3042 B-Key for PCIe x 2 and USB 3.0 / 2.0 interface,
one M.2 2242 M-Key for PCIe x 4 / mSATA (auto-detect).
10. **BIOS:** AMI UEFI BIOS
11. **Dimension:** 102 x 108 mm
12. **Power:** On board DC +9~+36V

1-3 Installing the SO-DIMM

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

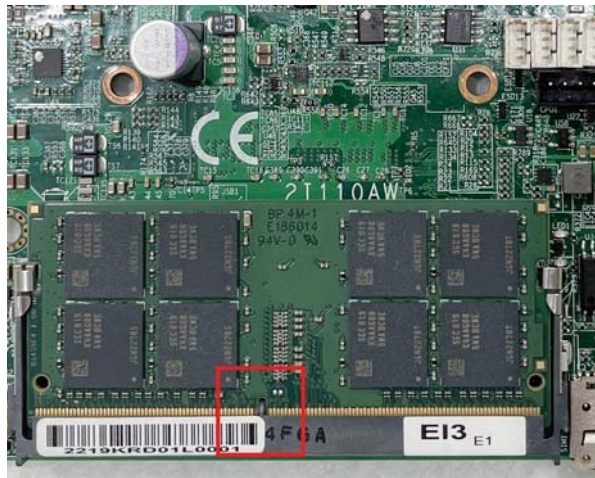


2. Press the SO-DIMM into the connector until you hear a click.

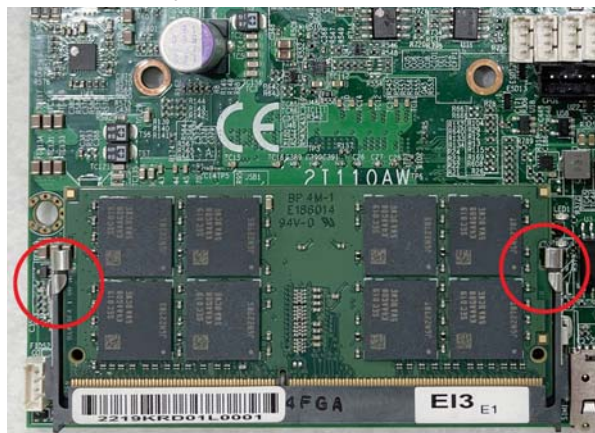


Notices:

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.



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

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

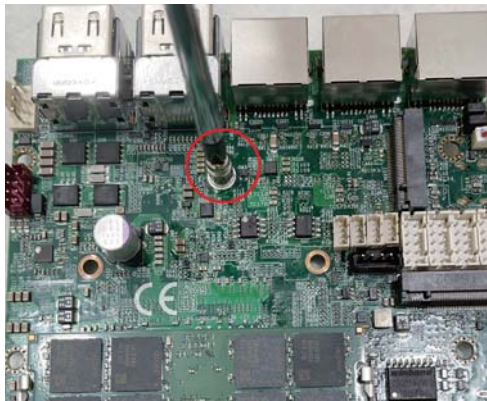


2. Lift the SO-DIMM out of its connector carefully.



1-4 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

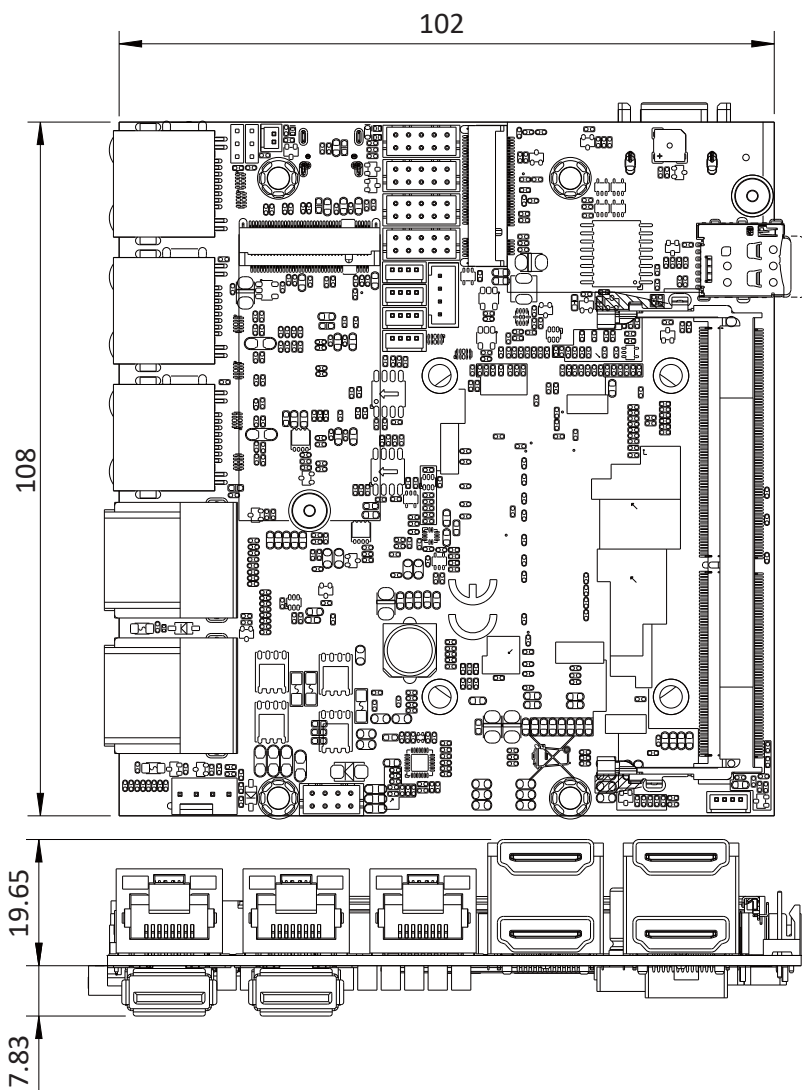


3. Gently push down the Mini Card and screw the screw back.



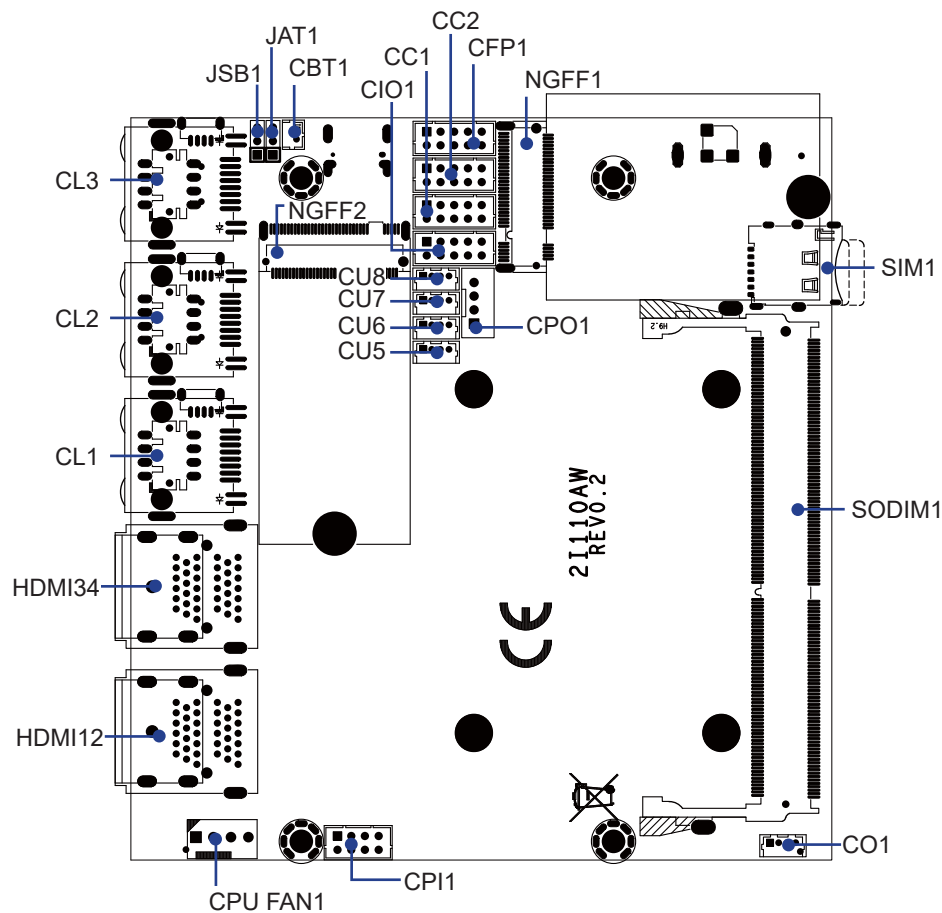
Chapter-2

2-1 Dimension-2I110AW

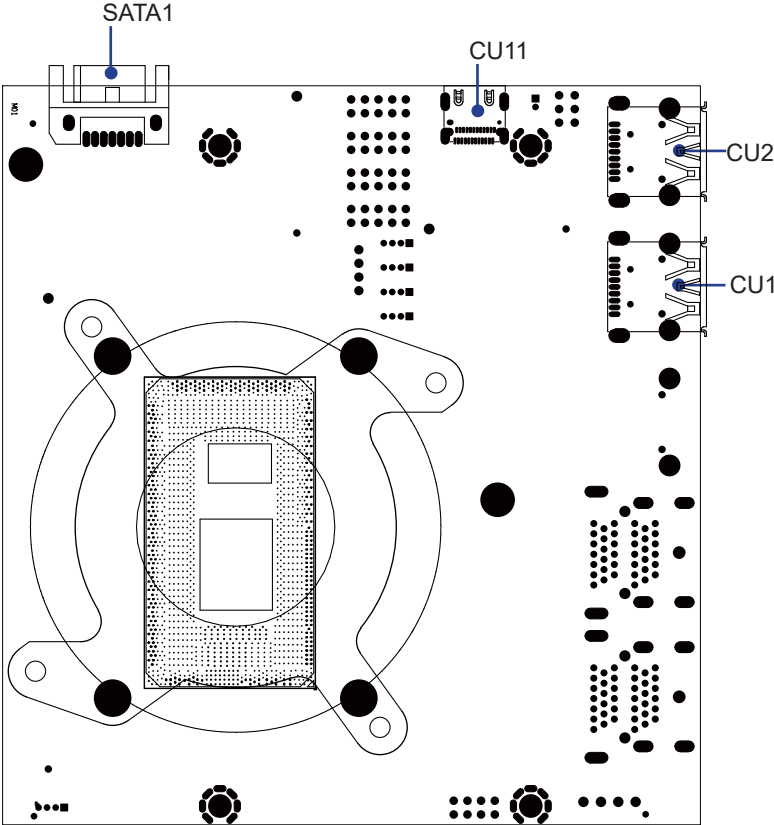


2-2 Layout-2I110AW-Connector and Jumper

TOP

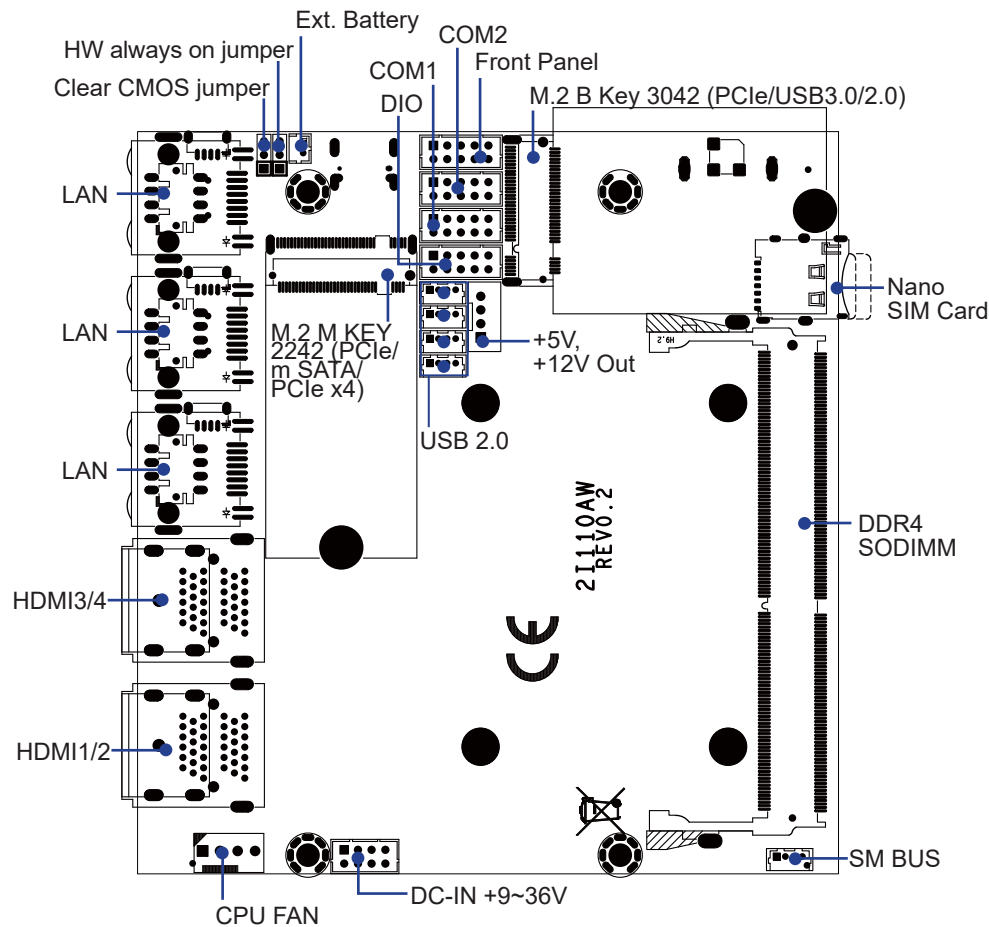


2-2-1 Layout-2I110AW-Connector and Jumper Bottom
BOT



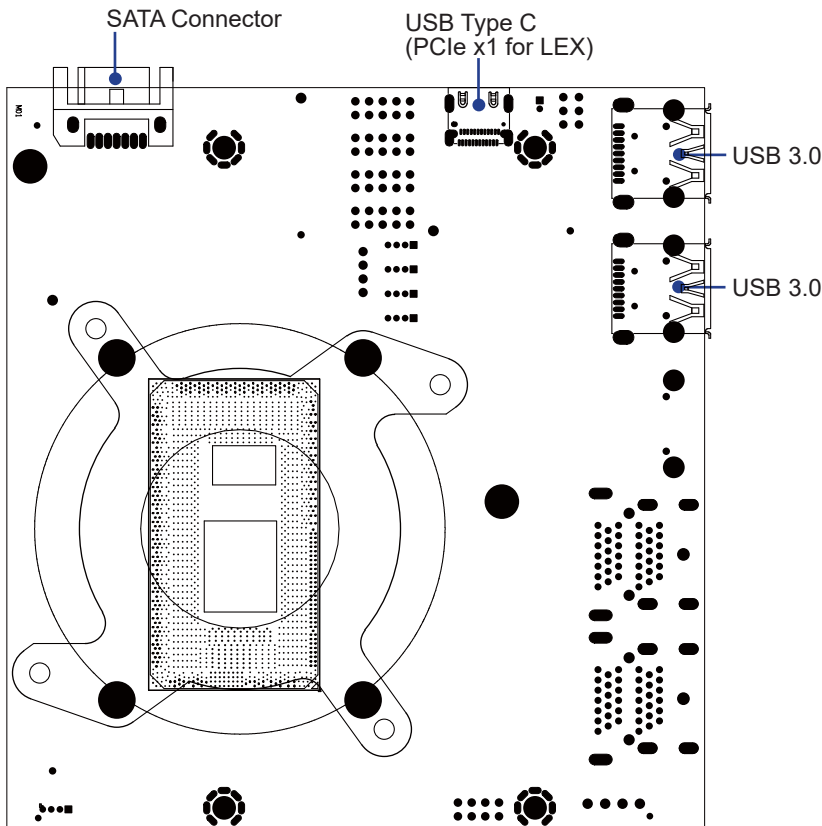
2-3 Layout-2I110AW-Function MAP

TOP



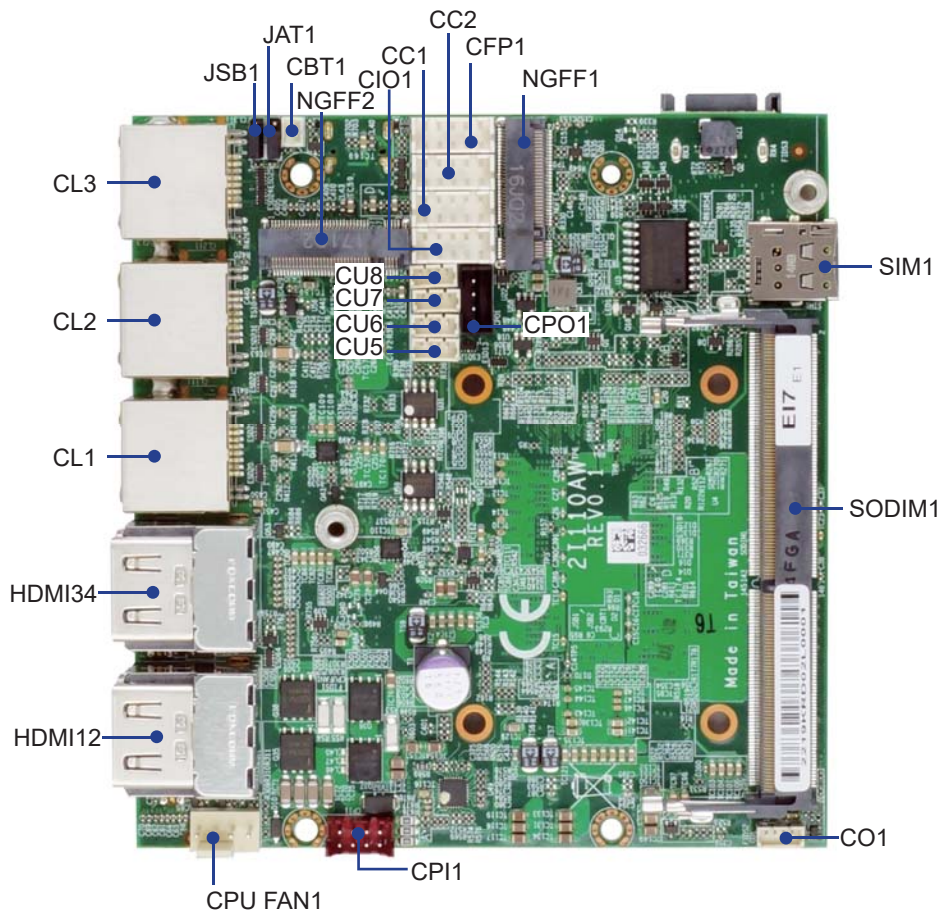
2-3-1 Layout-2I110AW-Function MAP

BOT



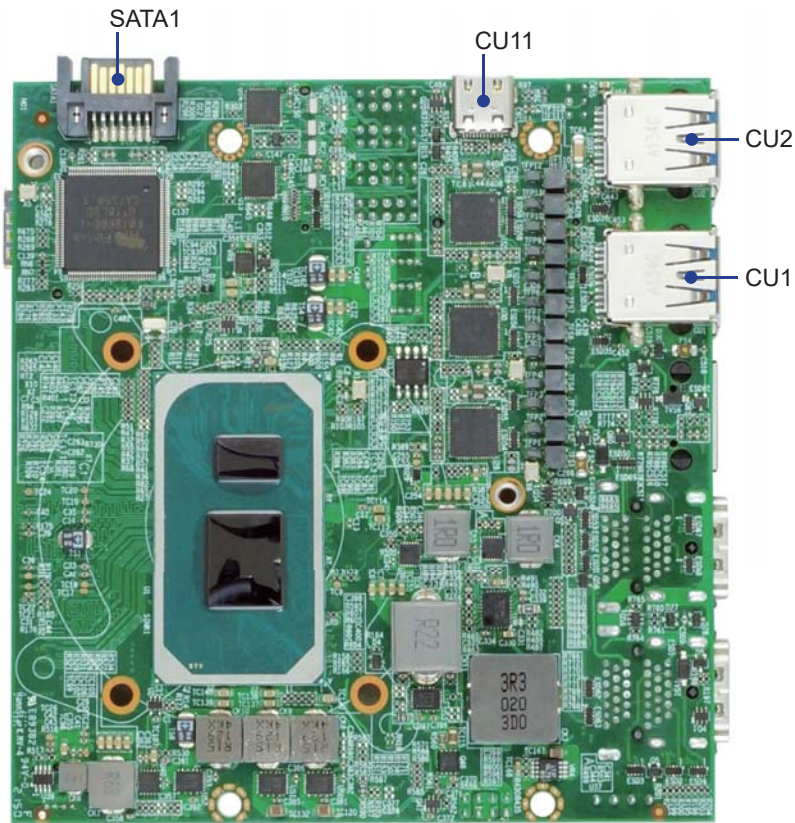
2-4 Diagram- 2I110AW

TOP

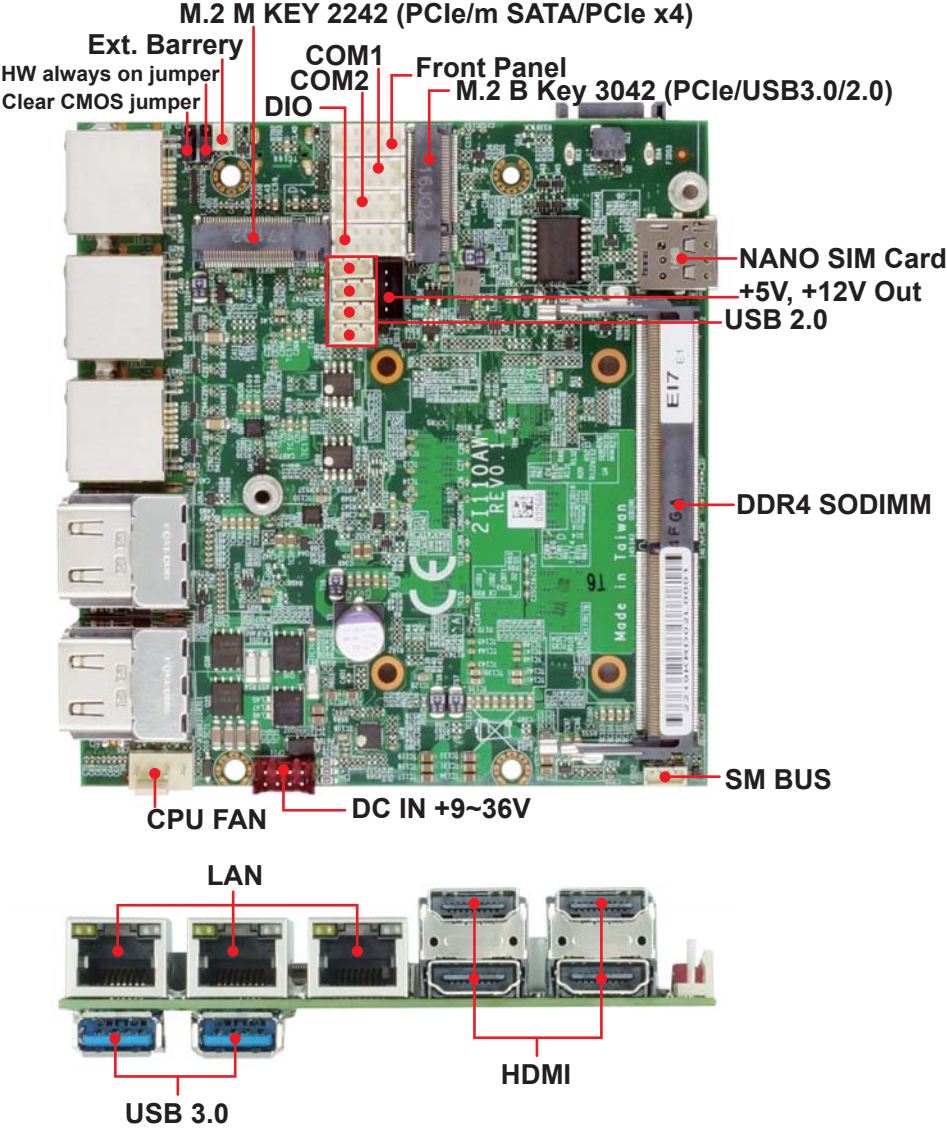


2-4-1 Diagram- 2I110AW

BOT



2-5 Function MAP- 2I110AW



2-6 List of Jumpers

JSB1: CMOS DATA Clear

JAT1: HW system always on

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.

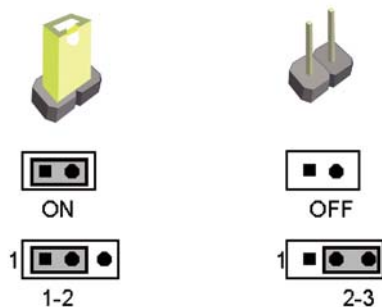


Figure 2.2

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.

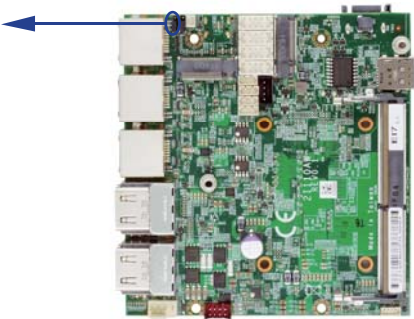
To clear the CMOS, follow the procedures below:

- 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 / ME data clear

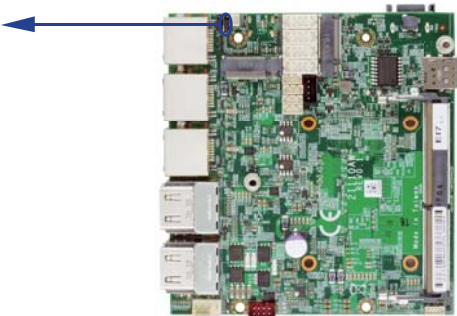
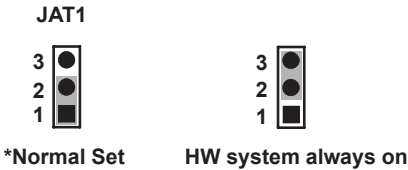
Note: Do not clear CMOS unless

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



2-9 JAT1: HW system always on

JAT1	DESCRIPTION
*1-2	Normal Set
2-3	HW system always on



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 IN 2x4 pin (2.0mm) Red wafer
CBT1:	COMS battery 1x2 pin (1.25mm) wafer
CC1~CC2:	COM 2x5 pin (2.0mm) wafer
CFP1:	Front Panel connector 2x5 pin (2.0mm) wafer
CIO1:	4DI / 4DO 2x5 pin (2.0mm) wafer
CPU FAN1:	CPU Fan 1x4 pin (2.54mm) wafer
CU1~CU2:	USB 3.0 Type A connector
CU5~CU8:	USB 2.0 port 1x4 pin (1.25mm) wafer
CL1~CL3:	LAN RJ45 Connector
CO1:	SMBus 1x4 pin (1.25mm) wafer
CPO1:	+12V / +5V power output 4 pin (2.0mm) Black wafer
SATA1:	SATA connector 7pin
SODIMM1:	DDR4 Channel A SODIMM H: 9.2mm
NGFF1:	M.2 NGFF B key sockets 75pin H: 8.5mm
NGFF2:	M.2 NGFF M key sockets 75pin H: 8.5mm
SIM1:	Nano SIM card socket
CU11:	USB Type C connector (PCIe x1 signal for LEX)
HDMI12:	HDMI1 / 2 Connector
HDMI34:	HDMI3 / 4 Connector

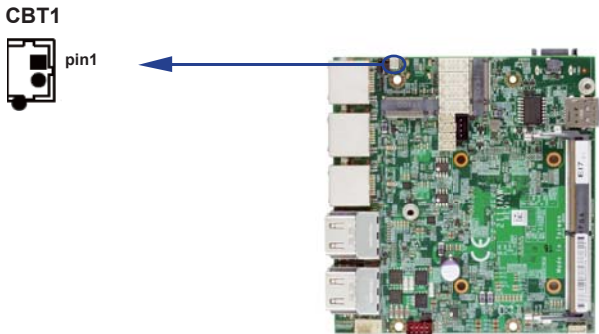
3-2 CMOS battery connector

• CBT1: CMOS Battery 1x2 pin (1.25mm) Wafer.

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 COM interface

CC1 / CC2: COM 2x5 pin (2.0mm) Wafer

• (RS232 Mode)

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

• (RS485 Mode)

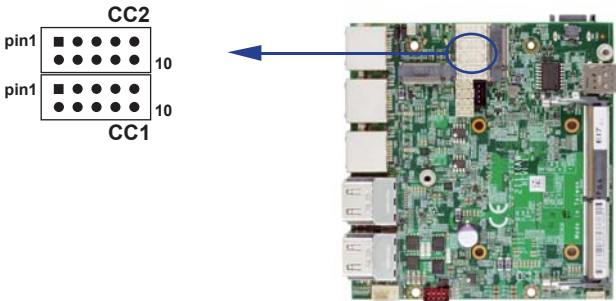
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Data-	2	Data+
3	NC	4	NC
5	GND	6	NC
7	NC	8	NC
9	NC	10	+5V

• (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:

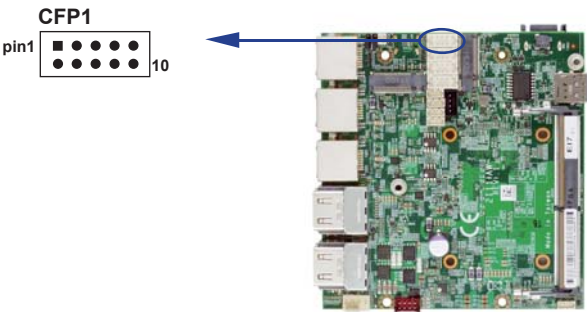
1. Pin 9 RI and Voltage setting only for COM 1/2 ports, is used BOM control.
2. Default support RS232 / RS422 / RS485 by BIOS selected, default set RS232.



3-4 Front Panel Pin Header

• CFP1: Front Panel connector 2x5 pin (2.0mm) Wafer

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

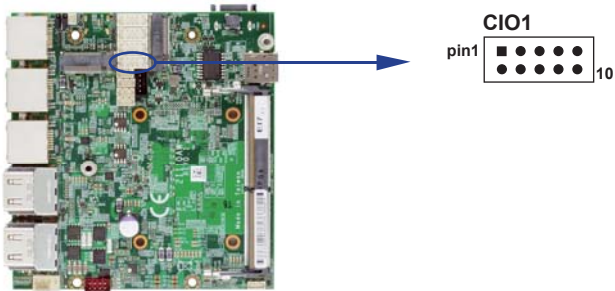


3-5 DIO Interface

• **CIO1: 4DI / 4DO 2x5 pin (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

Note: 1. 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.

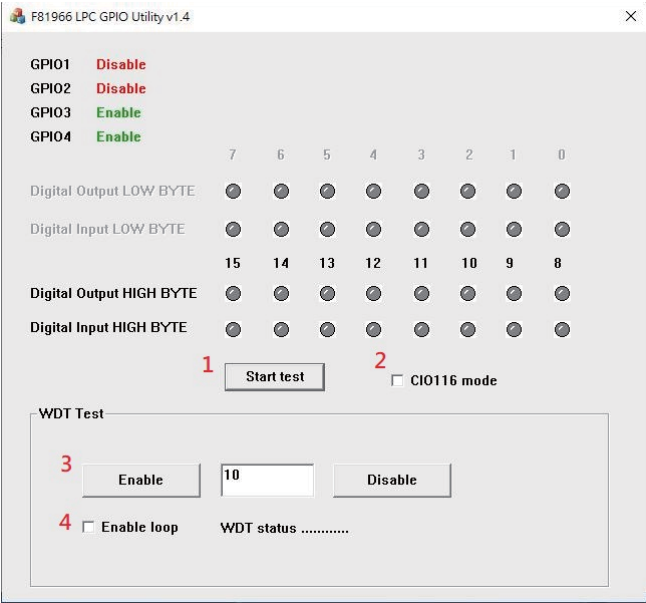
3-5-1 IO Device: F81966 DIO under Windows

The Sample code source you can download from

http://tprd.info/lexwiki/index.php/IO_Device:F81966_LPC_DIO_under_Windows

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: 2I110AW
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();
```

3-5-2 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

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: 2I110AW
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();
```

3-6 USB Interface

• CU1~CU2: USB 3.0 Type A Connector

PIN NO.	Description	PIN NO.	Description
1	VBUS	5	SS_RX-
2	D-	6	SS_RX+
3	D+	7	GND
4	GND	8	SS_TX-
		9	SS_TX+

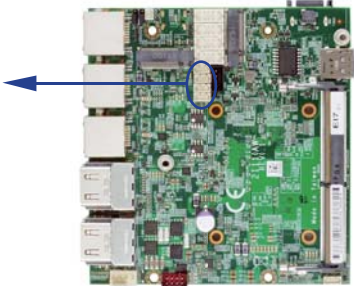
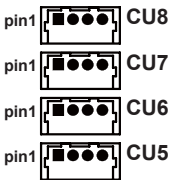
Note:

- 1. The power supply 0.9A for each USB 3.0 respect specification.
- 2. CU1, CU2 support wake up for option.



• CU5~CU8: USB 2.0 port 1x4 pin (1.25mm) Wafer

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



3-7 LAN Interface

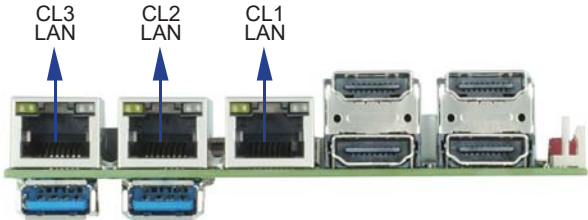
• **CL1 / CL2 / CL3: LAN RJ45 Connector**

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

• **LAN LED**

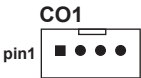
Speed	10Mbps			100Mbps		
Indicate	Back Side		Front Side	Back Side		Front Side
	Link Led	ACT Led	ACT Led	Link Led	ACT Led	ACT Led
LAN light	X	Orange	Orange	X	Orange	Orange

Speed	1000Mbps			2500Mbps		
Indicate	Back Side		Front Side	Back Side		Front Side
	Link Led	ACT Led	ACT Led	Link Led	ACT Led	ACT Led
LAN light	Green	Orange	Orange	Red	Orange	Orange



3-8 CO1: SMBus 1x4 pin (1.25mm) Wafer

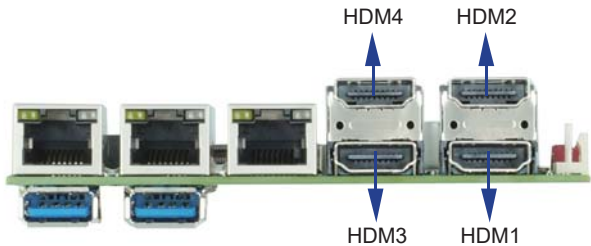
PIN NO.	Description
1	+3.3V
2	GND
3	SMBus Clock
4	SMBus DATA



3-9 Display Interface

• HDMI12 / HDMI34: HDMI Type A Connector

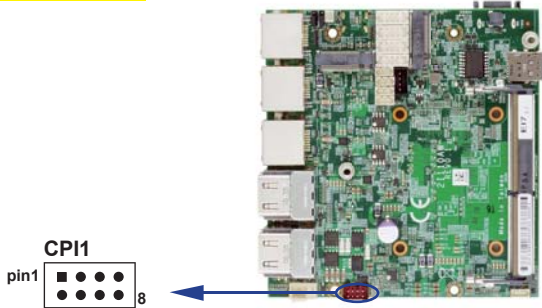
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TMDS DATA2+	2	GND
3	TMDS DATA2-	4	TMDS DATA1+
5	GND	6	TMDS DATA1-
7	TMDS DATA0+	8	GND
9	TMDS DATA0-	10	TMDS CLK+
11	GND	12	TMDS CLK-
13	NC	14	NC
15	DDC CLOCK	16	DDC DATA
17	GND	18	+5V
19	H.P. Detect		



3-10 CPI1: DC Power input (2x4 pin 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

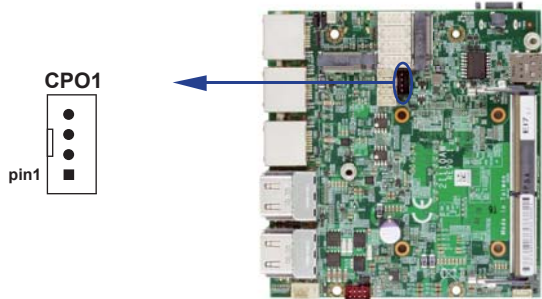
Note: 1. Very important check DC-in Voltage.



3-11 CPO1: DC +5 / +12V output 1x4 pin (2.0mm) Black Wafer

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

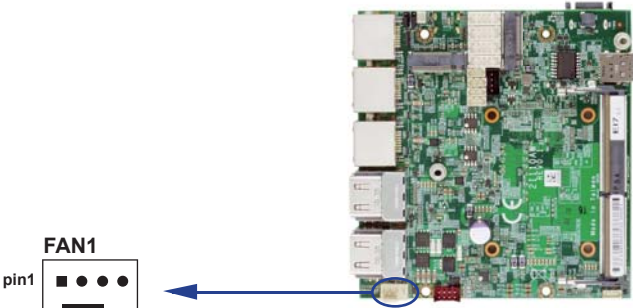
Note: Attention! Check Device Power in spec



3-12 CPU FAN1: CPU Fan 1x4 pin (2.54mm) Wafer (option)

PIN NO.	DESCRIPTION
1	GND
2	+12V
3	CPU FAN-IN
4	CPU FAN-OUT

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

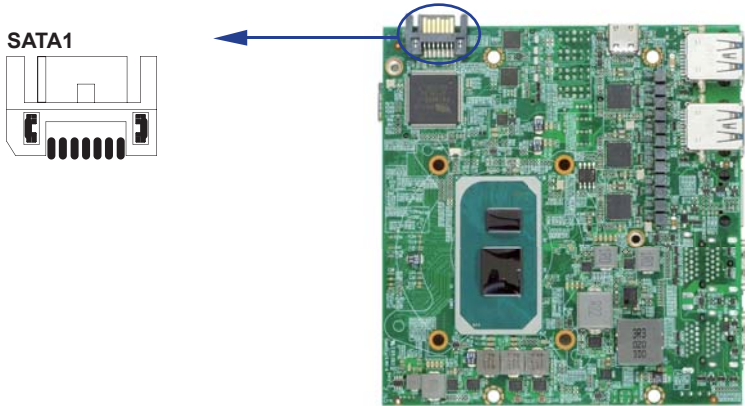


3-13 SATA Interface

• **SATA1: 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

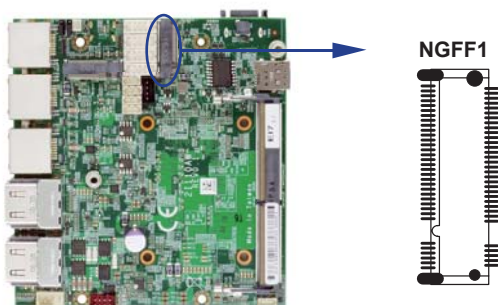


3-14 NGFF1 M.2 NGFF card B key sockets 75 pin

• 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_P4_DP	8	W_DISABLE_1_N
9	USB2_P4_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	NC
41	M2_PERn0	40	NC
43	M2_PERp0	42	NC
45	GND	44	NC
47	M2_PETn0	46	NC
49	M2_PETp0	48	NC
51	GND	50	M2_PRST_N
53	REFCLK_N	52	SRCCLKREQ_N
55	REFCLK_P	54	NC
57	GND	56	NC
59	NC	58	NC
61	NC	60	NC

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
63	NC	62	NC
65	NC	64	NC
67	MD_RESET_N	66	SIM_DET
69	NC	68	NC
71	GND	70	+3.3V
73	GND	72	+3.3V
75	CFG2 power select	74	+3.3V



3-15 NGFF2 M.2 NGFF card M key sockets 75 pin

• NGFF2: size 2242 (H=8.5)

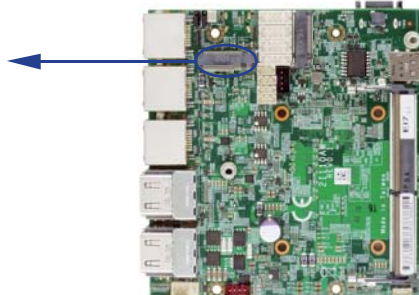
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+3.3V
3	GND	4	+3.3V
5	PCIE4_Rn3	6	NC
7	PCIE4_Rp3	8	NC
9	GND	10	M2_LED_N
11	PCIE4_Tn3	12	+3.3V
13	PCIE4_Tp3	14	+3.3V
15	GND	16	+3.3V
17	PCIE4_Rn2	18	+3.3V
19	PCIE4_Rp2	20	NC
21	GND	22	NC
23	PCIE4_Tn2	24	NC
25	PCIE4_Tp2	26	NC
27	GND	28	NC
29	PCIE4_Rn1	30	NC
31	PCIE4_Rp1	32	NC
33	GND	34	NC
35	PCIE4_Tn1	36	NC
37	PCIE4_Tp1	38	NC
39	GND	40	NC
41	PCIE4_Rn0_MSRp	42	NC
43	PCIE4_Rp0_MSRn	44	NC
45	GND	46	NC
47	PCIE4_Tn0_MSTn	48	NC
49	PCIE4_Tp0_MSTp	50	M2_PRST_N
51	GND	52	SRCCCLKREQ_N
53	CLK_SRC0_DN	54	NC

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
55	CLK_SRC0_DP	56	NC
57	GND	58	NC
M KEY			
67	NC	68	NC
69	PCIe_SATA#_DET	70	+3.3V
71	GND	72	+3.3V
73	GND	74	+3.3V
75	GND		

Note:

1. NGFF2 support mSATA / PCIe Auto detect.
2. NGFF2 support PCIe x4 GEN4 NVMe device.

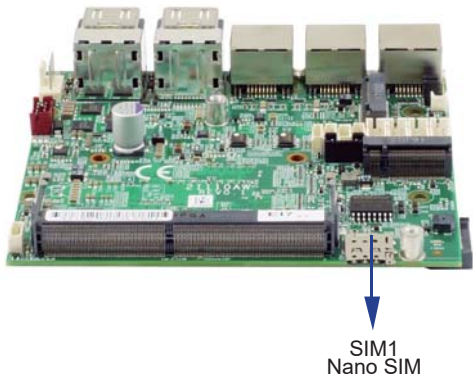
NGFF2



3-16 SIM1: Nano SIM card socket

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

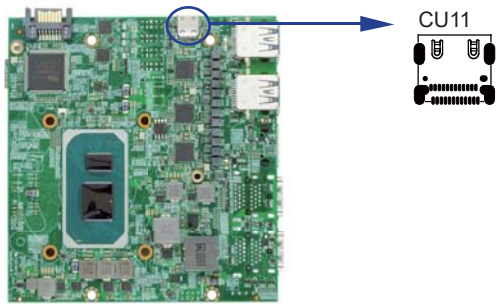
Note: 1. NGFF1 Pin 30, 32, 34, 36, 66 for SIM card reader use.



3-17 CU11: USB Type C 24pin connector (PCIe base for LEX use)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
A1	GND	B12	GND
A2	PCIE3_P1_TX_DP	B11	NC
A3	PCIE3_P1_TX_DN	B10	NC
A4	+3.3V	B9	+3.3V
A5	BUF_PLT_RST_N	B8	SMB_DATA
A6	CLK_SRC6_DP	B7	NC
A7	CLK_SRC6_DN	B6	NC
A8	NC	B5	SMB_CLK
A9	+3.3V	B4	+3.3V
A10	PCIE3_P1_RX_DN	B3	NC
A11	PCIE3_P1_RX_DP	B2	NC
A12	GND	B1	GND

Note: 1. Only support PCIe x1 interface, and use LEX module like CL225.



3-18 Connector wafer of Compatible Brand and part number list

Location	CKTS	PITCH	Brand Name	Mating connector	Cable housing
CC1~CC2	2x5 10Pin	2.0mm	JST	B10B-PHDSS	PHDR-10VS
CFP1	2x5 10Pin	2.0mm	JST	B10B-PHDSS	PHDR-10VS
CIO1	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
CU5~CU8	1x4 4Pin	1.25mm	MOLEX	53047-0410	51021-0400
CBT1	1x2 2Pin	1.25mm	MOLEX	53047-0210	51021-0200
EDP1	2x10 20Pin	1.25mm	HIROSE	DF13-20DS-1.25C	DF13-20DP-1.25V

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.

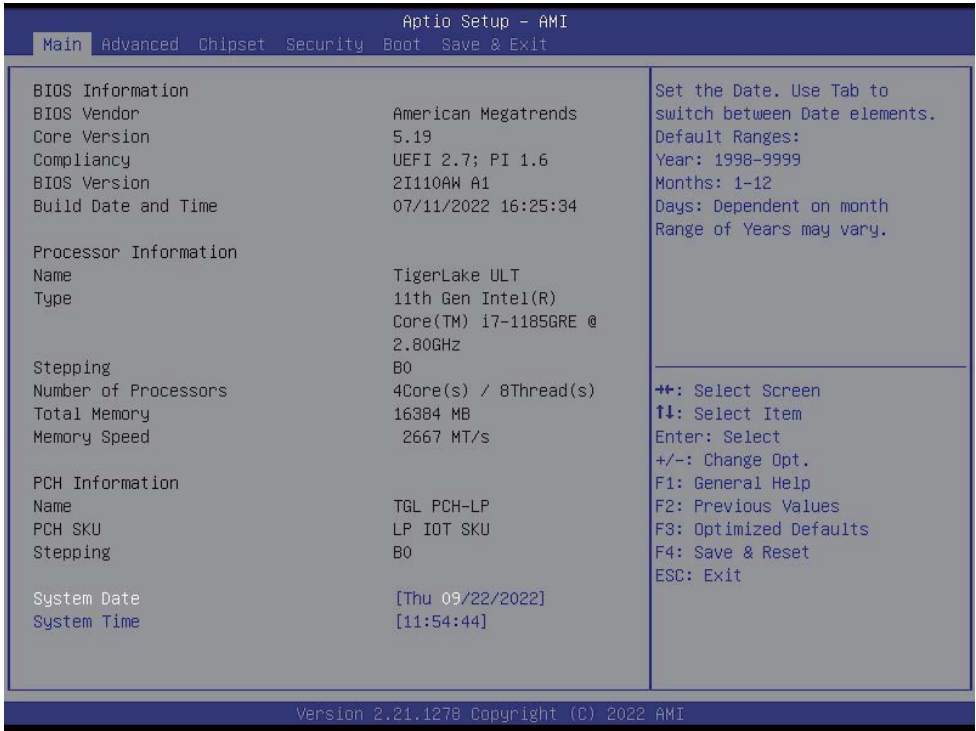
Press Page Up / Page Down or +/- keys to modify the BIOS parameters for the active option.

4-1 Enter Setup

Power on the computer and press 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 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

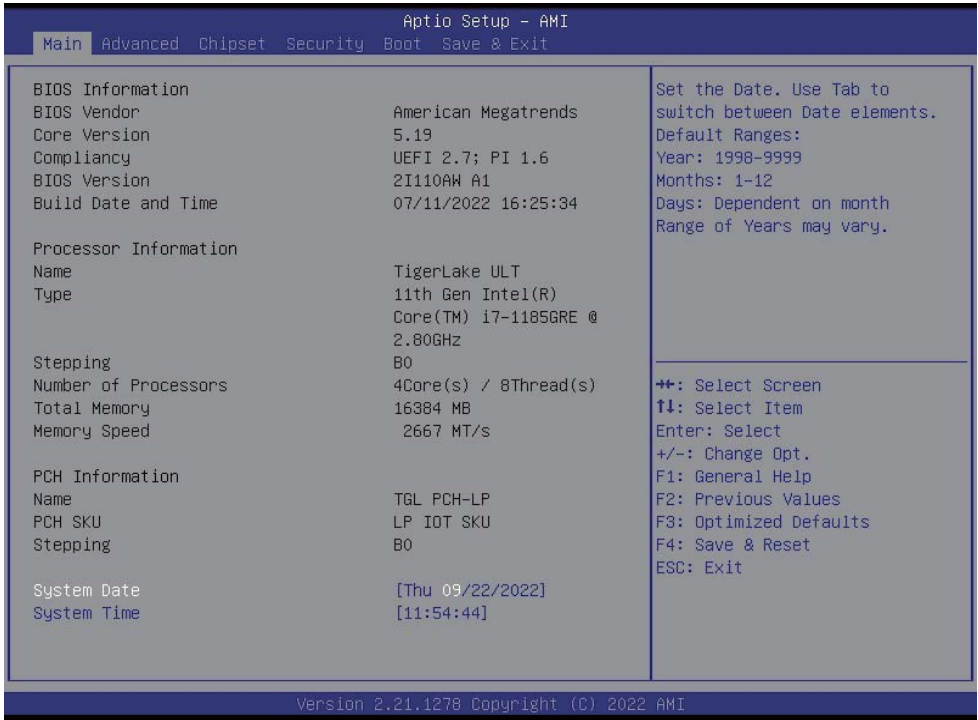
Boot Quiet boot or boot from USB selected.

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.

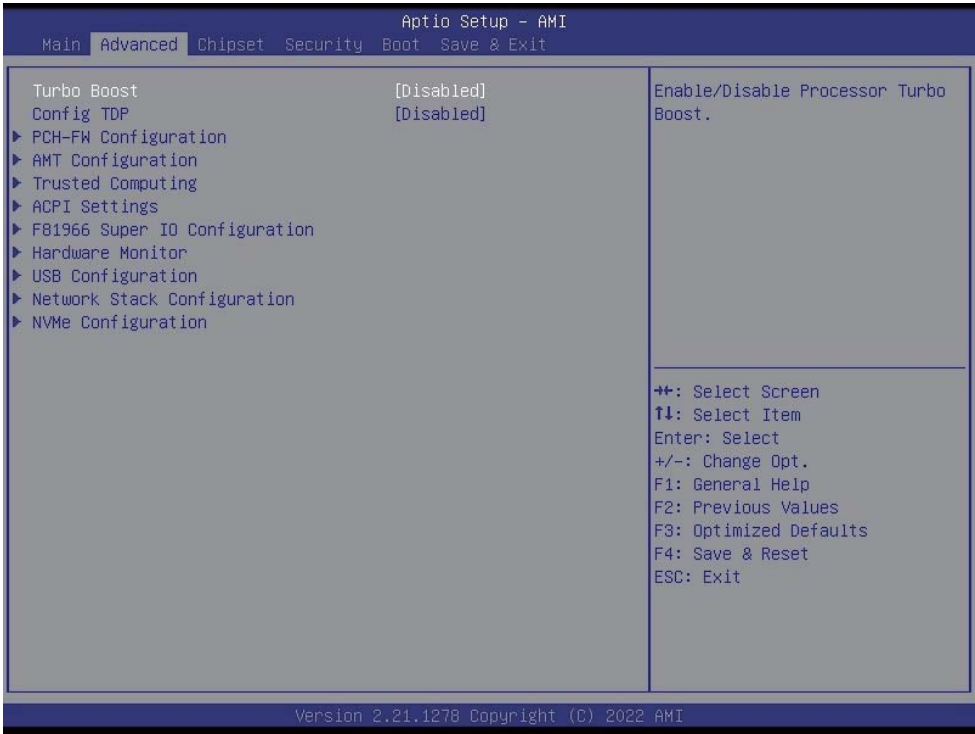
System Date

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

System Time

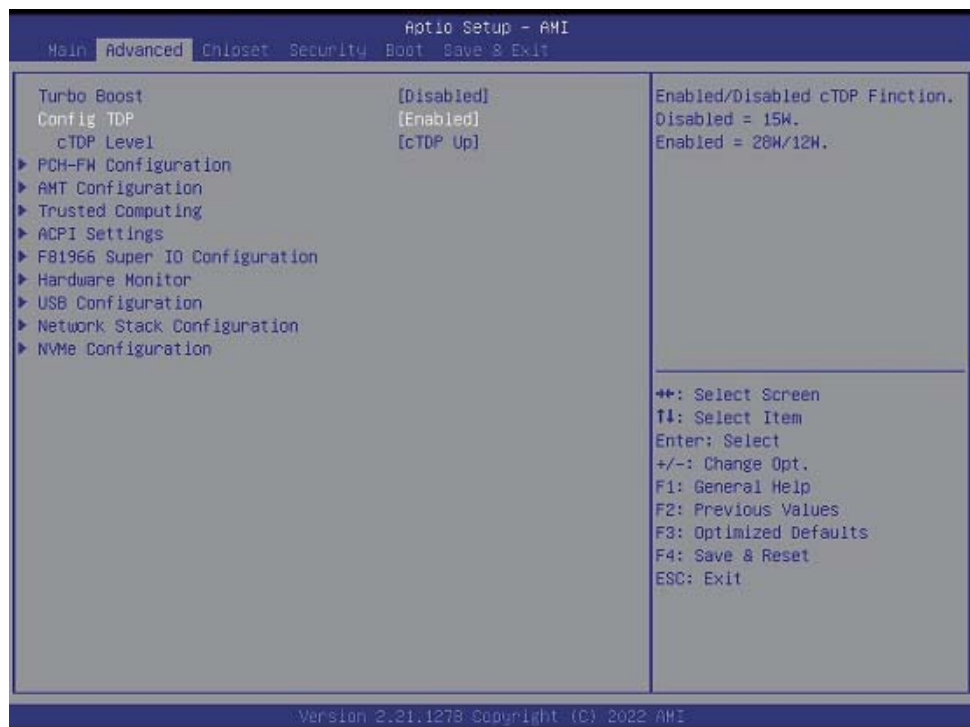
Set the Time. Please use [Tab] to switch between data elements.

4-6 Advanced



Turbo Boost

To turn on turbo boost or not, default is disabled.



Config TDP

Enabled to change the TDP up or TDP down, default is disabled.



cTDP Level

To change the TDP up(28W) or TDP down(12W), default is TDP(15W)

PCH-FW Configuration

Please refer section 4-6-1

AMT Configuration

Please refer section 4-6-2

Trusted Computing

Please refer section 4-6-3

ACPI Settings

Please refer section 4-6-4

F81966 Super IO Configuration

Please refer section 4-6-5

Hardware Monitor

Please refer section 4-6-6

USB Configuration

Please refer section 4-6-7

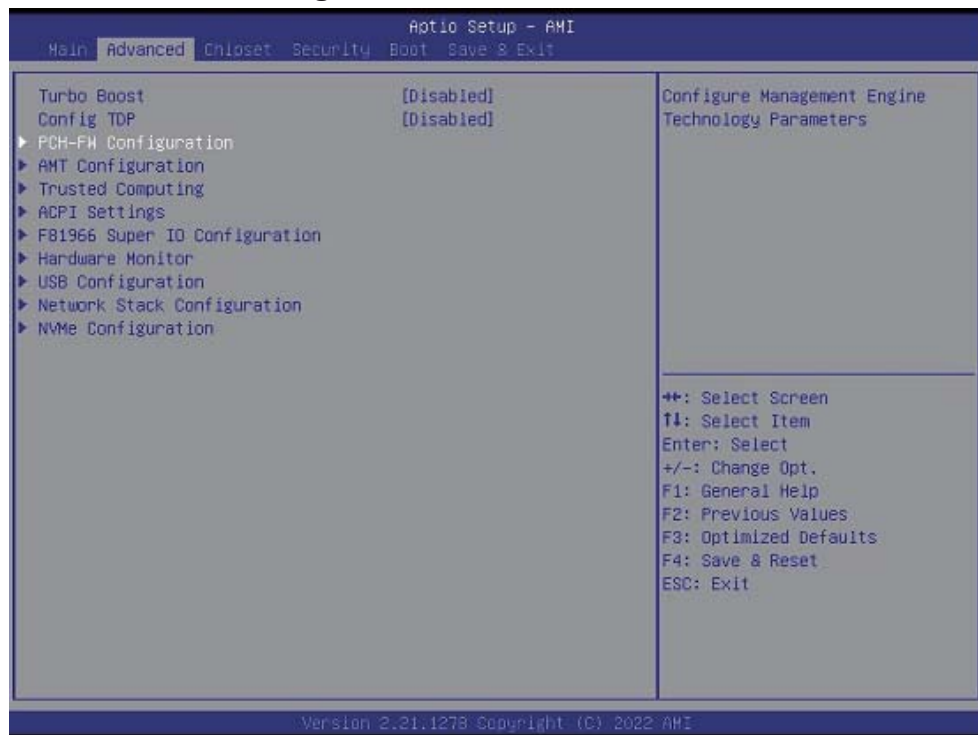
Network Stack Configuration

Please refer section 4-6-8

NVMe Configuration

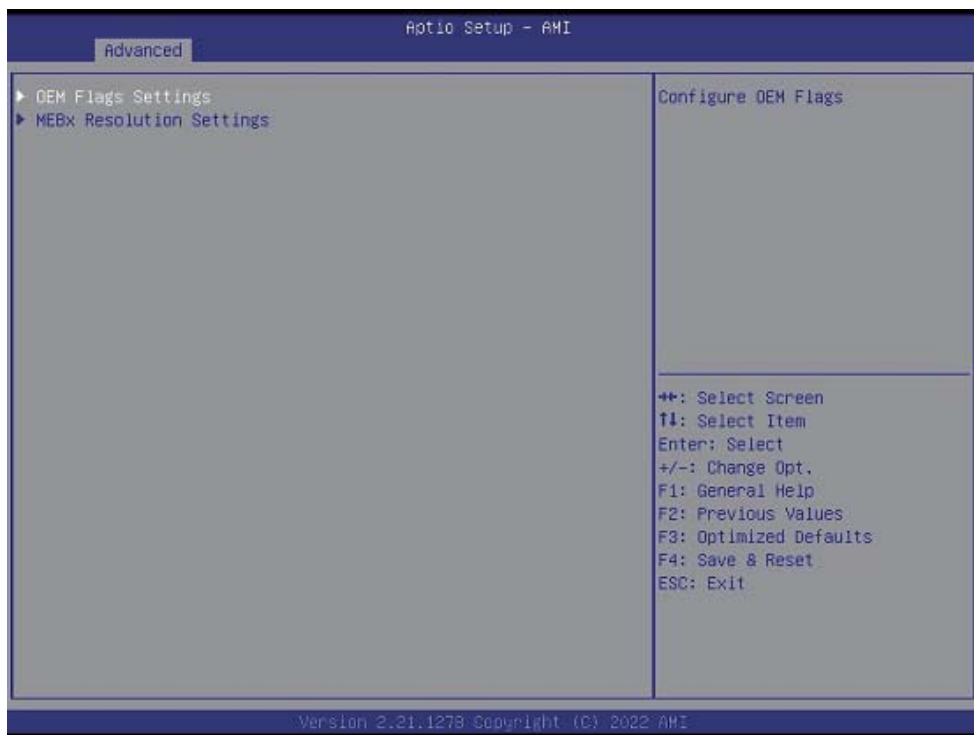
Please refer section 4-6-9

4-6-1 PCH-FW Configuration





4-6-2 AMT Configuration



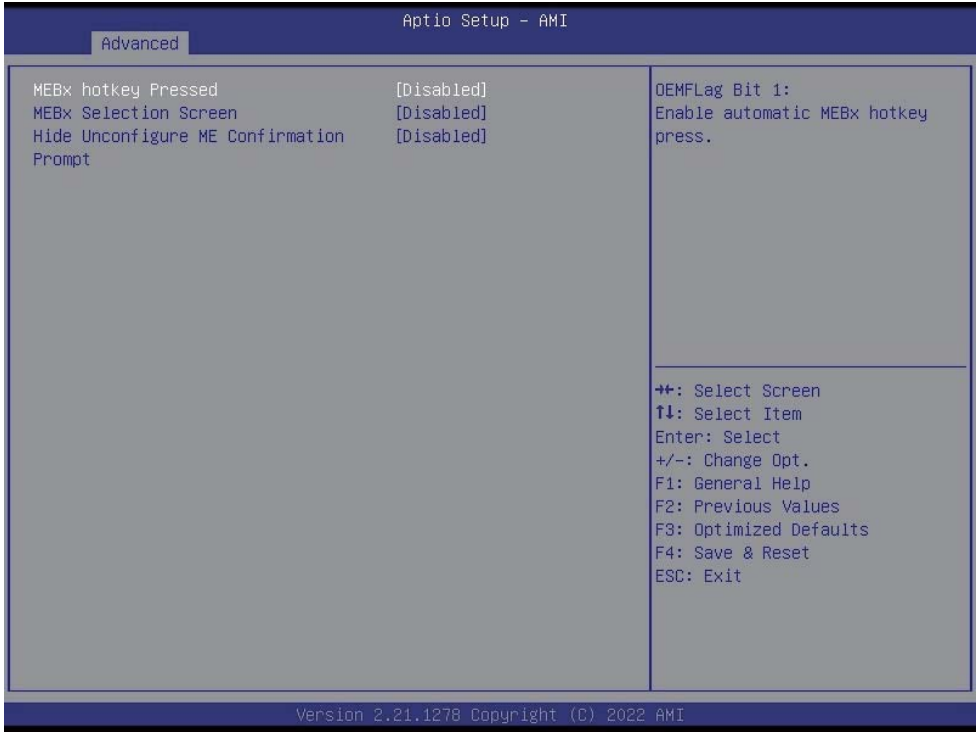
OEM Flags Settings

Please refer section 4-6-2-1

MEBx Resolution Settings

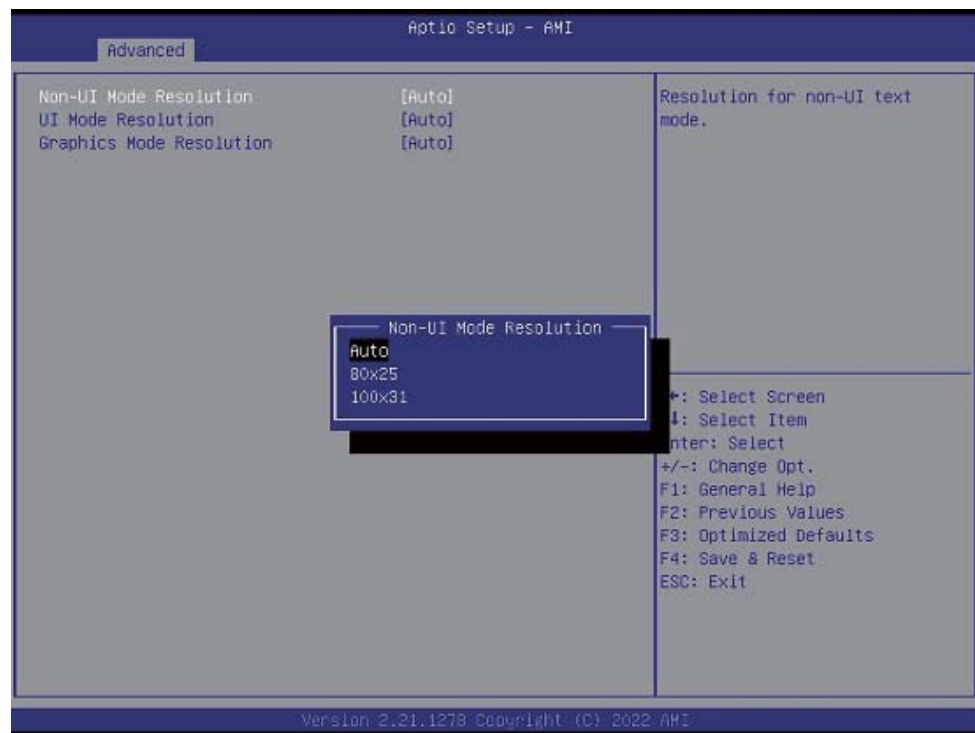
Please refer section 4-6-2-2

4-6-2-1 ► OEM Flags Settings

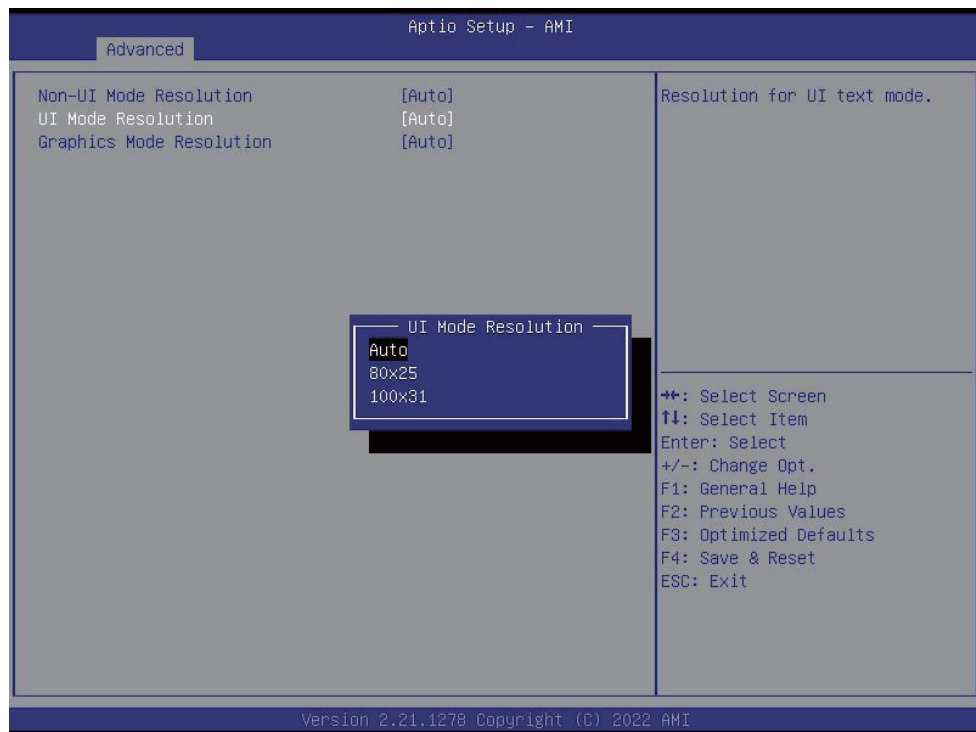


To enable Intel® Management Engine BIOS Extension settings, default is Disabled.

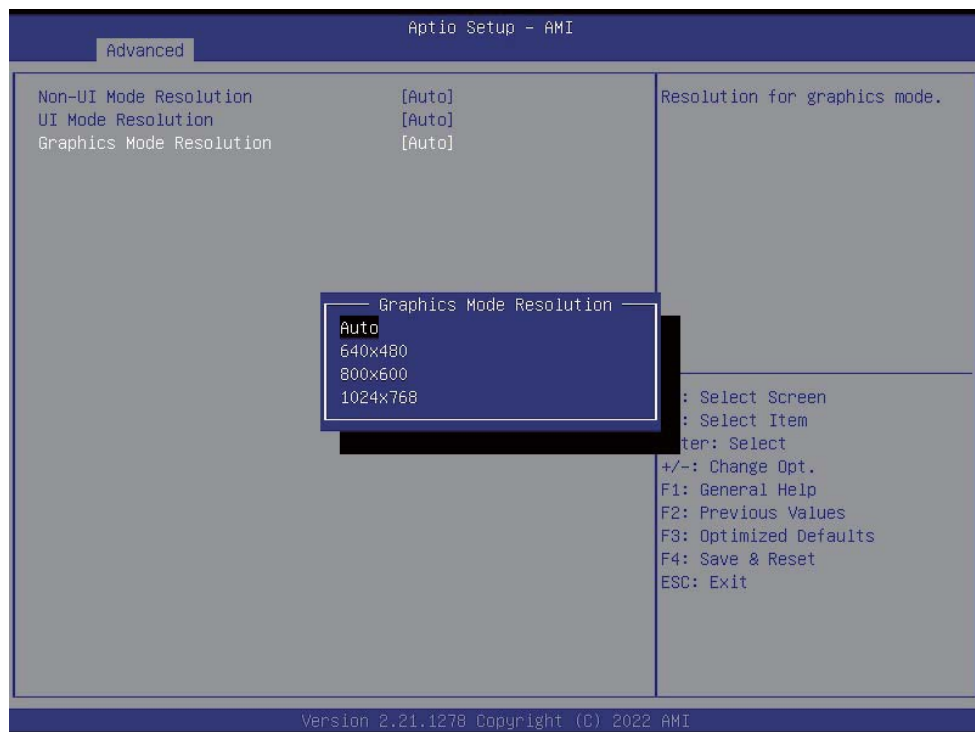
4-6-2-2 ► MEBx Resolution Settings



Non-UI Mode Resolution, there are auto, 80x25, 100x31, default is "Auto".



UI Mode Resolution, there are auto, 80x25, 100x31, default is "Auto".



Graphics Mode Resolution, there are auto, 640x480, 800x600, 1024x768, default is "Auto".

4-6-3 Trusted Computing

Aprio Setup - AMI		
Advanced		
TPM 2.0 Device Found		Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
Firmware Version:	600.7	
Vendor:	INTC	
Security Device Support	[Enable]	
Active PCR banks	SHA256	
Available PCR banks	SHA-1,SHA256,SHA384,SM3	
SHA-1 PCR Bank	[Disabled]	
SHA256 PCR Bank	[Enabled]	
SHA384 PCR Bank	[Disabled]	
SM3_256 PCR Bank	[Disabled]	
Pending operation	[None]	++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit
Platform Hierarchy	[Enabled]	
Storage Hierarchy	[Enabled]	
Endorsement Hierarchy	[Enabled]	
TPM 2.0 UEFI Spec Version	[TCG_2]	
Physical Presence Spec Version	[1.3]	
TPM 2.0 InterfaceType	[CRB]	
Device Select	[Auto]	

Version 2.21.1278 Copyright (C) 2021 AMI

Security Device Support

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

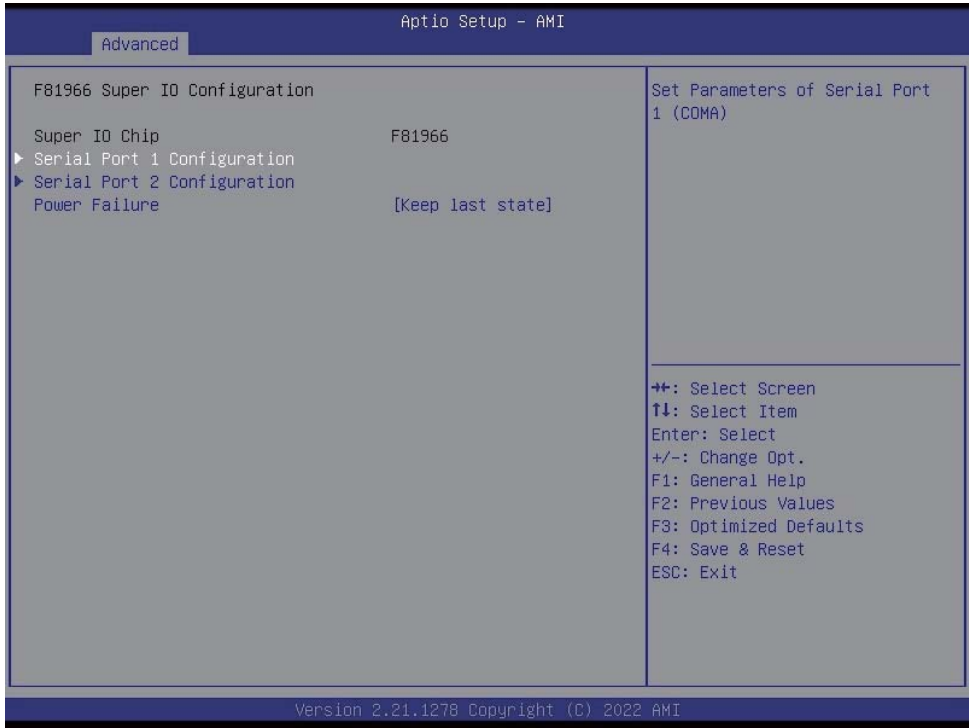
4-6-4 ACPI Settings



ACPI S3 Support

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

4-6-5 F81966 Super IO Configuration



Serial Port 1 Configuration

Please refer section 4-6-5-1

Serial Port 2 Configuration

Please refer section 4-6-5-2

Power Failure

Please refer section 4-6-5-3

4-6-5-1 ► Serial Port 1 Configuration

Advanced

Aptio Setup - AMI

Serial Port 1 Configuration

Serial Port

Device Settings

Change Settings

Serial Mode

[Enabled]

IO=3F8h; IRQ=4;

[Auto]

[RS232]

Enable or Disable Serial Port (COM)

⚡: Select Screen

⬆⬆: Select Item

Enter: Select

+/-: Change Opt.

F1: General Help

F2: Previous Values

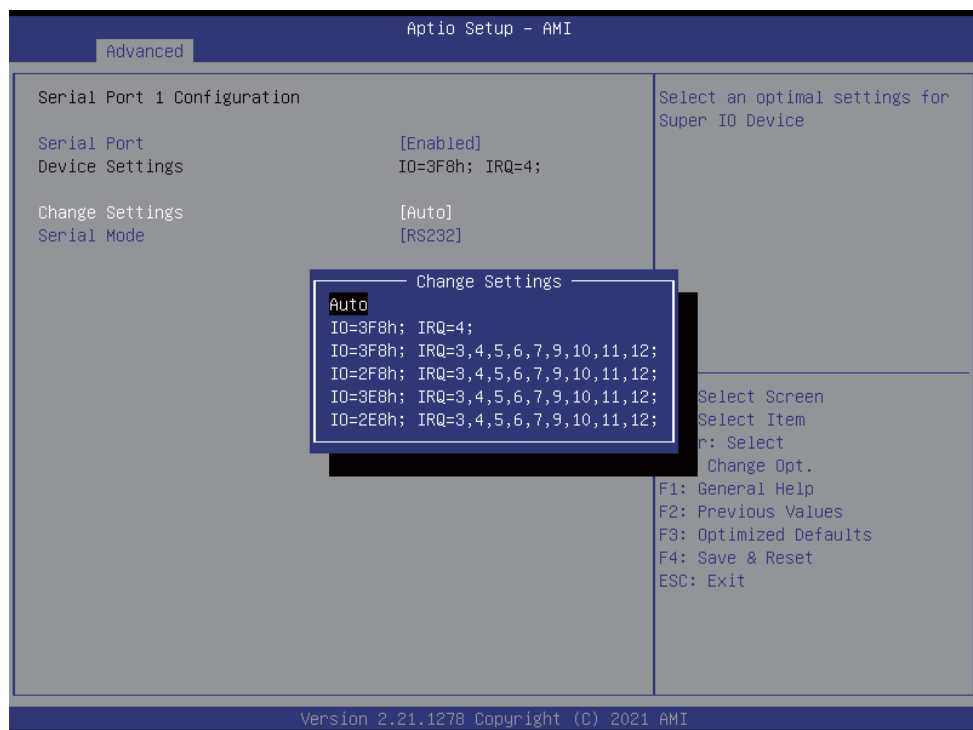
F3: Optimized Defaults

F4: Save & Reset

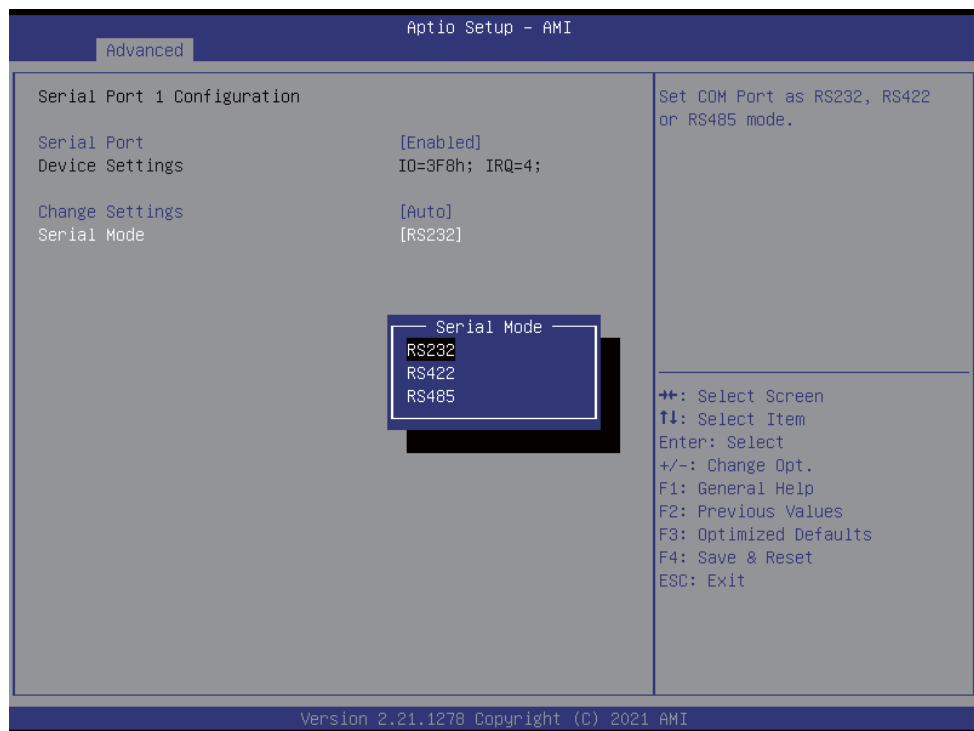
ESC: Exit

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To Enable Serial port or not, default is Enabled.



Change Settings, default is Auto.

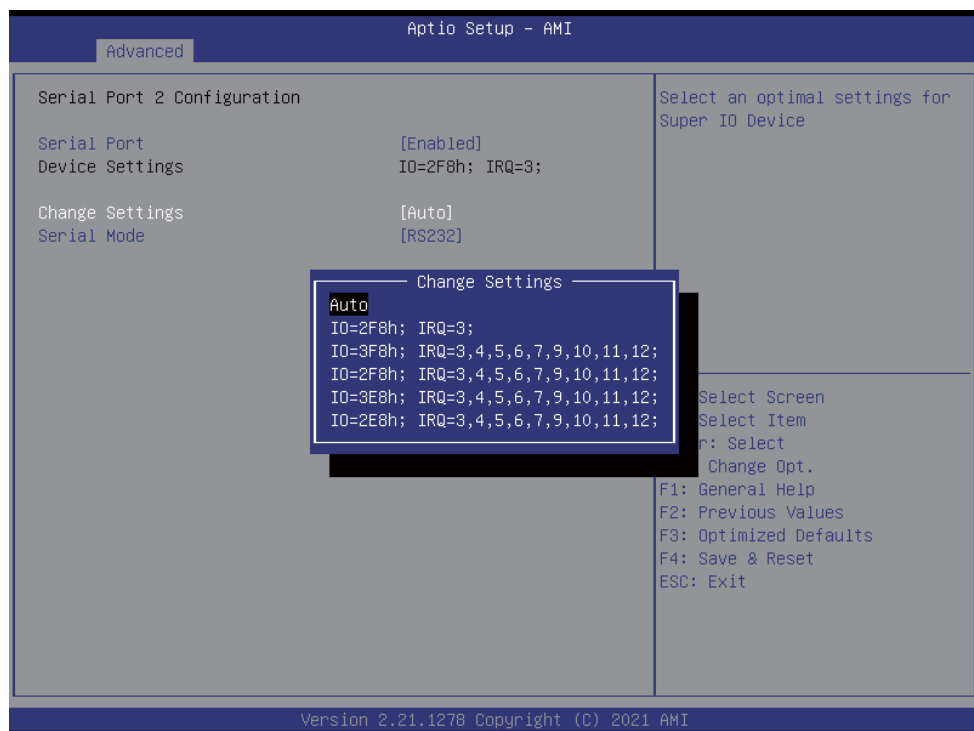


To select the Serial port to RS232 / RS422 / RS485, default is RS232.

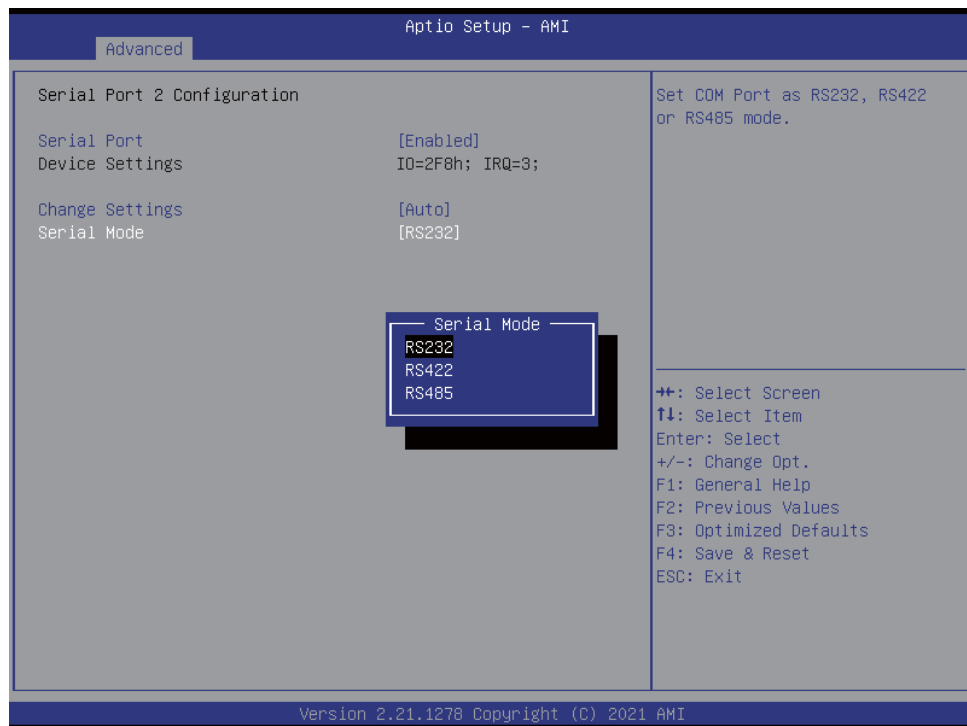
4-6-5-2 ► Serial Port 2 Configuration

Aptio Setup - AMI		
Advanced		
Serial Port 2 Configuration		Enable or Disable Serial Port (COM)
Serial Port	[Enabled]	
Device Settings	IO=2F8h; IRQ=3;	
Change Settings	[Auto]	
Serial Mode	[RS232]	
		⬆⬆: Select Screen ⬆⬆: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit
Version 2.21.1278 Copyright (C) 2021 AMI		

To Enable Serial port or not, default is Enabled.

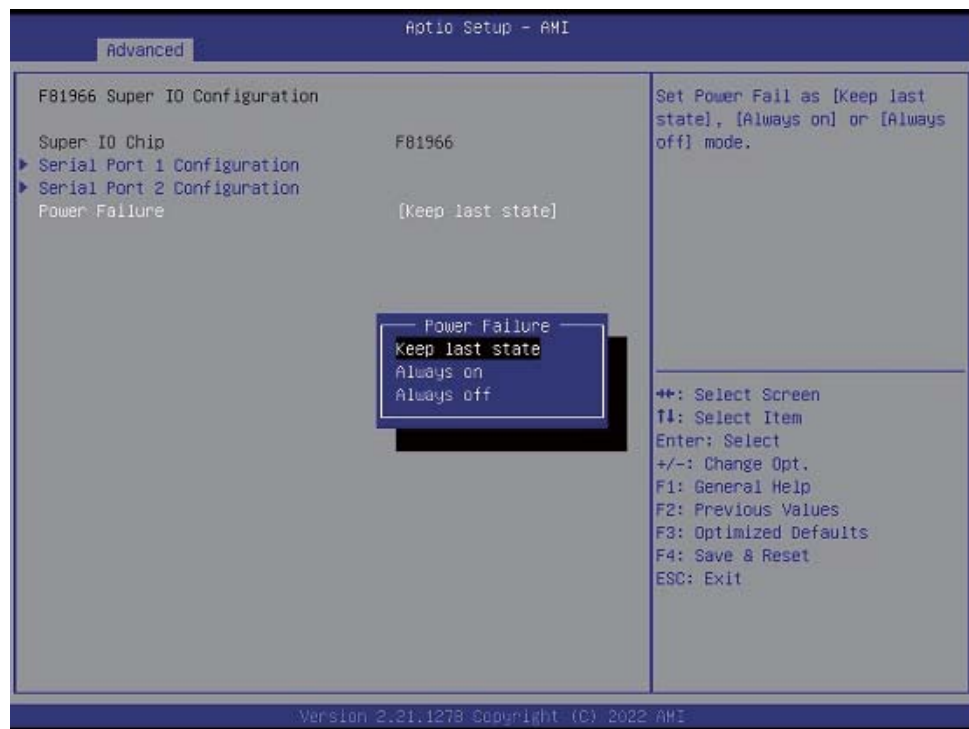


Change Settings, default is Auto.



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

4-6-5-3 ► Power Failure



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

4-6-6 Hardware Monitor

Advanced

Aptio Setup - AMI

Pc Health Status

▶ Smart Fan Configuration

CPU Temperature : +44 C

SYSTEM Temperature : +37 C

CPU Fan : N/A

VCCIN : +1.288 V

VCCIN AUX : +1.808 V

VDDQ : +1.200 V

VCC3V : +3.248 V

VSBB3V : +3.312 V

VSBB5V : +5.064 V

VBAT : +3.168 V

Smart Fan Configuration.

↔: Select Screen

↑↓: Select Item

Enter: Select

+/-: Change Opt.

F1: General Help

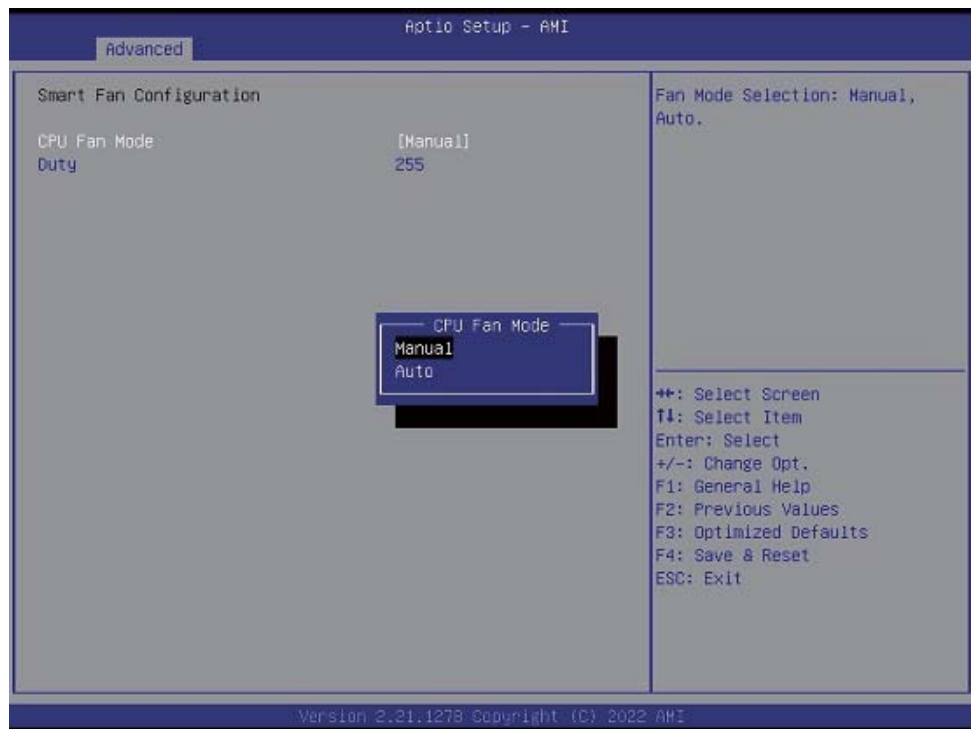
F2: Previous Values

F3: Optimized Defaults

F4: Save & Reset

ESC: Exit

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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.

4-6-7 USB Configuration

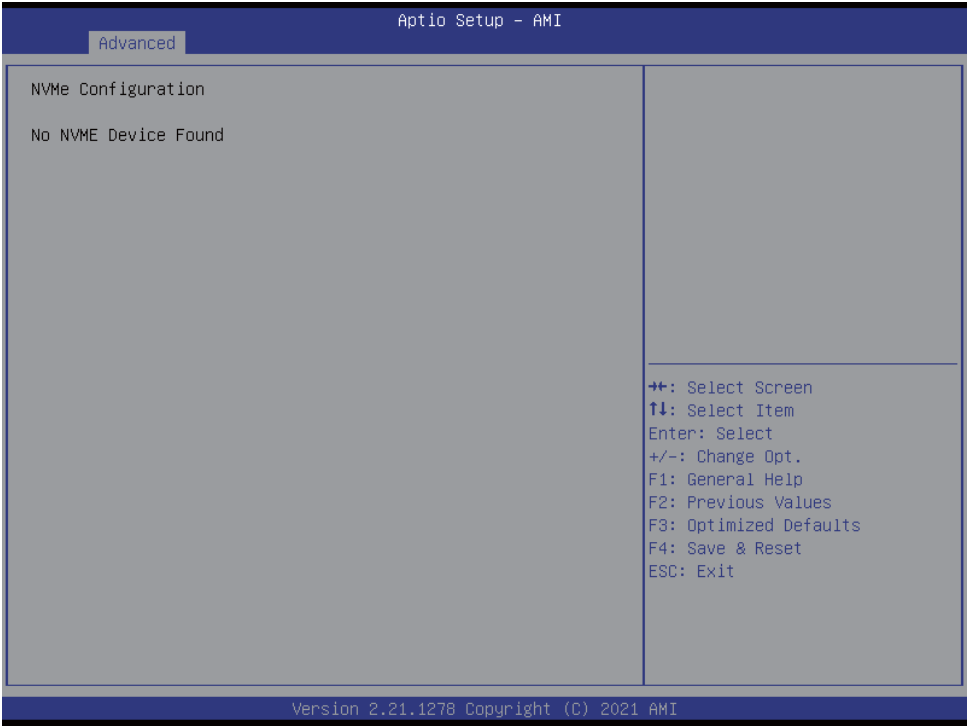
Aptio Setup - AMI	
Advanced	
<p>USB Configuration</p> <p>USB Controllers: 2 XHCIs</p> <p>USB Devices: 1 Drive, 1 Keyboard, 1 Mouse</p> <p>Mass Storage Devices: KingstonDT 101 II PMAP [Auto]</p>	<p>Mass storage device emulation type. 'AUTO' enumerates devices according to their media format. Optical drives are emulated as 'CDROM', drives with no media will be emulated according to a drive type.</p> <p>→+: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit</p>
Version 2.21.1278 Copyright (C) 2021 AMI	

4-6-8 Network Stack Configuration



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

4-6-9 NVMe Configuration



To detect NVMe storage automatically.

4-7 Chipset



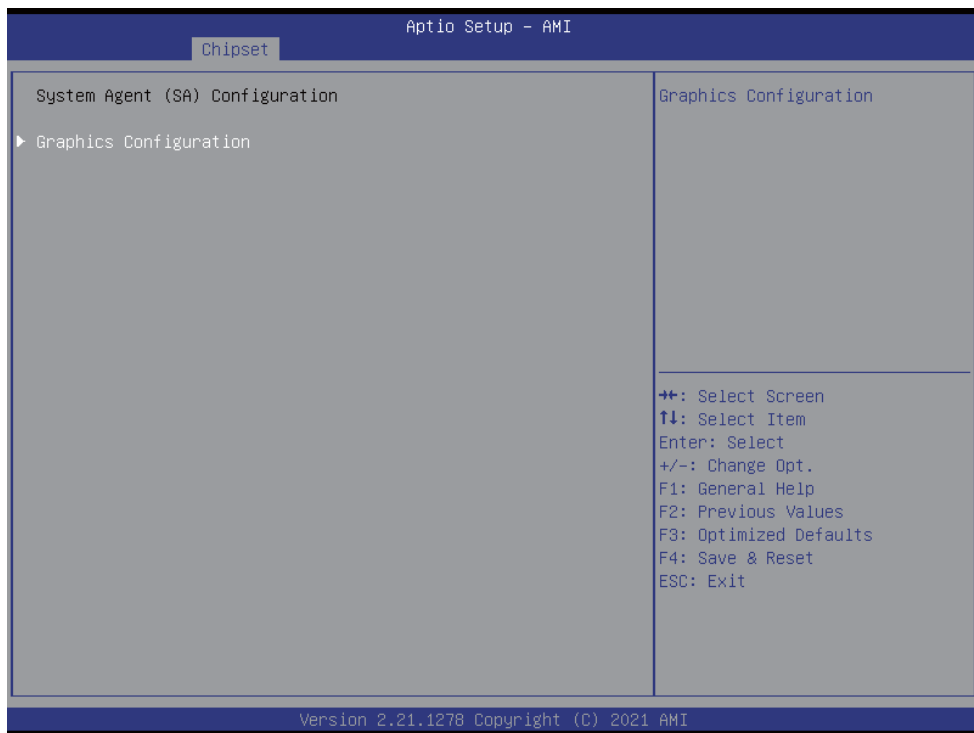
System Agent (SA) Configuration.

Please refer section 4-7-1

PCH-IO Configuration.

Please refer section 4-7-2

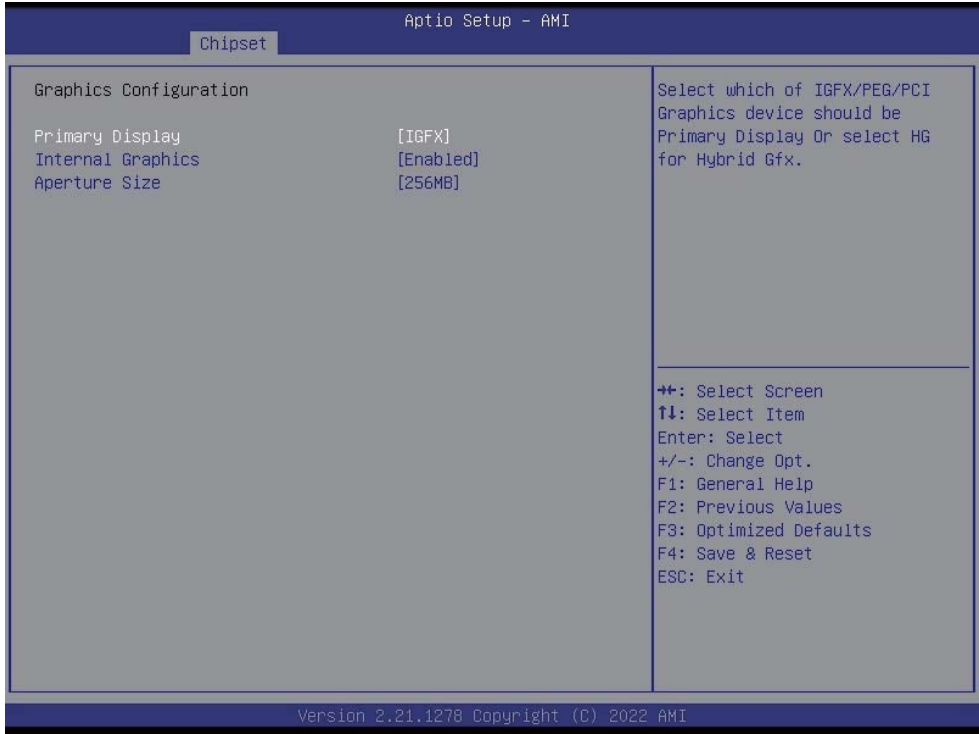
4-7-1 System Agent (SA) Configuration



Graphics Configuration.

Please refer section 4-7-1-1

4-7-1-1 ► Graphics Configuration



Primary Display

Primary display. The optional settings are: Auto, IGFX, PCH PCI

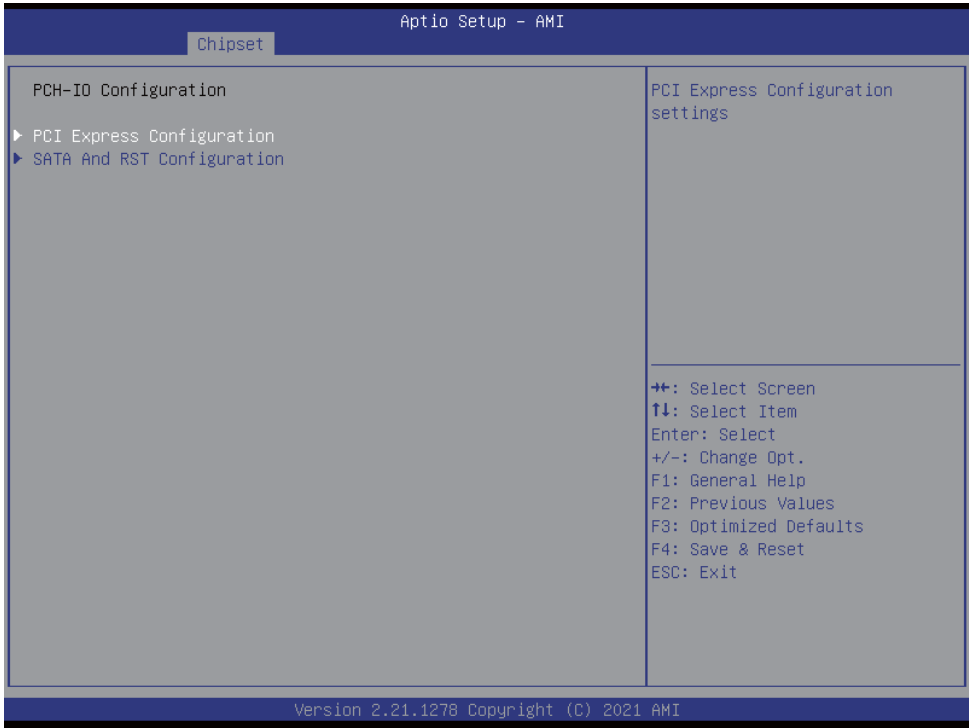
Internal Graphics

Graphics Translation Table Size. The optional settings are: Auto, Disabled, Enabled

Aperture Size

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

4-7-2 PCH-IO Configuration



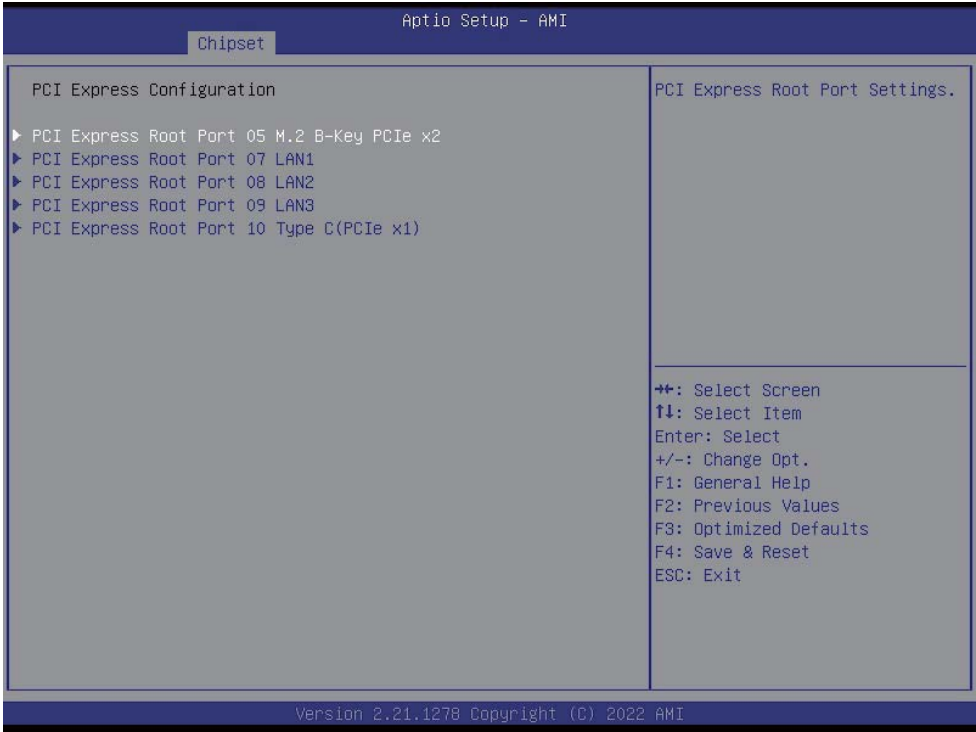
PCI Express Configuration.

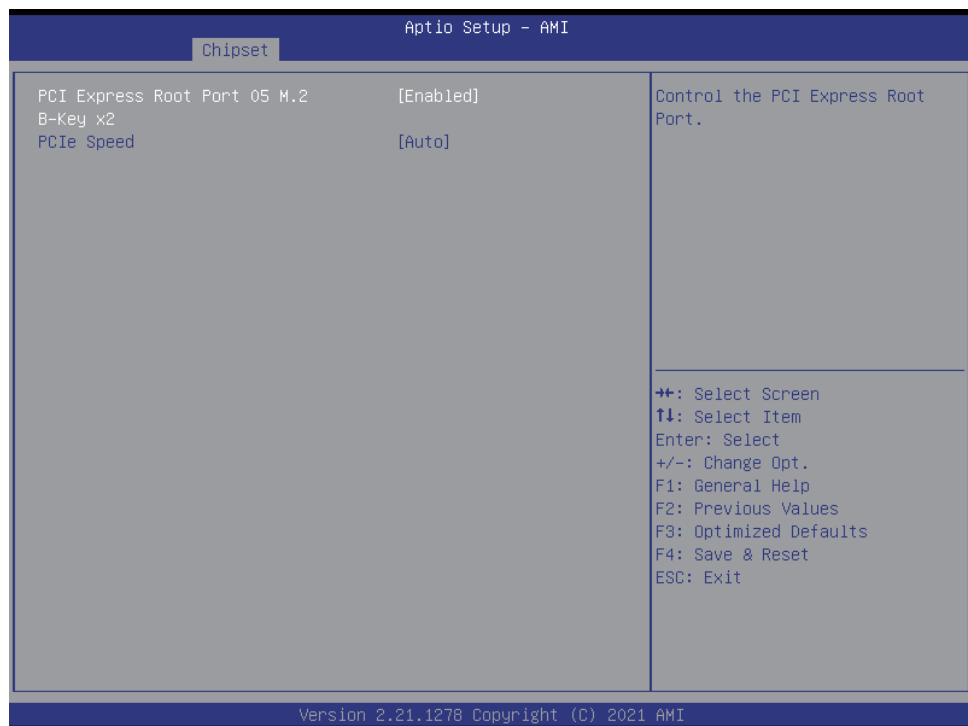
Please refer section 4-7-2-1

SATA And RST Configuration.

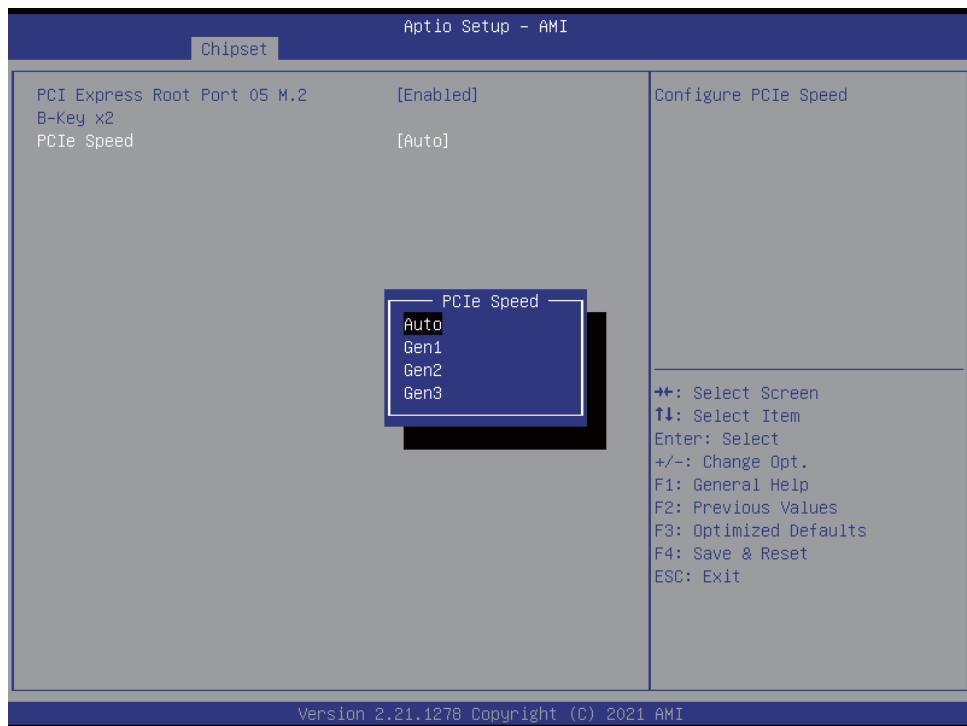
Please refer section 4-7-2-2

4-7-2-1 ► PCI Express Configuration



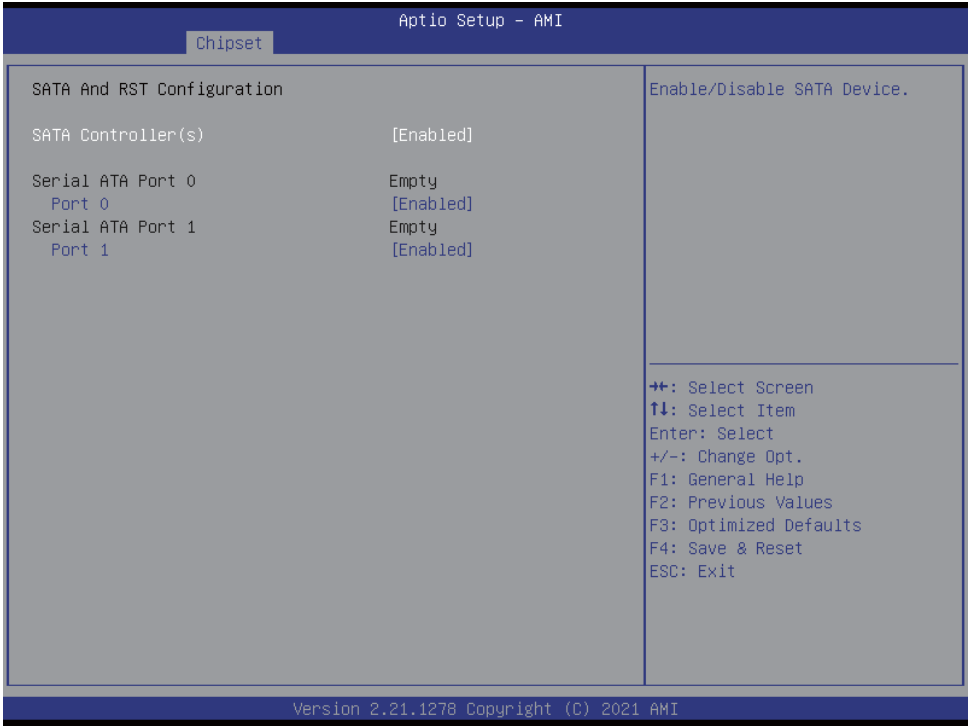


The optional settings are: Enabled (default), Disabled.



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

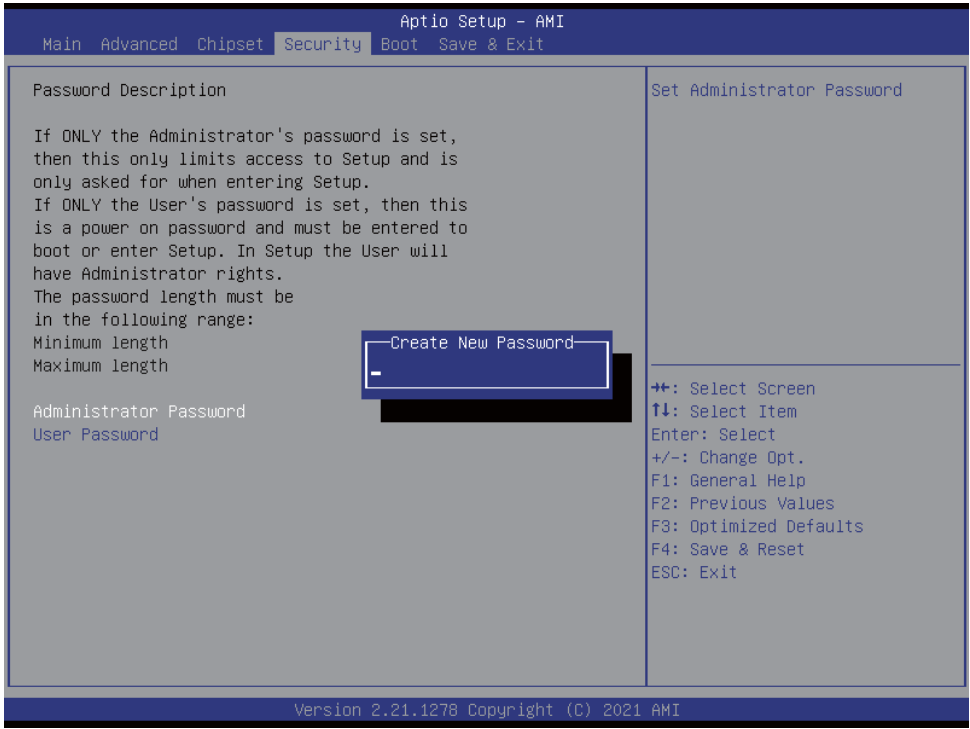
4-7-2-2 ► SATA And RST Configuration



SATA Controller

Use this item to Enable or Disable SATA Device.

4-8 Security

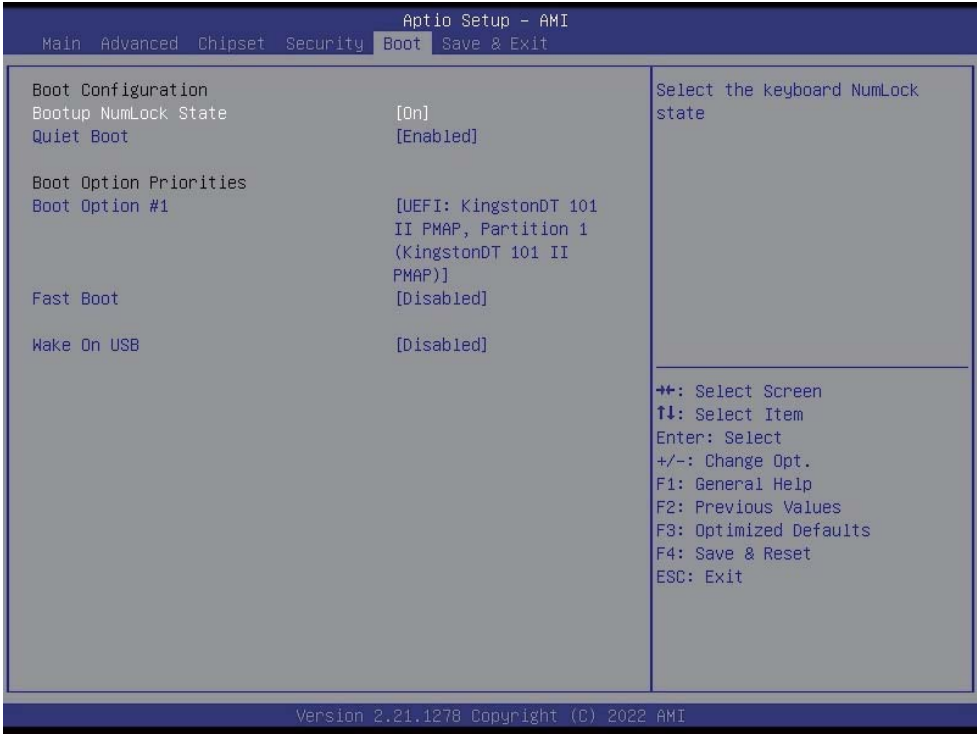


Administrator Password

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>

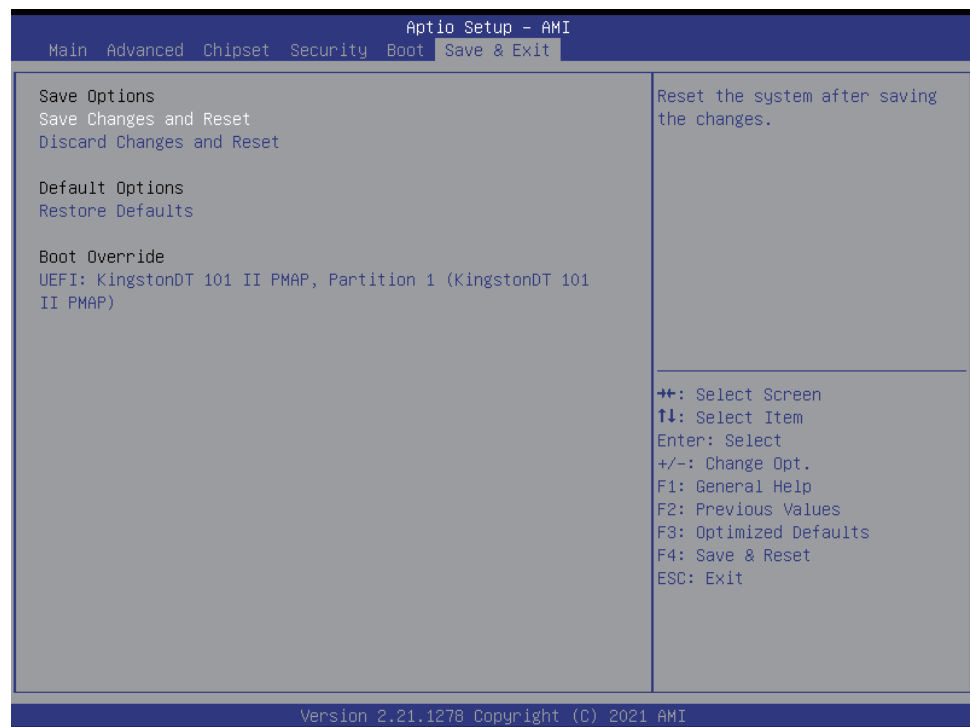
Quiet Boot

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 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 2I110AW 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 2I110AWA2.ROM -BIOS -ALL

2I110AWA2.ROM is the file name of the latest BIOS.

It may be 2I110AWWA1.ROM or 2I110AWWA2.ROM, etc.

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

By Bay Trail series mainboard, please type

X:\: H2OFFT-D.EXE 2I110AWWA2.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)