ALAD-K1550T(P)

User's Manual

Ver.A0.2

Date：2023-06-29

Version Note

No.	Ver.	Note	Date	Writer	Check
1	A0.1	First publish	2023.05.29	Zeqi	Colin
2	A0.2	The installation part of the whole machine is added, the USB2.0 function is removed from the F_PANEL pin, the LCD screen resolution is changed from the jump cap setting to the brush firmware setting, and a burning file corresponds to a resolution.	2023.06.29	Lvyifeng	Colin

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2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
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Declaration of Conformity

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from JHC. Please contact your local supplier for ordering information. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class A

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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Step 1. Visit the JHC web site at www.jhctech.com.cn where you can find the latest information about the product.

Step 2. Contact your distributor, sales representative, or JHC's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:

- Product name and serial number
- Description of your peripheral attachments
- Description of your software (operating system, version,application software, etc.)
- A complete description of the problem
- The exact wording of any error messages

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CHAPTER 1

General Information

1.1 Introduction

The ALAD-K1550T(P) is an intelligent fanless embedded panel with Intel® Tigerlake U Celeron/Core I3/I5/I7 processors. It is adopted 15.6 "1920*1080 resolution full HD TFT LCD, fully fit surface projection multi-point capacitive touch screen.

The product features comprehensive I/O interface, 1*HDMI HD display interface, 2* Gigabit network port, 4*USB3.2, 4*COM (2*RS232/422/485 and 2*RS232), 1*Mini PCIe (PCIe&USB signal), 1*M.2 B-Key Type 3042/3052 with SIM card slot, 4G LTE/5G NR support, optional 1 PCIeX4 slot (X4 signal) or 1 32-bit PCI slot expansion, 2*3W power amplifier speaker, 1*Line out. The storage has 1*2.5 "SATA disk and 1*mSATA. The power supply supports DC input from 9 to 36V.

1.2 Features

- Aluminum die–casting chassis, Full Flat Mirror Panel
- 15.6" Full HD LCD, Multi-point capacitive touch
- Intel® Tigerlake CPU, fanless design
- 1*DDR4 3200 SODIMM, up to 32GB
- 1*Mini PCIe, 1*M.2 B-Key Type 3042/3052
- 4*COM, 2*LAN, 4*USB3.2, 1*8-bit DIO (opt.)
- 2.5”SATA Bay, 1*mSATA, 1*Line out, 2*3W Speaker
- Optional 1*PCIeX4 slot (PCIEX4 signal) or 1*PCI slot expansion
- DC 9~36V power input
- Standard VESA mount and panel mounting

1.3 Specifications

1.3.1 General

CPU: Intel® Tigerlake U Celeron/Core I3/I5/I7 CPU，ULT SoC, TDP 12W/15W

Chipset: Intel® CPU SoC MCP

Memory: 1*DDR4 3200 MHz SODIMM, up to 32GB

BIOS: AMI EFI BIOS, 128Mbit SPI flash memory

USB: 2*USB3.2 (Type A)，1*USB2.0 (1*4pin，inside)

Serial Ports： 4*COM: 2*RS232/422/485, 2*RS232, DB9

DIO： 1*8-bit DIO (opt.)

Expansion Interface:

1*Mini PCIe (PCIe&USB signal), supports a functional module with PCIe or USB signals

1*M.2 B-Key Type 3042/3052 with SIM card slot, supports 4G LTE/5G NR

Optional a PCIeX 4 slot (X4 signal) or a 32-bit PCI slot extension

Storage:

1*2.5" SATA HDD bay, support SATA3.0 6Gbps HDD/SSD; 1*mSATA

1.3.2 Graphics, LCD, Touch

Chipset : Intel UHD Graphics or iRIS® Xᵉ Graphics, Supports the Intel DL boost deep learning to strengthen technology, DirectX12.1, OpenGL 4.6 and OpenCL 3.0

Resolution: HDMI 2.0 up to 4096*2304@60Hz

LCD：

Type	15.6" TFT LED backlight
Resolution	1920*1080@60Hz
Color	16.2M
Pixel Pitch(mm)	0.17925*0.17925(mm)
Brightness(cd/m2)	350
Viewing Angle	85°(left), 85°(right), 85°(up), 85°(down)
Operating Temperature	0~50℃
Backlight Lifetime	15000 Hours

TOUCH:

Type	Projected capacitive touch
Resolution	1920*1080
Light Transmittance	≥85%
Interface	EETI Industrial grade
Consumption	+5V @300mA
OS	Windows/Linux
Click Lifetime	3 billion times

1.3.3 Ethernet

Chipset: 2*Intel I226V PCIe Gig. Ethernet, 10/100/1000Mbps, support WOL

Speed: 10M / 100M / 1000Madaptive

Interface: 2*RJ45 w/LED

1.3.4 Audio

Chipset: Realtek ALC897 controller, support 5.1 channel, 2*3W Speaker

Interface: 1* Line out, 3.5mm audio interface, 2*3W Speaker

1.3.5 Power Consumption

Input Voltage: DC 9~36V wide power input,，with short circuit, over voltage and over current protection

Power Consumption: 11.52W (CPU i7-1165G7, 8G DDR4, 128G SSD)

Power Adapter:

AC/DC power adapter · DC12V@5A ,60W

AC/DC power adapter · DC19V@6.32A ,120W (when use POE network card for expansion)

1.4 Environmental requirement

Operating temperature: 0~50℃ –HDD(–10~55℃ –SSD), with airflow

Relative humidity:10~95%@40 , non–condensing

Storage temperature: -20 ~ 60°C

Vibration loading during operation: 1g 5~500Hz, in operating with HDD

Shock during operation: 10g peak acceleration(duration 11ms), in operating with HDD

EMC: CE, FCC Class A

1.5 Ordering Information

Model NO.	CPU	TOUCH	Description

ALAD-K1550T(P)/ S001	Intel® Core I3-1115G4	Projected Capacitive Touch	Industrial panel computer, 15.6" TFT LCD, 4*COM, 4*USB3.2, 1*USB2.0, 2*LAN, 1*HDMI, 1*Mini PCIe, 1*M.2 B-Key , 1*Line out, 1*2.5"SATA Bay,
ALAD-K1550T(P)/ S002	Intel® Core I5-1135G7		
ALAD-K1550T(P)/S003	Intel® Core I7-1165G7		
ALAD-K1550T(P)/S004	Intel® Celeron 6305E		
ECX-168	1*PCIeX4 slot(X4 signal）(non COM3&4 in use)		
ECI-169	1*32-bit PCI slot (non COM3&4 in use)		
PA-60DC12	AC/DC power adapter, DC12V@5A ,60W		
PA-120DC19	AC/DC power adapter, DC19V@6.32A ,120W (when use POE network card for expansion)		

1.6 Dimension

ALAD-K1550T(P) Dimension（Unit：mm）

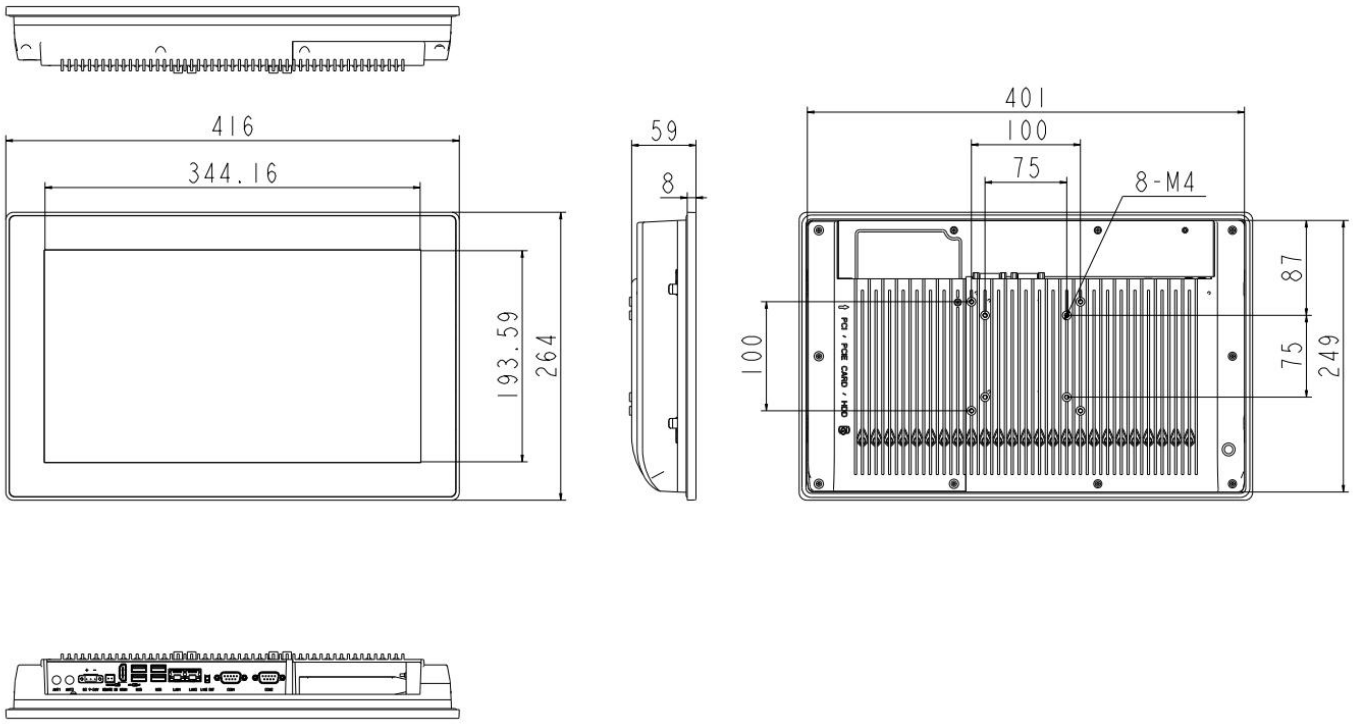


Figure 1.1

1.7 I/O Interface

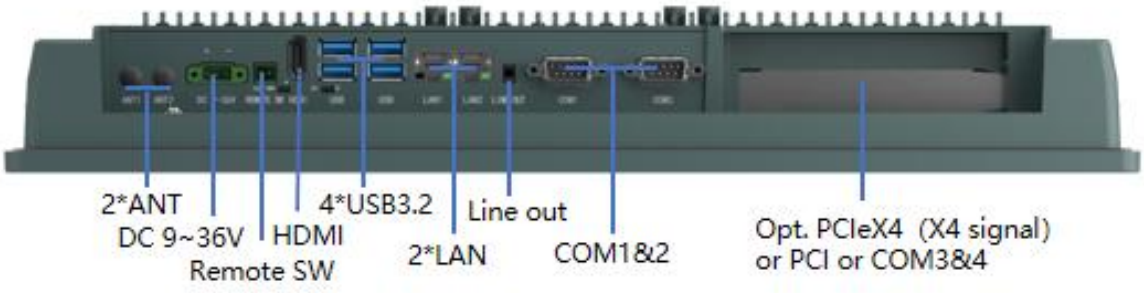


Figure 1. 2

CHAPTER 2

Hardware Installation

2.1 Introduction

The following chapters will state the panel DIP switch settings and external connectors and pin assignments of the product.

2.2 Panel DIP switch settings and jumpers

The ALAD-K1550T(P) r is equipped with a simple DIP switch on the panel. This simple DIP switch can be toggled with tweezers or a card pin, which is convenient for users to set according to different configuration requirements. The following table lists the function of each DIP switch and jumpers on the panel.

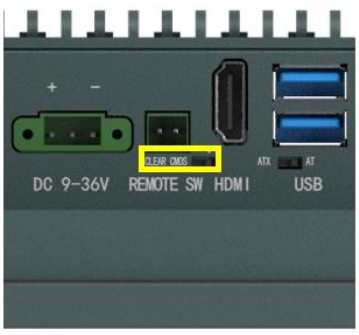
DIP switch list:

Model No.	Introduction	Describe
AT/ATX	Set the power-on mode to AT or ATX	3-Pin SW
CLEAR/CMOS	Clear CMOS data and restore default settings	3-Pin SW

Jumpers list:

Model No.	Introduction	Describe
LVDS_PWR	LVDS screen 3.3V/5V/12V Power supply Select	header
EDP_PWR	EDP screen 3.3V/5V/12V Power supply Select	header
LVDS_PANEL	LCD screen resolution jumper Settings	header
COM_SEL1	Set COM1&COM2 mode	header

2.2.1 AT/ATX Power-on mode selection switch



CLEAR Mode: Clear CMOS data

*CMOS Mode: Keep CMOS data

*default

Figure 2.1

The CMOS is powered by the socket BAT battery. Clearing CMOS will permanently erase the previous system settings and set them to the original (factory settings) system settings.

When you encounter the following problems:

a) COMS data is messy and lost;

b) Forgot the super password and user password;

You can store the default values in the ROM BIOS to reconfigure your system. The steps:

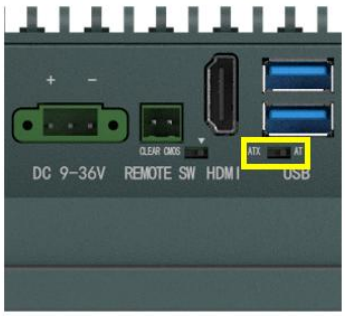
(1) Turn off the computer and disconnect the power supply;

(2) Toggle the DIP switch to CLEAR mode, stay for 5~6 seconds, and then return to CMOS mode;

(3) Start the computer, press the Del key to enter the BIOS settings during startup, and reload the optimal default values;

(4) Save and exit the setting.

2.2.2 AT/ATX Power-on mode selection switch



*AT Mode: Power on by DC Power

ATX Mode: Power on by Power Button

*default

Figure 2.2

ALAD-K1550T(P) provides AT/ATX switch, users can use tweezers to toggle the DIP switch to set the machine's boot mode. When you switch it to AT mode, it means turning on the DC power and turning it on; when turning it to ATX, it means turning it on by the power switch button.

2.2.3 LVDS Power supply 12V/5V/3.3V Mode Select

It is used to select the power supplied of LVDS panel. Before powering on the LCD, ensure that the correct voltage is selected. An incorrect voltage may damage the LCD.

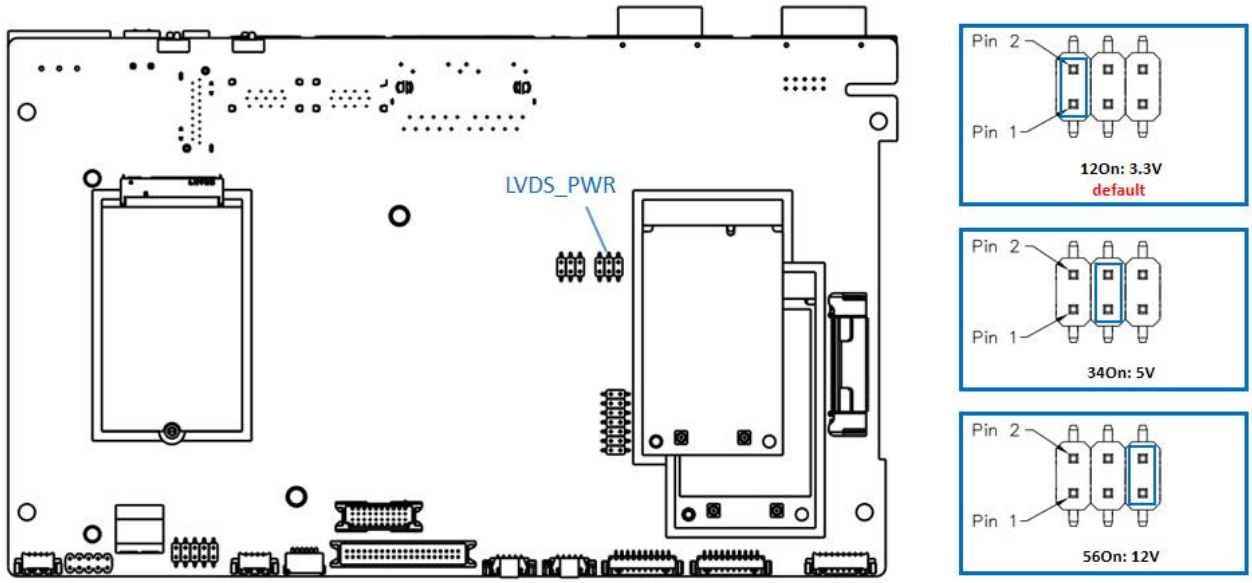


Figure 2.3

2.2.4 eDP Power supply 12V/5V/3.3V Mode Select

It is used to select the power supplied of eDP panel. Before powering on the LCD, ensure that the correct voltage is selected. An incorrect voltage may damage the LCD.

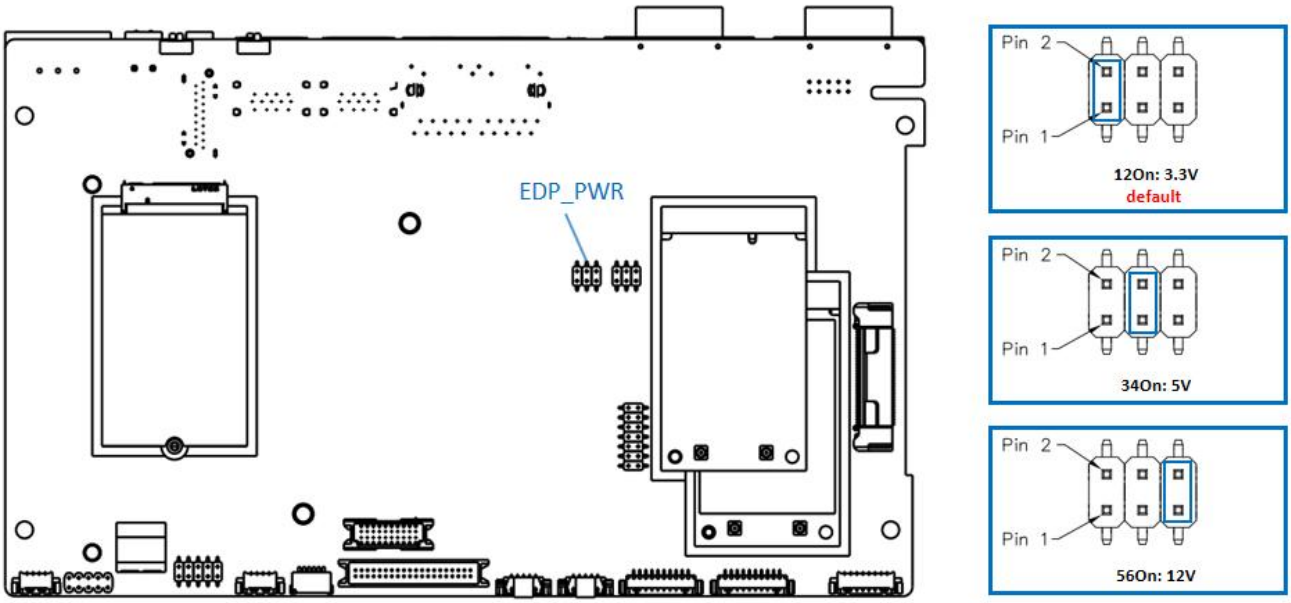


Figure 2.4

2.2.5 LCD screen resolution brush firmware Settings

It is used to select the power supplied of eDP panel. Before powering on the LCD, ensure that the correct voltage is selected. An incorrect voltage may damage the LCD.

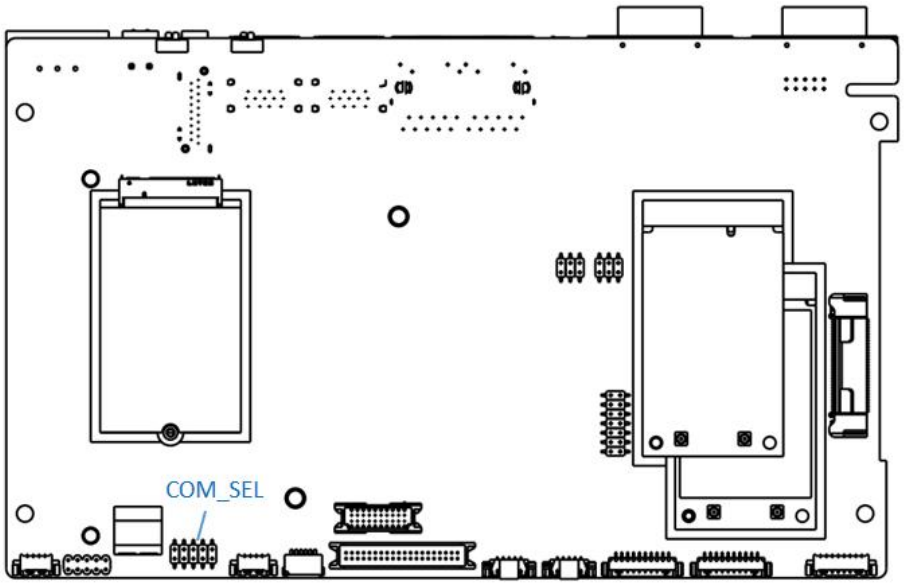


Figure 2.5

2.2.6 COM1&COM2 mode selection

COM_SEL1 can be used to select the COM1&2 serial port mode. Before installation, confirm the serial port mode required by the customer to avoid incorrect selection. In addition, select the serial port mode on the BIOS.

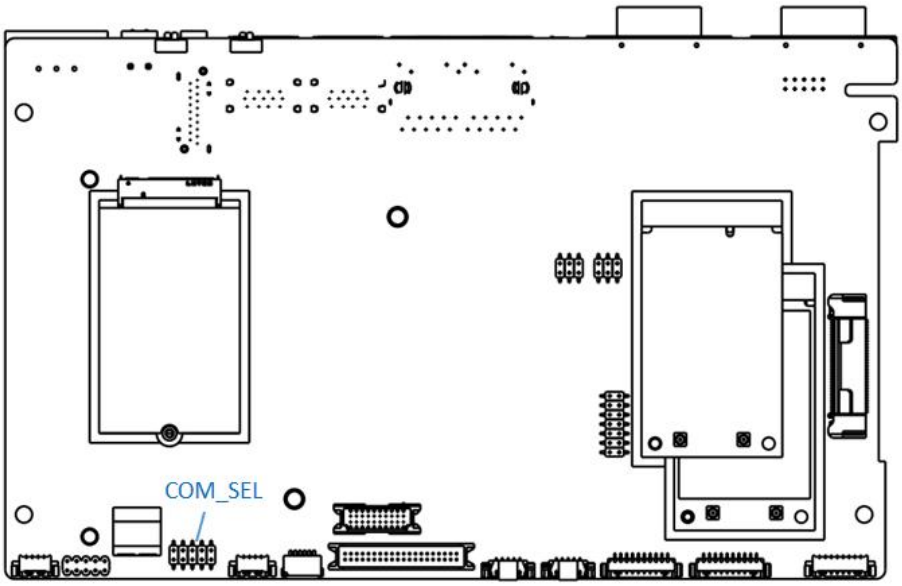


Figure 2.6

Table 2.1: COM_SEL mode selection		
	Mode	Position of jumper cap
COM1	RS232 (DEF)	1-x 3-4

	RS422	1-x 3-x
	RS485	1-2 3-x
COM2	RS232 (DEF)	5-x 7-8
	RS422	5-x 7-x
	RS485	5-6 7-x

2.3 I/O Introduction and Pin Assignments

2.3.1 Ethernet port（LAN2）

ALAD-K1550T(P) is equipped with 2*Intel I226V through two RJ45 interfaces, supports 10M/100M/1000M rate self-adaption. Table 2.2 is a detailed pin assignment introduction.

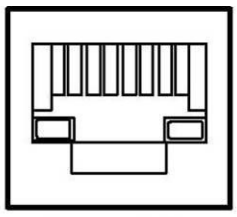


Figure 2.7 Ethernet port

Table 2.2: RJ-45 Port Pin Assignments	
pin	10/100/1000BaseT signal
1	TX+(10/100), LAN_DA+(GHz)
2	TX-(10/100), LAN_DA-(GHz)
3	RX+(10/100), LAN_DB+(GHz)
4	LAN_DC+(GHz)
5	LAN_DC-(GHz)

6	RX-(10/100), LAN_DB-(GHz)
7	LAN_DD+(GHz)
8	LAN_DD-(GHz)

Table 2.3 shows the connection rate represented by the network port LED.

Table 2.3: RJ-45 Led display		
Type	Left LED	Right LED
LED color	Green/Orange	Green /Yellow
10 M cable	Green quick blink	OFF
100M cable	Green blink	OFF
1000M cable	Green blink	Yellow light
2.5G cable	Orange blink	Green blink

2.3.2 Power Input Connector (DC-IN)

ALAD-K1550T(P) provides wide voltage (9~36V) power input through a 3pin, 3.81mm terminal. Table 2.4 provide detailed pin assignment introduction.

Figure 2.8 DC port

Table 2.4:DC-IN Port Pin Assignments			
Pin	Signal	Pin	Signal
1	9~36V	2	NC
3	GND		

2.3.3 CMOS battery（BAT1）

ALAD-K1550T(P) provides CMOS battery interface through 1*2pin, 1.25mm terminal, the interface pin definition is as follows.

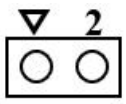


Figure 2.9 CMOS battery

Table 2.5：CMOS battery Port Pin Assignments			
Pin	Signal	Pin	Signal
1	BAT+	2	GND

2.3.4 8-bit DIO（J_GPIO）

ALAD-K1550T(P) provides a 8-bit DIO via a 2*5Pin connector, which can be configured I/O by setting the BIOS. Detailed pin assignment is shown in Table 2.6.

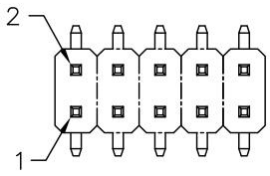


Figure 2.10 8-bit DIO

Table 2.6: 8-bit DIO Port Pin Assignments			
Pin	Signal	Pin	Signal
1	+5V	2	GP74
3	GP70	4	GP75
5	GP71	6	GP76
7	GP72	8	GP77
9	GP73	10	GND

2.3.5 F_PANEL port (F_PANEL)

ALAD-K1550T(P) provides a F_PANEL via a 2*5Pin connector. Table 2.7 describes pin assignment in detail.

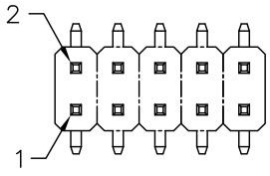


Figure 2.11

Table 2.7：F_PANEL Port Pin Assignments			
Pin	Signal	Pin	Signal
1	HDD_LED+	2	PWE_LED+
3	HDD_LED-	4	PWR_LED-

5	GND	6	PWR_SW
7	USB2_VCC	8	USB2_D-
9	USB2_D+	10	GND

2.3.6 USB port（USB32_1_2/USB32_3_4/USB2_1）

ALAD-K1550T(P) provides 4*USB3.2 Type A through 2 double-layer connectors. Table 2.8 shows the detailed pin assignment of USB3.2 Type A interface：

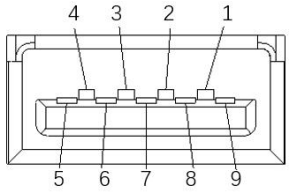


Figure 2.12 USB3.2 Type A

Table 2.8：USB3.2 type A Port Pin Assignments			
Pin	Signal	Pin	Signal
1	VBUS	6	RX0+
2	D-	7	GND
3	D+	8	TX0-
4	GND	9	TX0+
5	RX0-	Shell	Shield

Table 2.9 shows the detailed pin assignment of USB2.0：

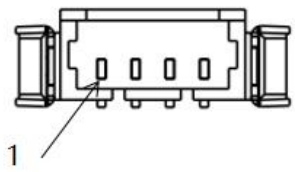


Figure 2.13 USB2.0接口

Table 2.9: USB2.0 Port Pin Assignments	
Pin	Signal
1	VCC
2	D-
3	D+

4	GND

2.3.7 COM ports (COM1/COM2/COM3 /COM4)

COM1/2 is a 2*D-sub 9-pin connector, and COM3/4 has two built-in 1*10Pin pins that can be wired to the panel. COM1/2 can be configured to RS232, RS422, or RS485 through BIOS Settings. The COM3/4 is configured as RS232.

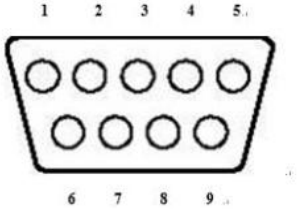


Figure 2.14 COM1/2 port

Table 2.12: COM1/2 Port Pin Assignments			
pin	RS-232 signal	RS-422 signal	RS-485 signal
1	DCD	TX-	DATA-
2	RxD	TX+	DATA+
3	TxD	RX+	NC
4	DTR	RX-	NC
5	GND	GND	GND
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC

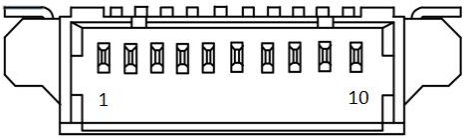


Figure 2.15 COM3/4 port

COM3/4 is a three-wire signal. Detailed pin assignment is shown in the table below.

Table 2.11：COM3/4 port Pin Assignments			
Pin	Signal	Pin	Signal
1	NC	6	NC
2	RxD	7	NC
3	TxD	8	NC

4	NC	9	NC
5	GND	10	NC

2.3.8 HDMI（HDMI）

The front panel of ALAD-K1550T(P) provides a high-resolution HDMI display interfaces, the highest resolution supported can reach 4096 x 2304@60Hz, Table 2.12 is the detailed pin assignment introduction。

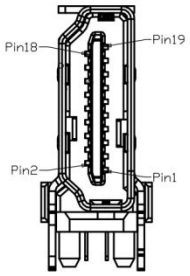


Figure 2.16 HDMI port

Table 2.12: HDMI Port Pin Assignments

Pin	Signal	Pin	Signal	Pin	Signal
1	DATA2_P	8	GND	15	SCL
2	GND	9	DATA0_N	16	SDA
3	DATA2_N	10	CLK_P	17	GND
4	DATA1_P	11	GND	18	VCC
5	GND	12	CLK_N	19	DETECT
6	DATA1_N	13	NC		
7	DATA0_P	14	NC		

2.3.9 LVDS（LVDS）

ALAD-K1550T(P) provides a 2*20pin 48-Bit LVDS. The pin assignments are as follows.

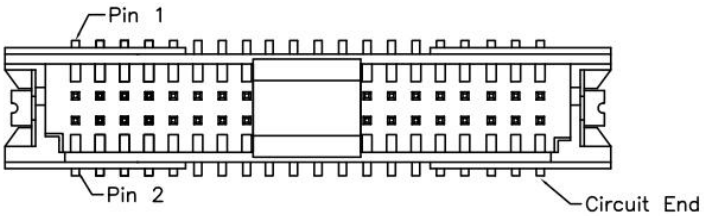


Figure 2.17

Table 2.13：LVDS Pin Assignments

Pin	Signal	Pin	Signal
1	LVDS_DET#_SC56	2	GND
3	LVDS_DA_P3	4	LVDS_DB_P3
5	LVDS_DA_N3	6	LVDS_DB_N3
7	GND	8	GND
9	LVDS_DA_P2	10	LVDS_DB_P2
11	LVDS_DA_N2	12	LVDS_DB_N2
13	GND	14	GND
15	LVDS_DA_P1	16	LVDS_DB_P1
17	LVDS_DA_N1	18	LVDS_DB_N1
19	GND	20	GND
21	LVDS_DA_P0	22	LVDS_DB_P0
23	LVDS_DA_N0	24	LVDS_DB_N0
25	GND	26	GND
27	LVDS_CLKA_P	28	LVDS_CLKB_P
29	LVDS_CLKA_N	30	LVDS_CLKB_N
31	GND	32	GND
33	NC	34	NC
35	NC	36	NC
37	VDD_PANEL	38	VDD_PANEL
39	VDD_PANEL	40	VDD_PANEL

2.3.10 LVDS backlight port（LVDS_BLK）

ALAD-K1550T(P) provides a 5-pin LVDS backlight control interface. Detailed pin allocation is described below.

Figure 2.18

Table 2.14：LVDS backlight Pin Assignments

Pin	Signal	Pin	Signal
1	+V12	2	GND

3	BKL_EN	4	LVDS_BKLADJ
5	+V5		

2.3.11 eDP（eDP）

ALAD-K1550T(P) provides a 2*10pin eDP. The pin assignments are as follows.

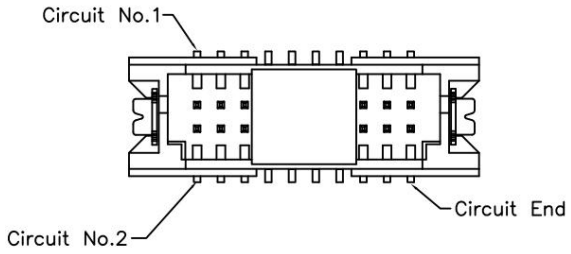


Figure 2.19

Table 2.13：eDP Pin Assignments

Pin	Signal	Pin	Signal
1	/	11	PANEL_TXP1
2	/	12	PANEL_AUXN
3	PANEL_TXN0	13	GND
4	PANEL_TXN3	14	PANEL_AUXP
5	PANEL_TXP0	15	PANEL_TXN2
6	PANEL_TXP3	16	GND
7	GND	17	PANEL_TXP2
8	/	18	HPD
9	PANEL_TXN1	19	VDD_PANEL
10	GND	20	VDD_PANEL

2.3.12 eDP backlight port（EDP_BLK）

ALAD-K1550T(P) provides a 5-pin eDP backlight control interface. Detailed pin allocation is described below.

Figure 2.18

Table 2.14： eDP backlight Pin Assignments			
Pin	Signal	Pin	Signal
1	+V12	2	GND
3	BKL_EN	4	LVDS_BKLADJ
5	+V5		

2.3.13 Amplifier接口（AMP1）

ALAD-K1550T(P) internal board provides a Speaker out connector for connecting passive speakers.

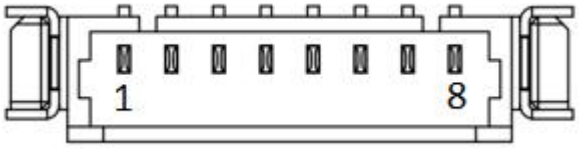


Figure 2.21 Speaker port

The following table describes pin assignment in detail.

Table 2.17： Amplifier Pin Assignments			
Pin	Signal	Pin	Signal
1	SPK_OUT_LP	2	SPK_OUT_LP
3	SPK_OUT_LN	4	SPK_OUT_LN
5	SPK_OUT_RN	6	SPK_OUT_RN
7	SPK_OUT_RP	8	SPK_OUT_RP

2.3.14 Line out (AUD1)

ALAD-K1550T(P) probides 1 Line-out connector.

Figure 2.22 AUD1

2.3.15 F_AUDIO (FP_AUDIO1)

ALAD-K1550T(P) provides a 2*5Pin audio pin interface internally. The following table shows

specific pin assignments.

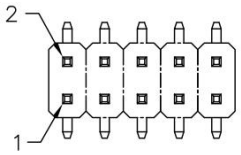


Figure 2.23

Table 2.18：F_AUDIO Pin Assignments			
Pin	Signal	Pin	Signal
1	MCIN1_L	2	GND_AUD
3	MCIN1_R	4	LINE OUT_R
5	LINE IN_R	6	GND_AUD
7	GND_AUD	8	LINE OUT_L
9	LINE IN_L	10	GND_AUD

2.3.16 Mic (MIC)

ALAD-K1550T(P) provides a Mic.

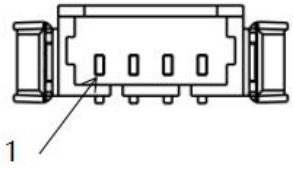


Figure 2.24 Mic

Detailed pin assignment is described in the table below.

Table 2.19：MIC Pin Assignments			
Pin	Signal	Pin	Signal
1	MCIN2_L	2	GND
3	MCIN2_R	4	MIC2_JD

2.3.17 Capacitive touch screen control interface (J_TSC1)

ALAD-K1550T(P) provides a 6-pin capacitive touch screen control interface. Detailed pin assignment is described in the table below.

Figure 2.25

Table 2.20：Pin Assignments			
Pin	Signal	Pin	Signal
1	+V5SB	2	USB2_0-
3	USB2_0+	4	GND
5	NC	6	NC

2.3.18 Remote SW（PWR_BTN1）

ALAD-K1550T(P) provides a 1*2pin remote switch，Detailed pin assignment is described in the table below：

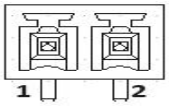


Figure 2.26

Table 2.21：Remote SW Pin Assignments			
Pin	Signal	Pin	Signal
1	PWR_SW	2	GND

2.3.19 12V Power terminal（12V_OUT）

ALAD-K1550T(P) provides a 1*2pin power terminal inside. When the power consumption of the external device is high, the child card has a deresistance version. In this case, the terminal supplies power to the external device.

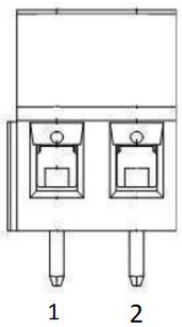


Figure 2.27

Table 2.22：12V_OUT Pin Assignments

Pin	Signal	Pin	Signal
1	12V	2	GND

2.3.20 SM Bus (SMB1)

ALAD-K1550T(P) provides a 4Pin SM Bus, Detailed pin assignment is described in the table below.

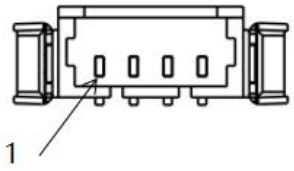


Figure 2.28 SM Bus

Table 2.23：SMB Pin Assignments			
Pin	Signal	Pin	Signal
1	GND	2	DAT
3	CLK	4	+V3.3

2.3.21 Reset

ALAD-K1550T(P) provides a RESET port.

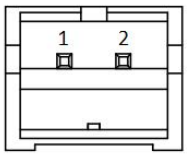


Figure 2.29 Reset

Table 2.24：Reset Pin Assignments			
Pin	Signal	Pin	Signal
1	SYS_RST#	2	GND

2.3.22 SATA（S_SATA1）

ALAD-K1550T(P) provides a 7+15pin SATA port. Detailed pin assignment is described in the table below：

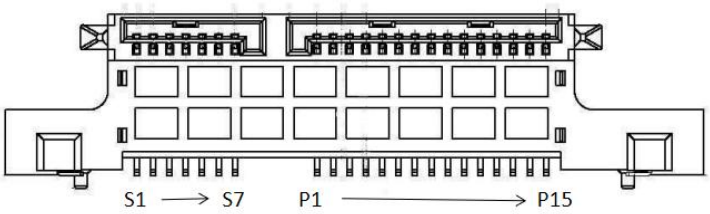


Figure 2.30 7+15pin SATA port

Table 2.25：7+15pin SATA Port Pin Assignments			
Pin	Signal	Pin	Signal
S1	GND	S2	TX+
S3	TX-	S4	GND
S5	RX-	S6	RX+
S7	GND		
P1	+3.3V	P2	+3.3V
P3	+3.3V	P4	GND
P5	GND	P6	GND
P7	+5V	P8	+5V
P9	+5V	P10	GND
P11	optional	P12	GND
P13	+12V	P14	+12V
P15	+12V		

2.3.23 mSATA (MSATA1)

ALAD-K1550T(P) provides a mSATA port. Detailed pin assignment is described in the table below：

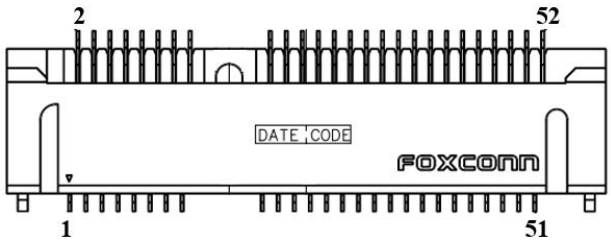


Figure 2.31 mSATA

Table 2.26: mSATA Pin Assignments			
Pin	Signal	Pin	Signal

1	NC	2	+V3.3
3	NC	4	GND
5	NC	6	+V1.5
7	NC	8	LPC_FRAME#
9	GND	10	LPC_AD3
11	NC	12	LPC_AD2
13	NC	14	LPC_AD1
15	GND	16	LPC_AD0
17	PLTRST#	18	GND
19	LPC_CLK1	20	NC
21	GND	22	PLTRST#
23	SATA1_mSATA_z_RX+	24	+V3.3
25	SATA1_mSATA_z_RX-	26	GND
27	GND	28	+V1.5
29	GND	30	SMB_SCL
31	SATA1_mSATA_z_TX-	32	SMB_SDA
33	SATA1_mSATA_z_TX+	34	GND
35	GND	36	NC
37	GND	38	NC
39	+V3.3	40	GND
41	+V3.3	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	+V1.5
49	NC	50	GND
51	NC	52	+V3.3

2.3.24 mini-PCIe (MPE1)

ALAD-K1550T(P) provides a Mini PCIe slot, PCIeX1+USB2.0 signal, and CAN be expanded with 4G LTE or network port, CAN port and other function modules. Pin allocation is as follows:

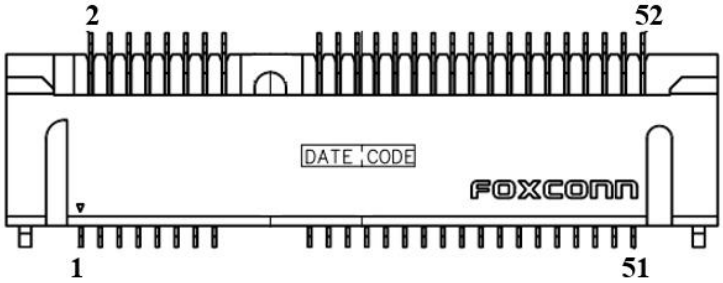


Figure 2.32

Table 2.27: Mini PCIe Pin Assignments

Pin	Signal	Pin	Signal
1	PCIE_WAKE_N	2	+V3.3_MINICARD
3	NC	4	GND
5	NC	6	+V1.5
7	CLKREQ#	8	+VUIM_PWR
9	GND	10	UIM_DATA
11	CLK_PCIE-	12	UIM_CLK
13	CLK_PCIE+	14	UIM_RESET
15	GND	16	+VUIM_VPP
17	NC	18	GND
19	NC	20	WIFI2_DISABLE#
21	GND	22	PLTRST#
23	PCIE_MIO_RX-	24	+V3.3_MINICARD2
25	PCIE_MIO_RX+	26	GND
27	GND	28	+V1.5
29	GND	30	SMB_SCL_RSM
31	PCIE_MIO_TX-	32	SMB_SDA_RSM
33	PCIE_MIO_TX+	34	GND
35	GND	36	USB_HUB_P-
37	GND	38	USB_HUB_P+
39	+V3.3_MINICARD	40	GND
41	+V3.3_MINICARD	42	NC
43	GND	44	SIM_DET
45	NC	46	NC
47	NC	48	+V1.5
49	NC	50	GND
51	NC	52	+V3.3_MINICARD

2.3.25 M.2 B-Key 3052 (BKEY1)

ALAD-K1550T(P) provides an M.2 B-Key 3042/3052 with a PCIe/USB signal that connects to the SIM card slot. Table 2.20 shows the specific pin allocation.

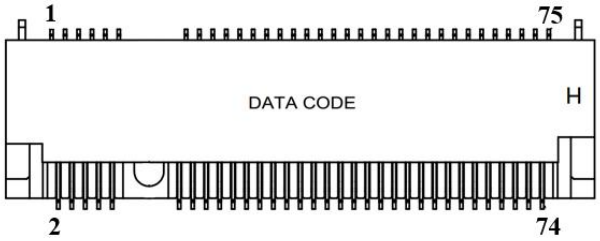


Figure 2.33 M.2 B-Key slot

Table 2.28：M.2 B-Key 3042/3052 Pin Assignments

Pin	Signal	Pin	Signal
1	GND	2	+V3_M2
3	GND	4	+V3_M2
5	GND	6	+V3_M2
7	USB_P9	8	WIFI_DISABLE
9	USB_N9	20	NC
21	+V3_M2	22	NC
23	NC	24	NC
25	NC	26	NC
27	GND	28	NC
29	NC	30	SIM2_RESET
31	NC	32	SIM2_CLK
33	GND	34	SIM2_DATA
35	NC	36	SIM2_PWR
37	NC	38	SSD_SATA5_DEVSLP
39	GND	40	NC
41	PCIE_RX-	42	NC
43	PCIE_RX+	44	NC
45	GND	46	NC
47	PCIE_TX-	48	NC
49	PCIE_TX+	50	PLTRST_M2_N
51	GND	52	CLK_REQ15#
53	CLK_PCIe_N	54	PCH_WAKE_N
55	CLK_PCIe_P	56	NC

57	GND	58	NC
59	NC	60	NC
61	NC	62	NC
63	NC	64	NC
65	NC	66	SIM_DET
67	+3VS	68	SUSCLK
69	M.2_SSD_PEDET	70	+V3_M2
71	GND	72	+V3_M2
73	GND	74	+V3_M2
75	NC		

2.4 Installation

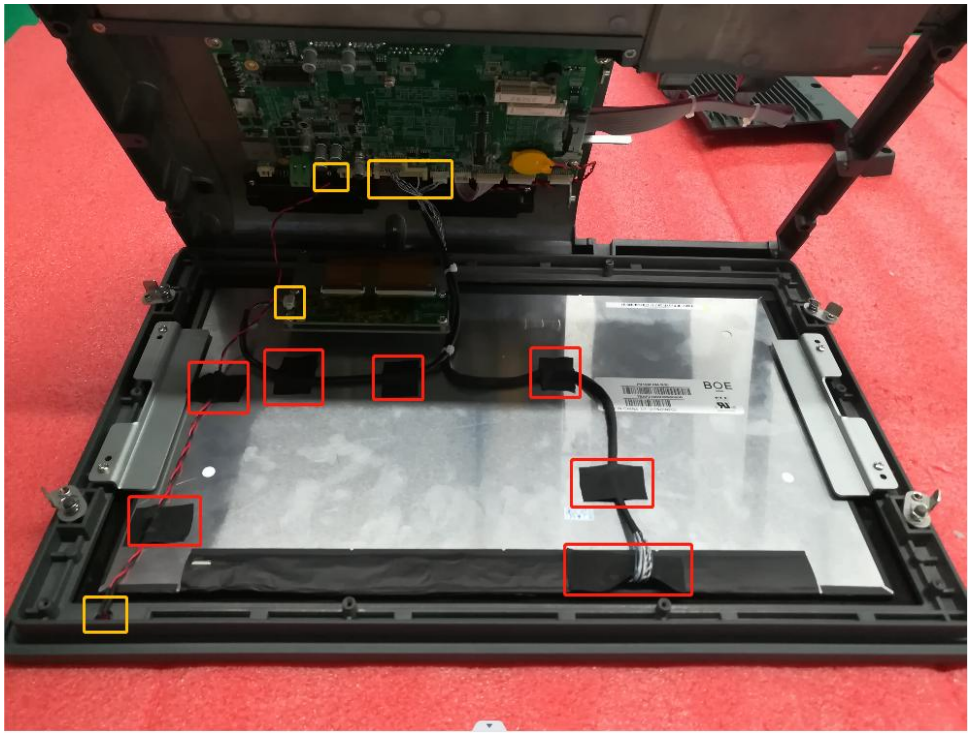
This section describes how to install Mini PCIe, mSATA, M.2 B-Key 3052 (BKEY1), and HDD/SSD modules.

2.4.1 Mini PCIe installation

Step 1: Remove the back frame and unscrew the 12 screws on the back cover (as shown in the red area in the picture);

picture2.4.1

Step 2: Gently tear off the black tape on the rear panel of the screen (red area in the figure below), and then gently pull out the LED connection cable and EDP connection cable on the screen panel and the motherboard (yellow area in the figure below).

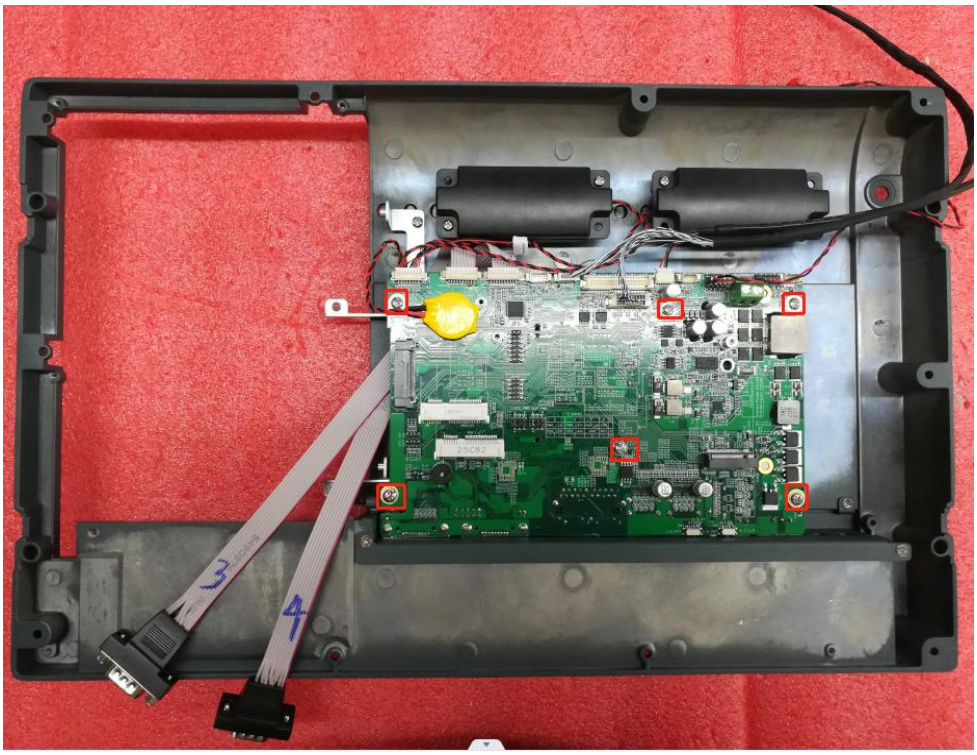


picture2.4.2

Step 3: After removing the screen, you can see that the back cover is embedded with the motherboard and the carrier board (the lower part is the carrier board, the upper part is the motherboard), unscrew the two screws fixing the motherboard (the red box in the figure below), and then gently unplug the motherboard in the yellow area.

picture2.4.3

Step 4: After removing the mainboard, the carrier board as shown in the following figure is obtained. Then remove the interface cables around the carrier board and remove the six screws on the mainboard using a screwdriver (as shown in the red box).



picture2.4.4

Step 5: Align the slot of the Mini-PCIe module with the Mini-PCIe slot (red box in the following figure) and insert it into the slot at a 30-degree Angle.

picture2.4.5

Step 6: Use a screw to secure the Mini-PCIe module to the bracket.

Step 7: Complete the installation of the product by following the reverse dismantling steps.

2.4.2 mSATA installation

Step 1: same as "2.4.1 Steps 1, 2, 3, 4";

Step 2: Align the slot of the mSATA module with the mSATA slot on the board (red box in the following figure), and insert the slot at a 30 degree Angle.

picture2.4.6

Step 3: Attach the mSATA module to the bracket with a screw.

Step 4: Complete the installation of the product by following the reverse dismantling steps.

2.4.3 M.2 B-Key 3052 (BKEY1) installation

Step 1: same as "2.4.1 Steps 1, 2, 3, 4";

Step 2: Align the slot of the M.2 B-Key 3052 (BKEY1) module with the M.2 B-Key slot (red box in the following figure) and insert it into the slot at a 30 degree Angle.

picture2.4.7

Step 3: Attach the M.2 B-Key 3052 (BKEY1) module to the bracket with a screw.

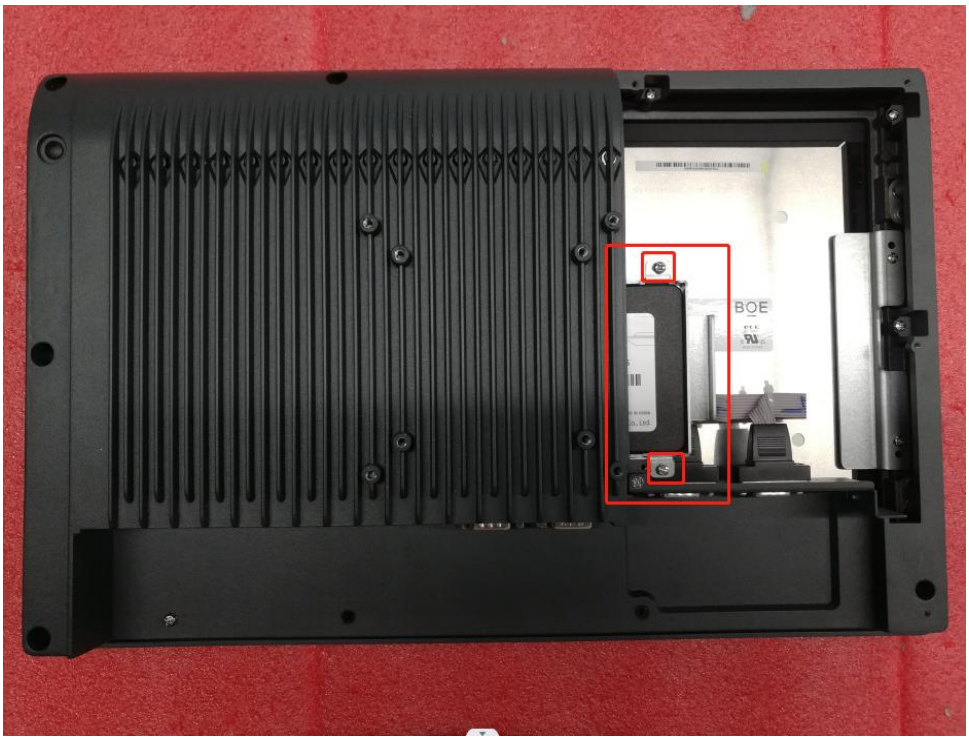
Step 4: Complete the installation of the product by following the reverse dismantling steps.

2.4.4 HDD or SSD installation

Step 1: Fix the hard disk on the bracket, and lock the four screws;

picture2.4.8

Step 2: Install the computer according to steps 1, 2, 3, and 4 in 2.4.1. Insert the hard disk in the red area in the corresponding direction. Finally, use a screwdriver to lock the two screws on the side.



picture2.4.9

Step 3: Follow the steps to complete the installation of the product.

CHAPTER 3

BIOS Setup

3.1 BIOS Description

BIOS is the communication bridge between hardware and software. How to correctly set the BIOS parameters is crucial for the system to work stably and whether the system works at its best.

This chapter describes how to change the system settings through the BIOS settings.

Note: For the purpose of better product maintenance, the manufacture reserves the right to change the BIOS items presented in this manual. The BIOS setup screens shown in this chapter are for reference only and may differ from the actual BIOS.

You need to make SETUP settings as follows:

1. An error message appears on the screen during the system self-test and asks for the SETUP setting.

2. You want to change the factory default settings based on customer characteristics.

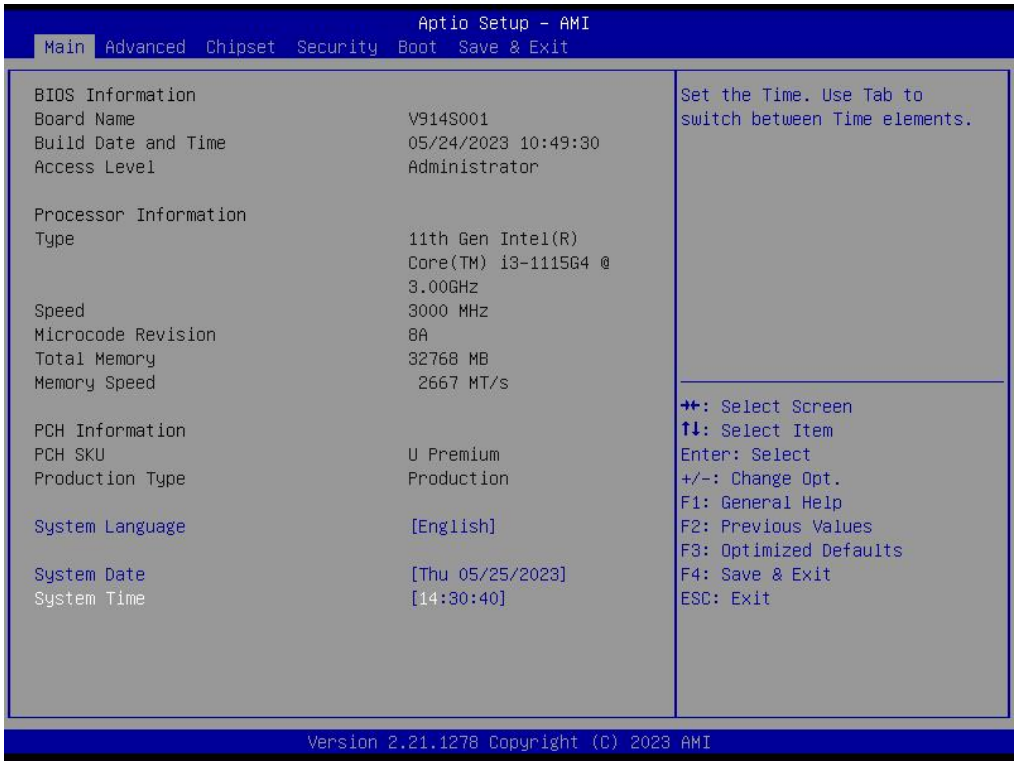
(But in general, customers are not recommended to set it up. In most cases, using the default value is already the best setting.)

The BIOS Setup Utility enables you to configure:

- Hard drives, diskette drives and peripherals
- Video display type and display options
- Password protection from unauthorized use
- Power Management features

3.1.1 Entering the Setup Utility

When you power on the system, BIOS enters the Power-On Self-Test (POST) routines. POST is a series of built-in diagnostics performed by the BIOS. After the POST routines are completed, Press the "**DEL**" key to enter BIOS Setup Utility.



3.2 BIOS parameter settings

When you start the Setup Utility, the main menu appears. The main menu of the Setup Utility displays a list of the options that are available. A highlight indicates which option is currently selected. Use the cursor arrow keys to move the highlight to other options. When an option is highlighted, execute the option by pressing <Enter>.

Some options lead to pop-up dialog boxes that prompt you to verify that you wish to execute that option. Other options lead to dialog boxes that prompt you for information.

Some options (marked with a triangle ▶) lead to submenus that enable you to change the values for the option. Use the cursor arrow keys to scroll through the items in the submenu.

In this manual, default values are enclosed in parenthesis. Submenu items are denoted by a triangle ▶.

The default BIOS setting for this motherboard apply for most conditions with optimum performance. We do not suggest users change the default values in the BIOS setup and take no responsibility to any damage caused by changing the BIOS settings.

3.2.1 BIOS Navigation Keys

Enter the SETUP settings interface, The BIOS navigation keys are listed below:

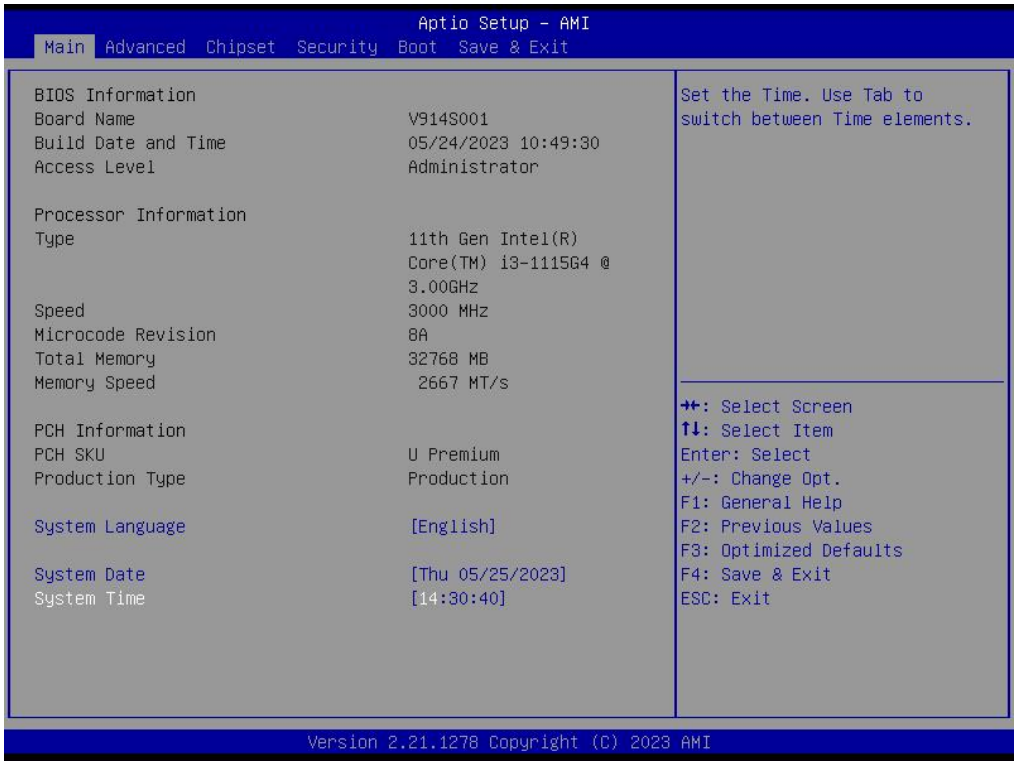
Table 3.1: The BIOS navigation keys

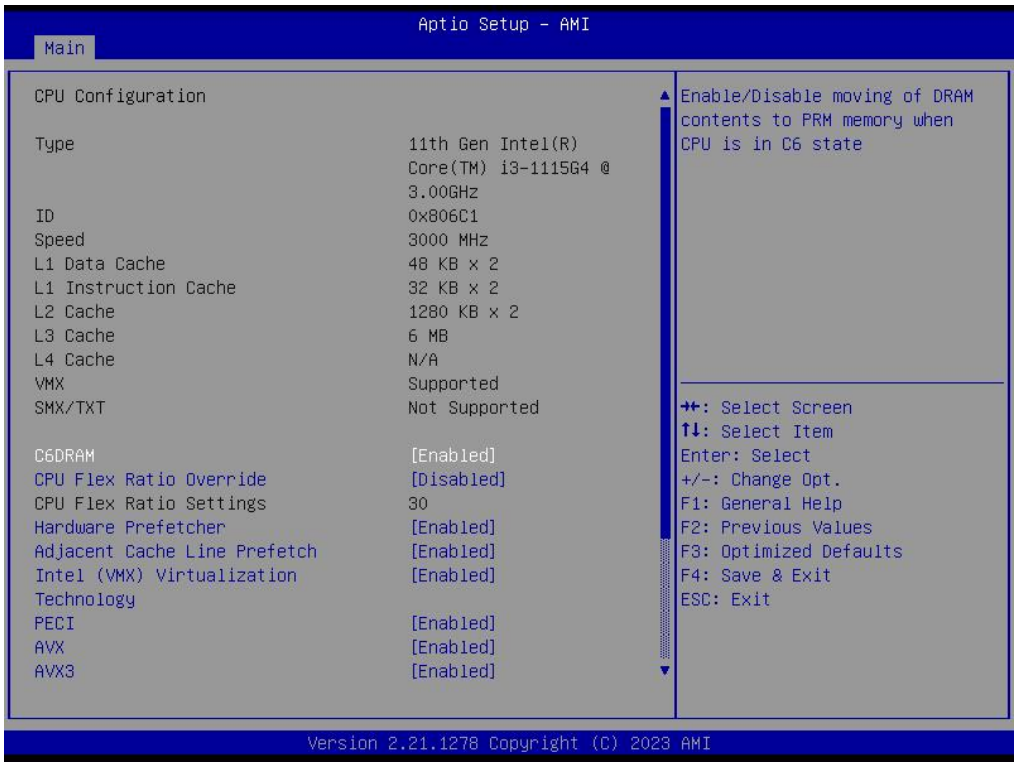
KEY	FUNCTION
ESC	Exit the current menu
↑↓→←	Scrolls through the items on a menu
+/-	Change Opt.
Enter	Select
F1	General Help
F2	Previous Values
F3	Optimized Defaults
F4	Save & Exit

3.2.2 Main Menu

When you enter the BIOS Setup program, the main menu appears, giving you an overview of the basic system information. Select an item and press <Enter> to display the submenu. Press <Esc> to back to the main menu.

The BIOS setup program provides a help screen. You can call up this help screen from any menu by simply pressing the <F1> key. This help screen lists the corresponding keys and possible selections. Press <Esc> to exit the help screen.





BIOS Vendor (American Megatrends)

This item shows the information of the BIOS vendor.

Core Version (5.13)

This item shows the information of the Core Version.

Project Version (V909S 0.01 X64)

This item shows the information of the motherboard Version.

Build Date and Time

This item shows the information of the BIOS build date and time

Processor Information

This item shows the basic information about the currently used processor, including name, type, speed.

IGFX VBIOS Version

This item shows the Current VBIOS version of the CPU integrated graphics.

Total Memory

This item shows the total memory size of the current motherboard.

Memory Frequency

This item shows the current memory operating frequency.

PCH Information

This item shows the basic information about PCH, including name, PCH SKU, etc.

System Language

Set the language interface of the BIOS.

System Date

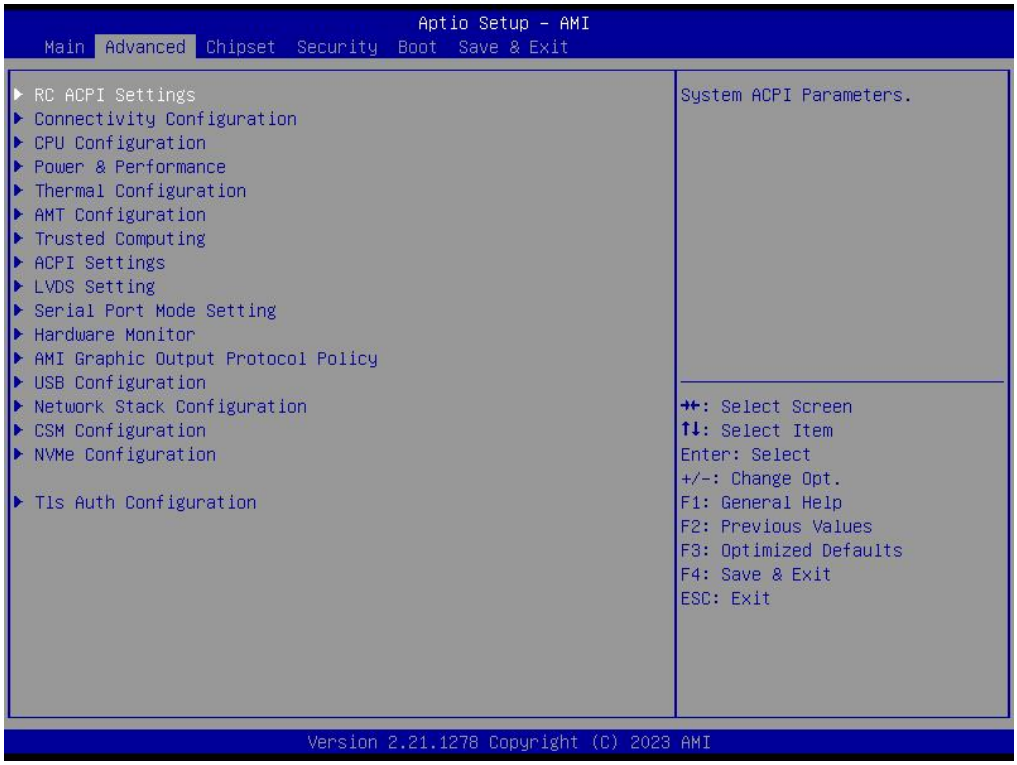
Set the date. The format of the date is <week><month><day><year>.

System Time

Set the time. The format of the time is <hour><minute><second>.

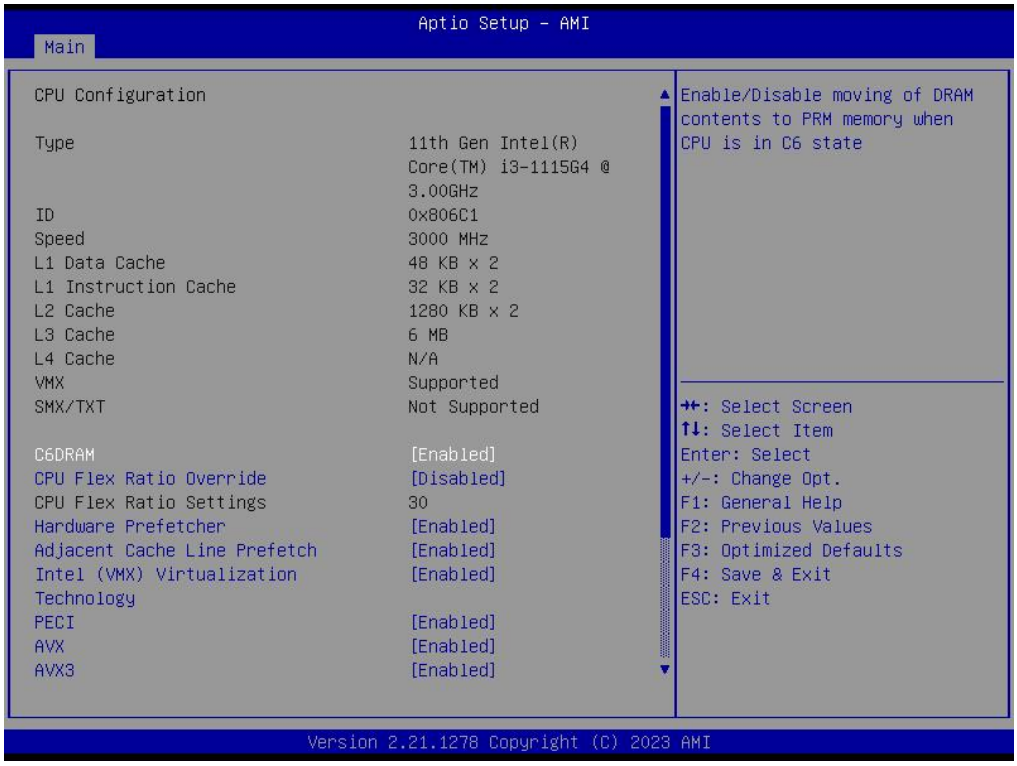
3.2.3 Advanced Menu

This page sets up more advanced information about your system. Handle this page with caution. Any changes can affect the operation of your computer.



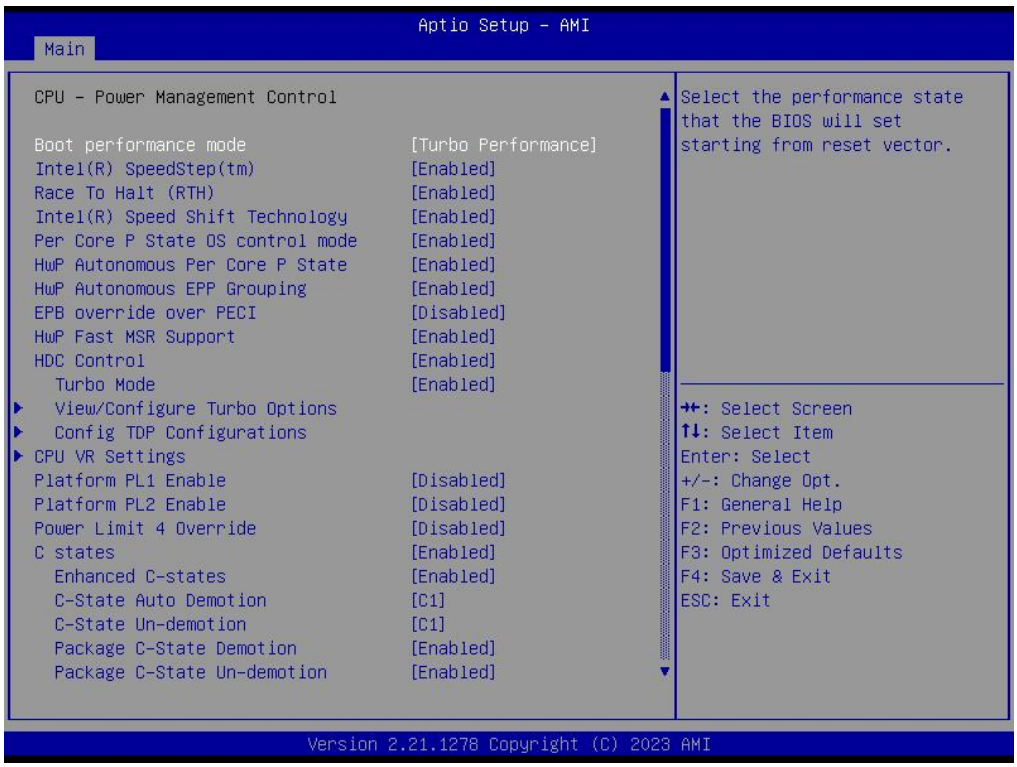
▶CPU Configuration

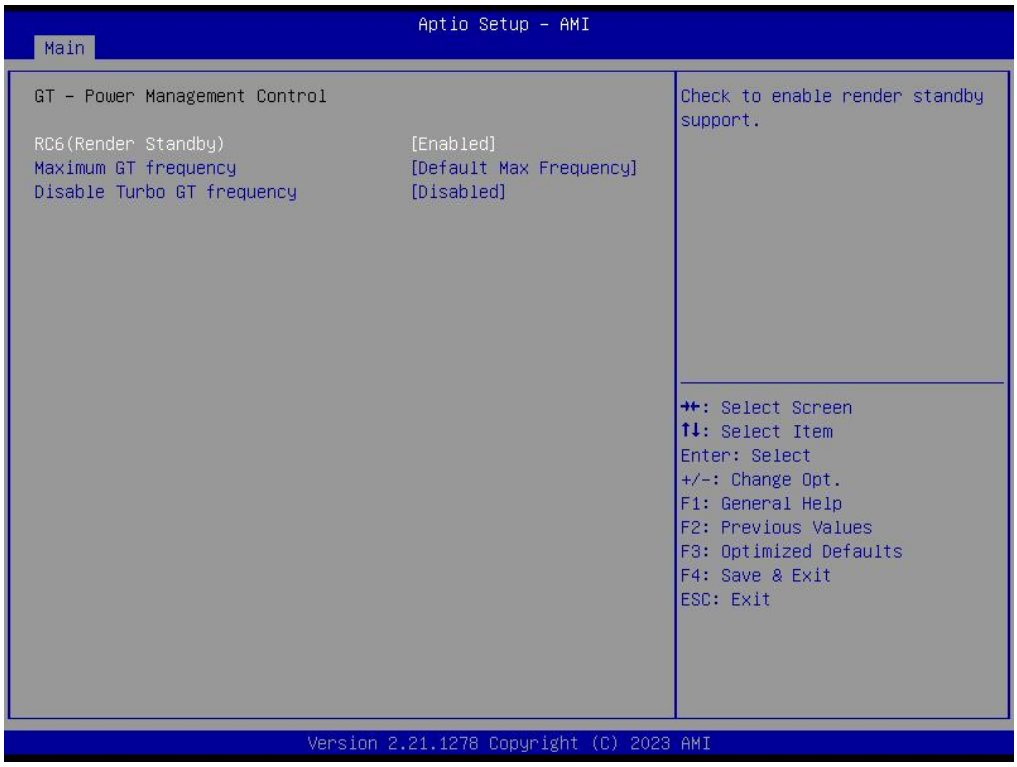
The configuration of the central processor, enter this sub-menu, there will be detailed details of the CPU, as well as various settings of the CPU.



▶Power & Performance

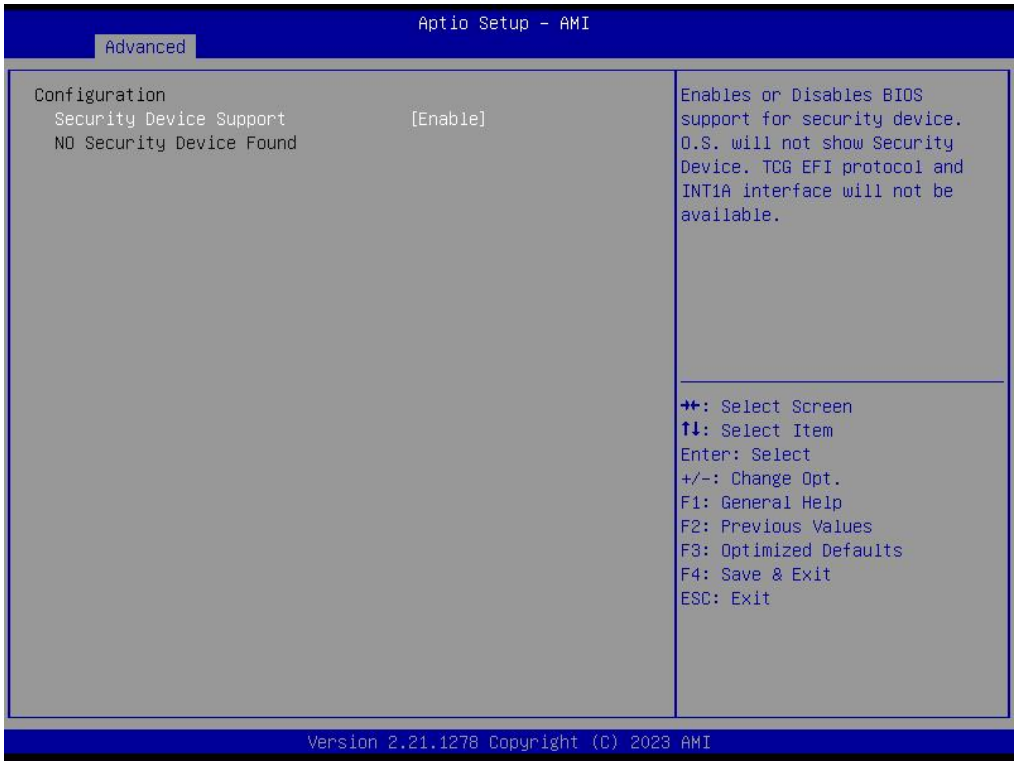
This item in the menu shows how to set the Power Management Control of CPU and GT.





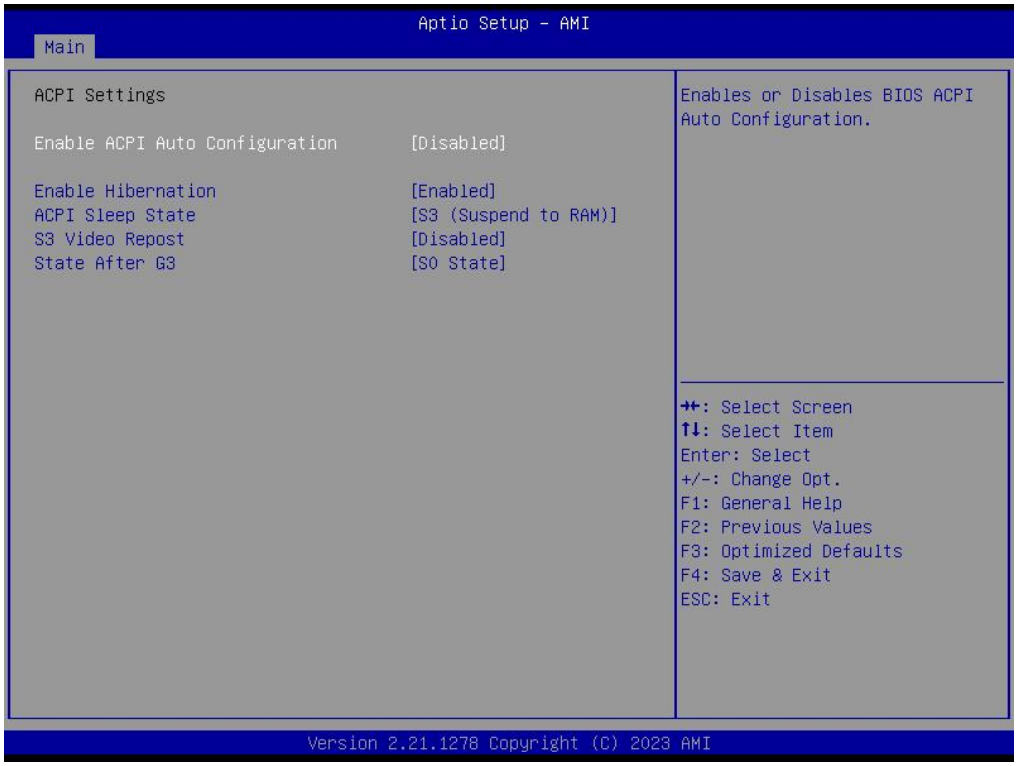
▶Trusted Computing

Trusted computing, enter this sub-menu, there will be the setting of the encryption security module (the motherboard will install the encryption module hardware will take effect)



▶ACPI Settings

Advanced configuration and power management interface settings, enter this submenu, there will be ACPI related settings.

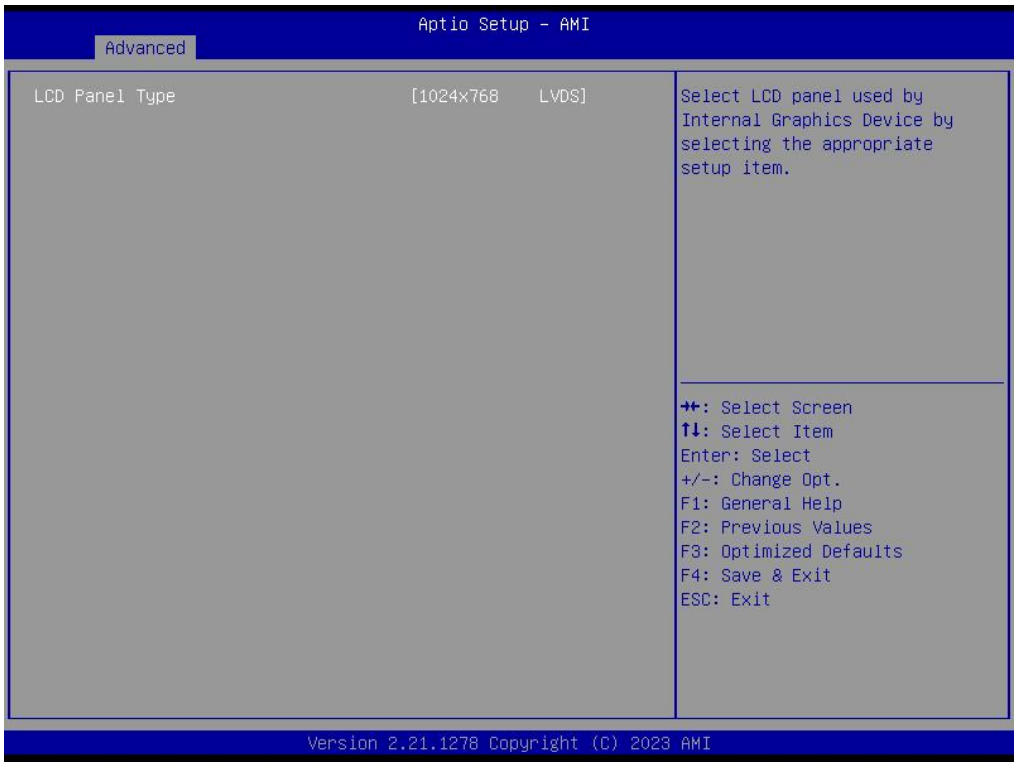


ACPI Sleep State (S3 (Suspend to RAM))

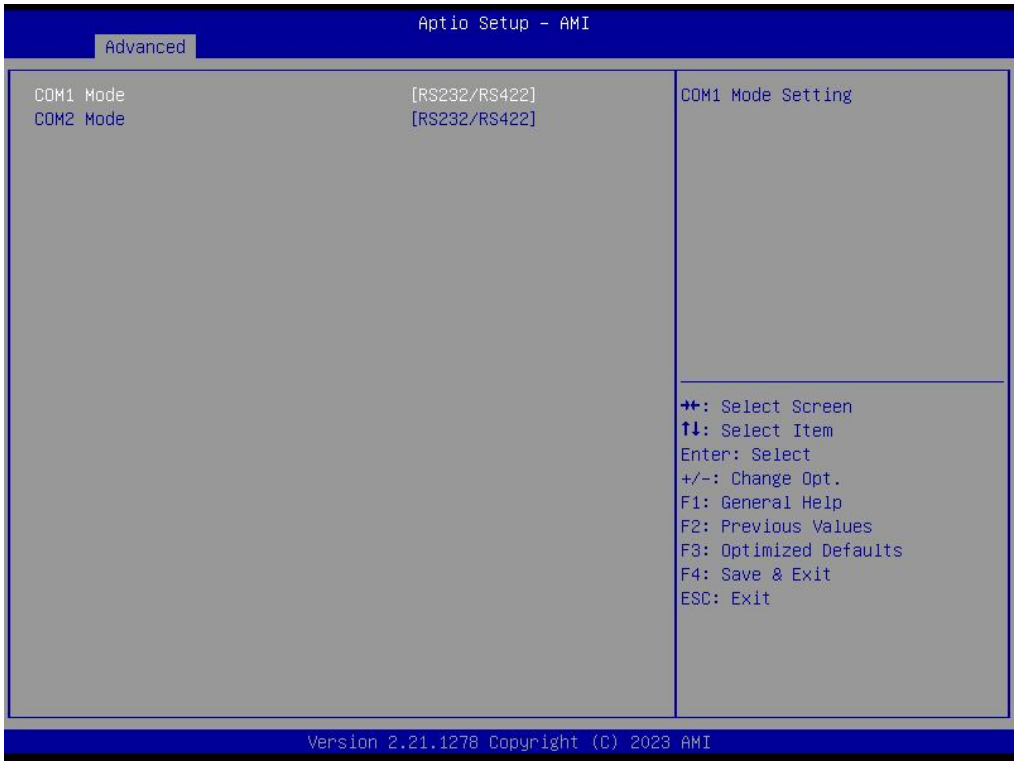
This item allows user to enter the ACPI S3 (Suspend to RAM) Sleep State (default).

Press <Esc> to return to the Advanced Menu page.

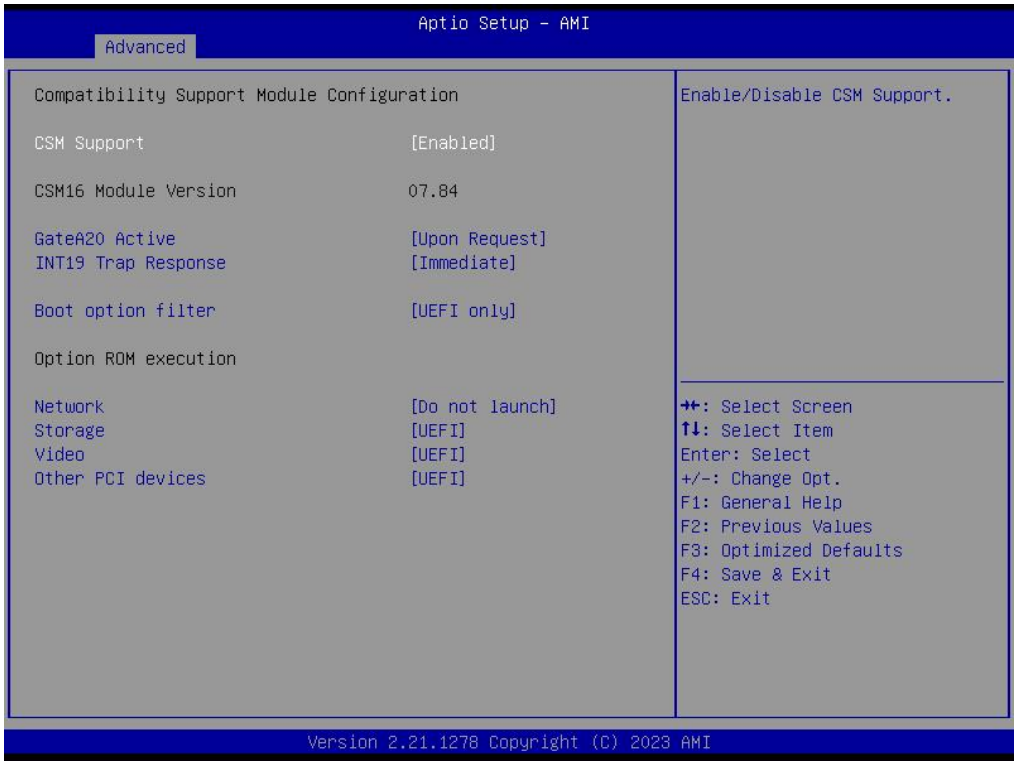
▸LCD Panel Type



▸Serials mode setting

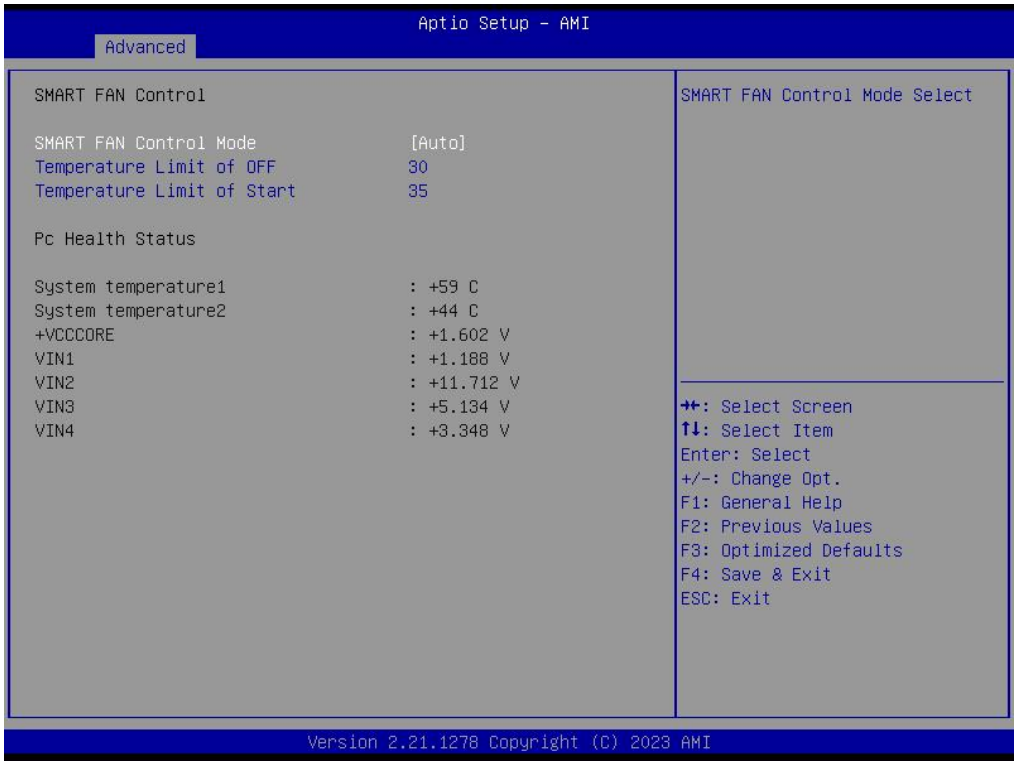


▸CSM support



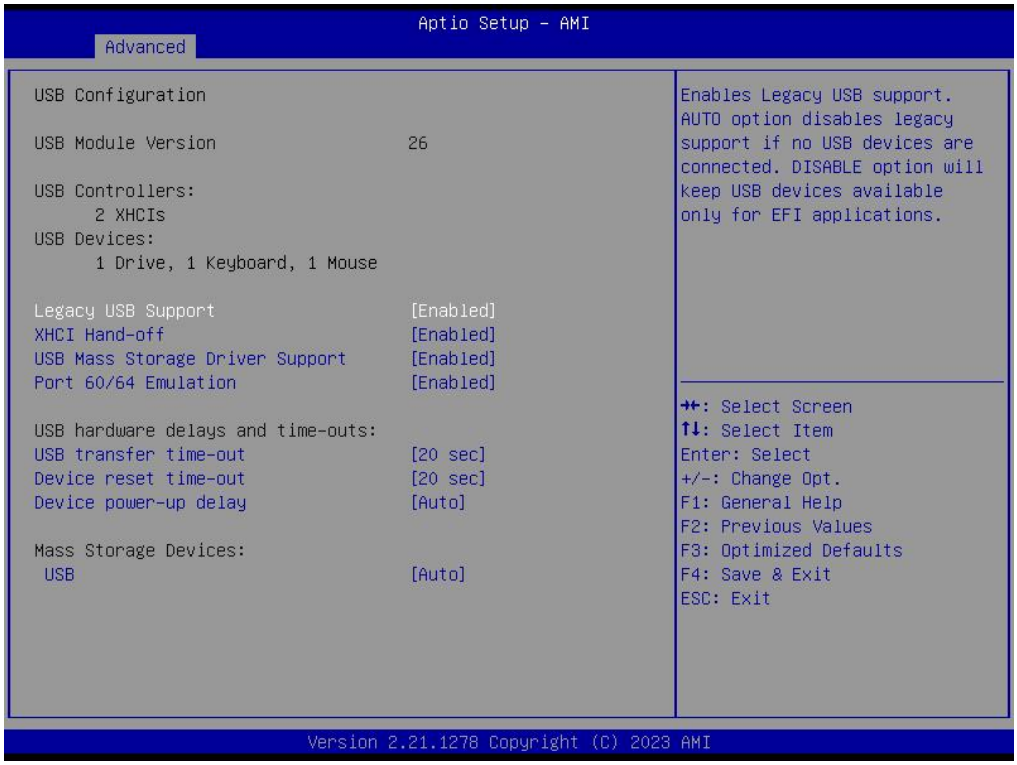
▶Hardware Monitor

Hardware monitoring, enter this sub-menu, there will be CPU temperature, System temperature, status display of each common working voltage.



▶USB Configuration

USB configuration, enter this sub-menu, there will be USB-related detailed settings.



Legacy USB Support

This item is used to set the USB interface support. If you need to support USB devices under DOS, such as U disk, USB keyboard, etc., set this item to [Enabled]. Otherwise, select [Disabled].

USB Mass Storage Driver Support

USB mass storage device support switch.

USB Transfer time-out

This item Sets the timeout period for control, batch, and interrupt transmission. The default is 20 seconds.

Device reset time-out

This item sets boot command timeout of the large capacity USB disk. The default is 20 seconds.

Device power-up delay

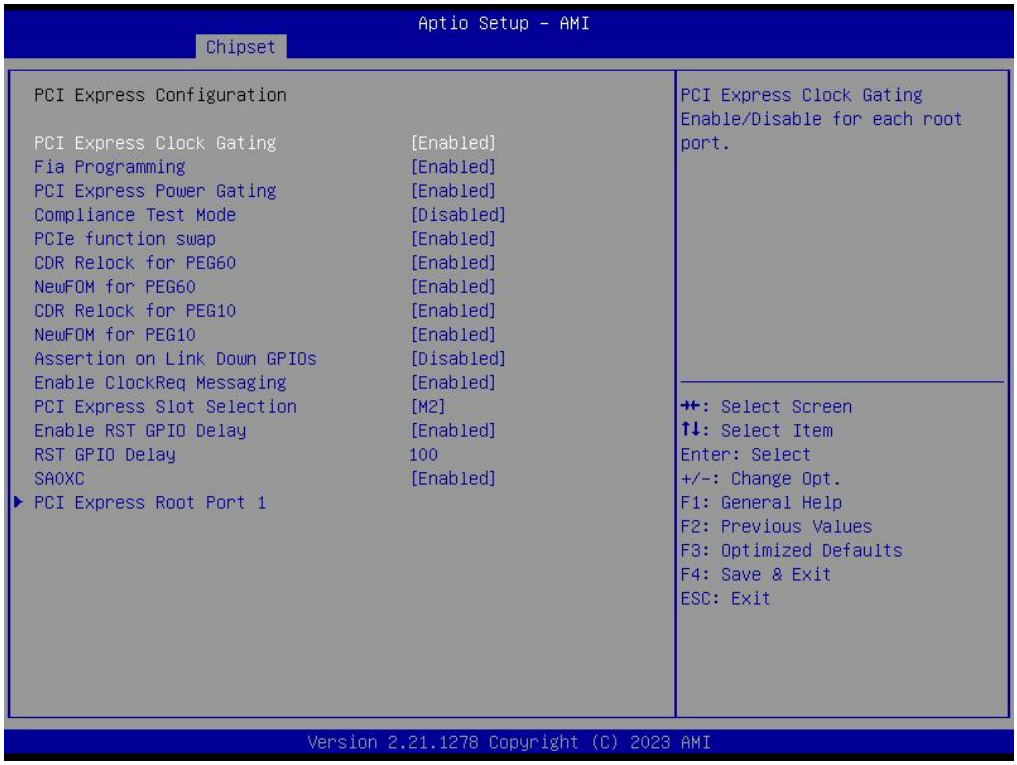
This item sets boot command delay of the large capacity USB disk. The default is Auto.

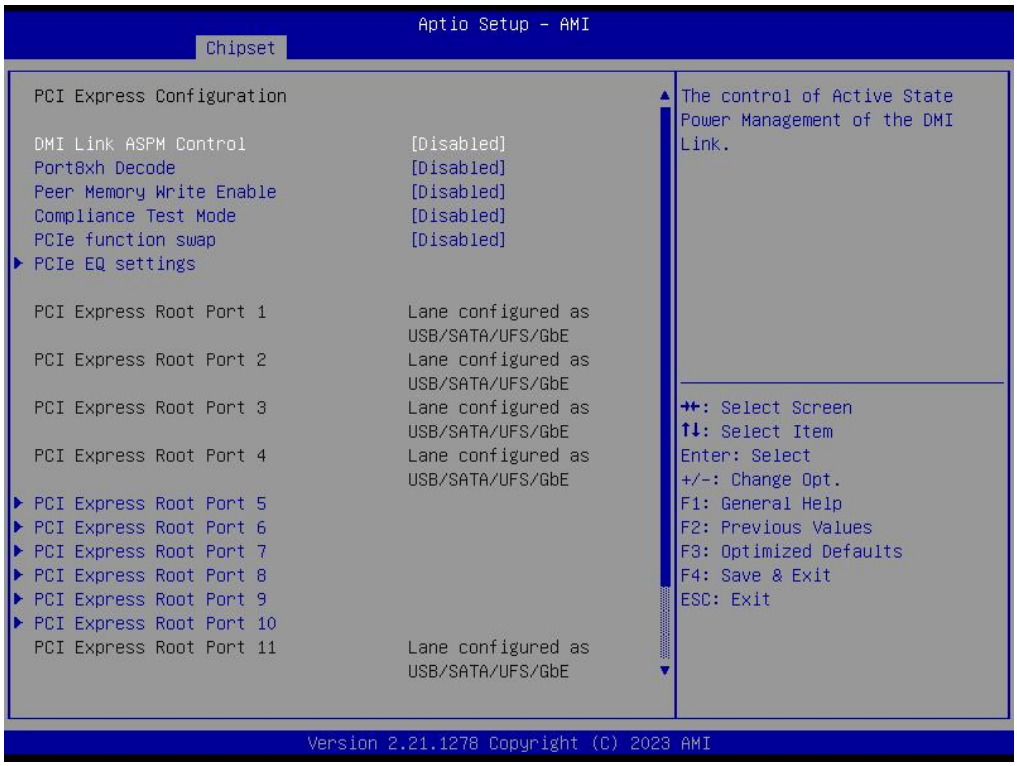
3.2.4 Chipset Menu

The chipset menu items allow you to change the settings for the North Bridge chipset, South Bridge chipset and other system.

PCH-IO Configuration (South Bridge Configuration)

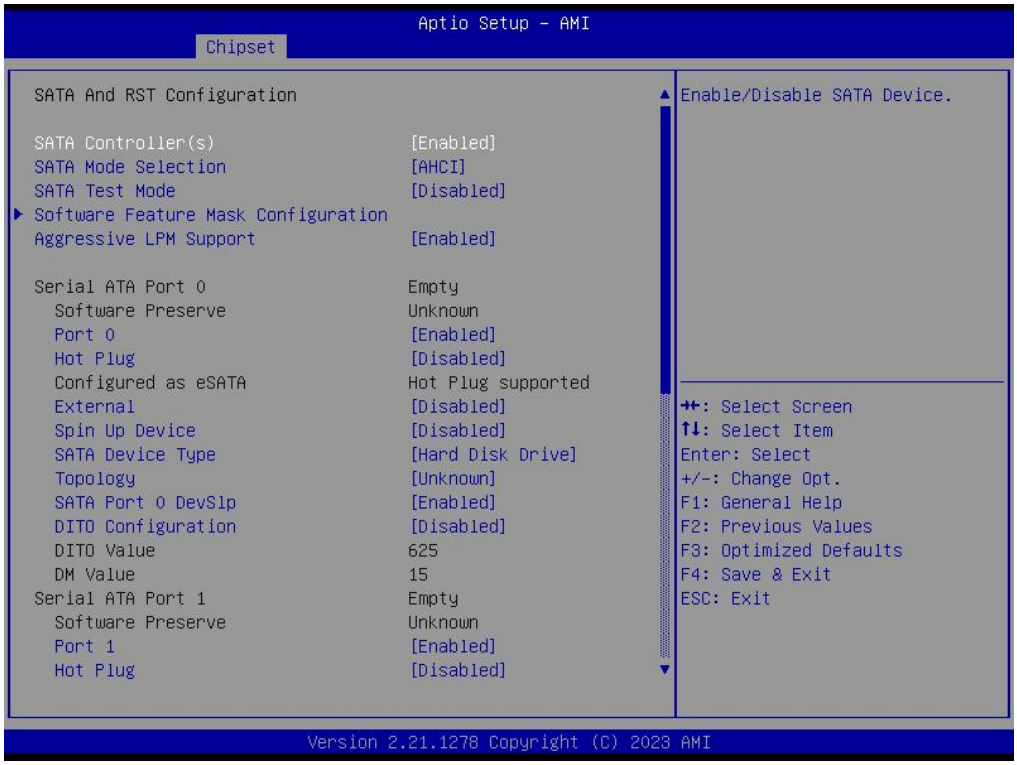
▶PCI Express Configuration



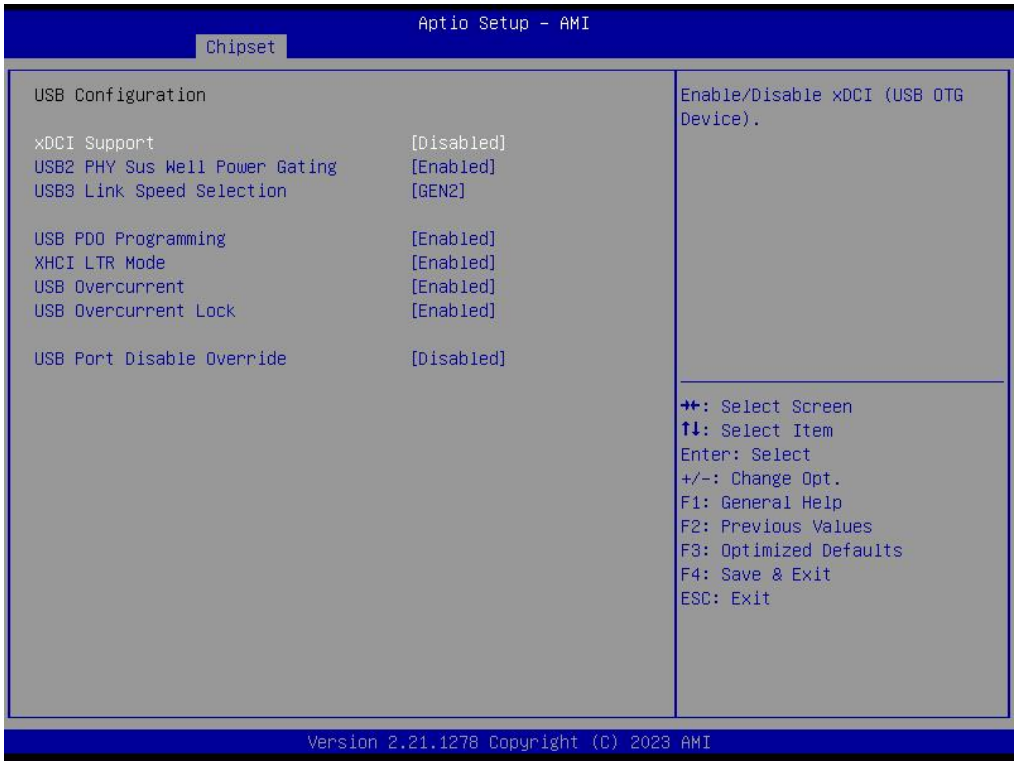


▶SATA And RST Configuration

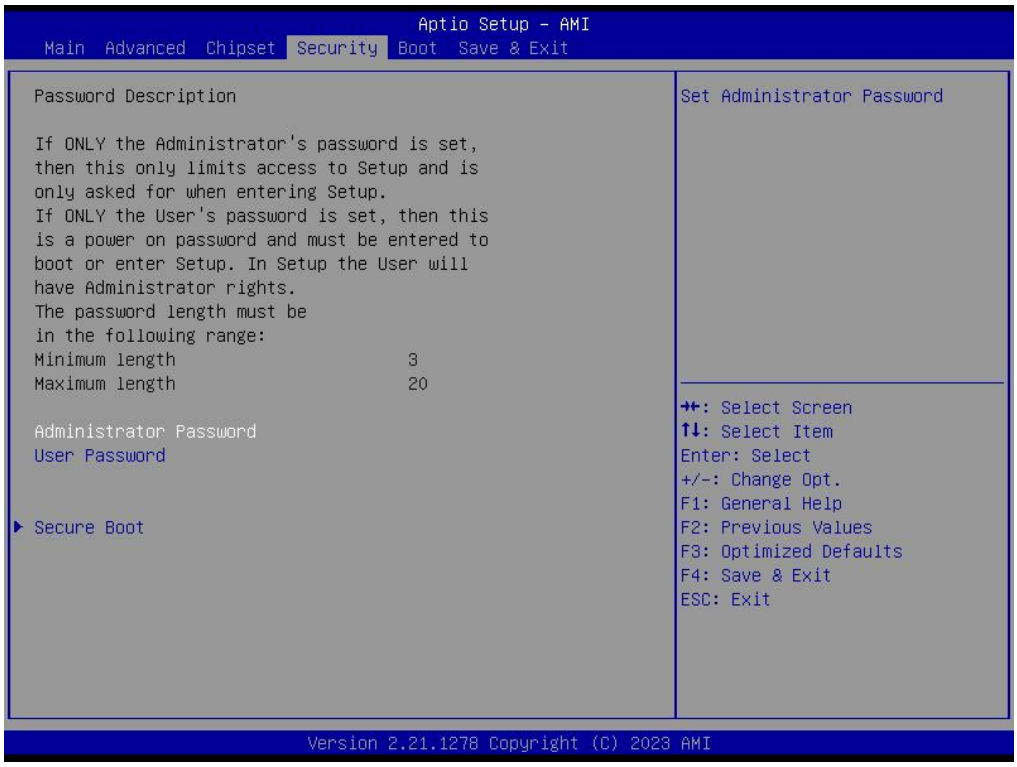
SATA hard disk and fast storage configuration, enter this sub-menu, there will be related settings of the hard disk.



▶USB Configuration



3.2.5 Security menu



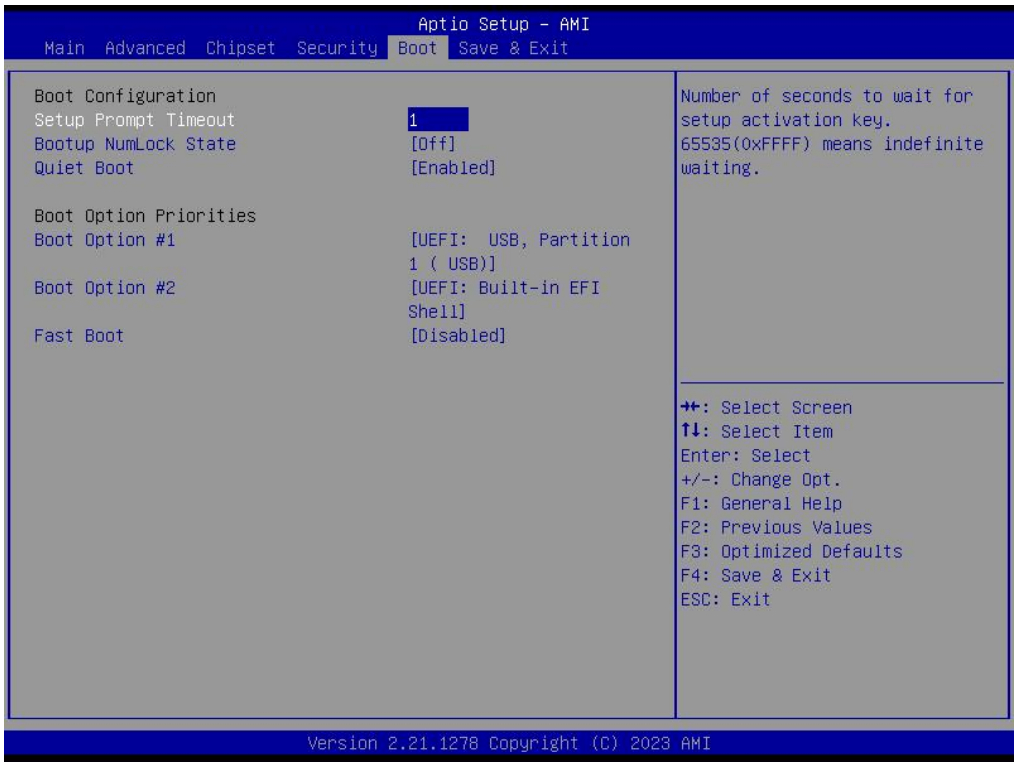
Administrator Password

This item sets the information of the administrator password.

User Password

This item sets the information of the normal user password.

3.2.6 Boot menu



Setup Prompt Timeout

Setup prompts for waiting time. This option is to set the time to wait for the Del key to enter the BIOS setup after booting.

Bootup NumLock State

Set the state of the small numeric keypad at startup.

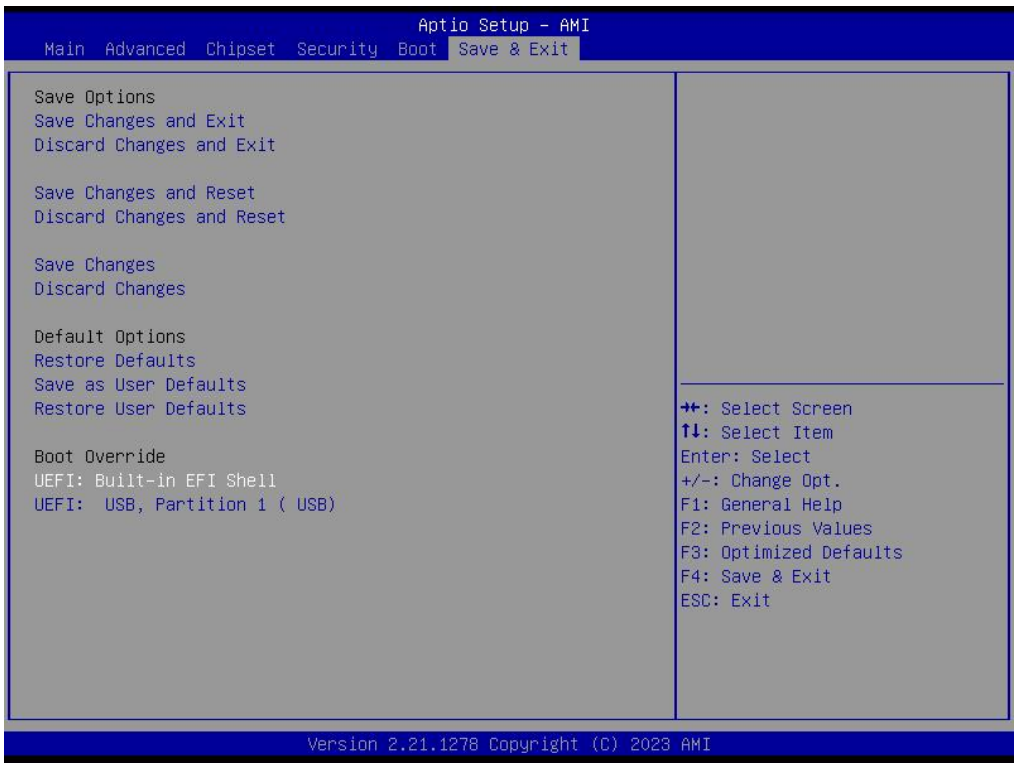
Quiet Boot

Switch full screen logo control

Fast Boot

Turn the quick start function on or off. When set to "Enabled", the system will skip some detection items and reduce the startup time.

3.2.7 Save & Exit menu



Save changes and Exit;

This item enables you to save the changes that you have made and exit.

Discard Changes and Exit;

This item enables you to discard the changes that you have made and exit.

Save Changes and Reset;

This item enables you to save the changes that you have made and reset.

Discard Changes and Reset;

This item enables you to discard the changes that you have made and reset.

Save Changes;

This item enables you to save the changes that you have made.

Discard Changes;

This item enables you to discard the changes that you have made.

Restore Defaults;

This item enables you to restore the system defaults.

Save as User Defaults;

This item enables you to save the changes as user defaults that you have made.

Restore User Defaults;

This item enables you to restore the user defaults.

3.3 Updating the BIOS

The BIOS (Basic Input and Output System) Setup Utility displays the system's configuration status and provides you with options to set system parameters. The parameters are stored in battery-backed-up CMOS RAM that saves this information when the power is turned off. When the system is turned back on, the system is configured with the values you stored in CMOS.

The BIOS provides the underlying driver for hardware resources and is the bridge between hardware and operating system. Now hardware and various applications are constantly updated. When your system encounters problems, such as the system does not support the latest published CPU, you need to upgrade your BIOS.

NOTE:

1. Only upgrade the BIOS if you encounter problems and need to.
2. To upgrade the BIOS, please use the BIOS read/write program attached to our driver CD or download the updated version of the program from the relevant website.
3. Do not turn off the power or reboot the system during the upgrade process, so your BIOS data will be damaged and the system may not boot.
4. After the refresh is complete, you need to manually optimize the LOAD Default.
5. To prevent accidents, please backup the current BIOS data first.

CHAPTER 4

SYSTEM RESOURCE

4.1 WDT and GPIO

```
#pragma once;
#include <windows.h>
#ifdef DLL_IMPLEMENT
#define DLL_API __declspec(dllexport)
#else
#define DLL_API __declspec(dllimport)
#endif

/*
================================================================================
===
 1   * void jhctech_init();
 2   * Function description: initialization of the library, before calling other functions, need to call this
function
 3 * Parameter description:
4 * Creation date:
 5                                                                              *
================================================================================
===*/


/*
================================================================================
===
 1   * void jhctech_init();
 2   * Function description: The release of the library, with jhctech_init pairing appears, when not needed
to release the library occupied resources
 3   *    Parameter description：
 4   * Creation date：
 5                                                                              *
================================================================================
===*/
```

```
/*
================================================================================
===
 1   * void watchdog_set(int time);
 2   * Function Description: Watchdog function
 3   * Parameter Description: time Sets the feeding time for the dog. The value of time is 0 to 255，
                                If 0 is set, the watchdog is disabled
 4   * Creation date：
 5                                                                              *
================================================================================
===*/


/*
================================================================================
===
 1   * void smbus_16pin_gpio_mode(int port,int mode);
 2   * Function Description: Sets the input/output mode of a sub-card
 3   * Parameter description:

     Parameter: port Enter the GPIO number (1 or 2)
                mode A byte of 8 bit, each bit controls a GPIO pin I/O mode,
                When the corresponding bit is 1, the corresponding pin serves as the input port
                When the corresponding bit is 0, the corresponding pin serves as the output outlet

  mode      --bit7----bit6----bit5----bit4----bit3----bit2----bit1----bit0--
                    |       |       |       |       |       |       |       |
GPIO pin   --PIN8----PIN7----PIN6----PIN5----PIN4----PIN3----PIN2----PIN1--

                In the pin as the output mode, the output value is valid
 4   *   Creation date：
 5                                                                              *
================================================================================
===*/
```

```
/*
================================================================================
===
 1  * void smbus_16pin_gpio_output(int port,int level);
 2  * Function description: Child card output high and low level
 3  * Parameter description:：
     Parameter: port Enter the GPIO number (1 or 2)
         One byte of level 8 bit, each bit controlling a GPIO pin output value,
         When the corresponding bit is 1, the corresponding pin output high level
         When the corresponding bit is 0, the corresponding pin output is low

       level        --bit7----bit6----bit5----bit4----bit3----bit2----bit1----bit0--
                      |        |         |         |         |         |         |
       GPIO pin    --PIN8----PIN7----PIN6----PIN5----PIN4----PIN3----PIN2----PIN1--

                  In the pin as the output mode, the output value is valid
 4  *    Creation date：
 5                                                                              *
================================================================================
===*/

/*
================================================================================
===
 1  * int smbus_16pin_gpio_input(int port);
 2  * Function description: Read board GPIO input level
 3  * Parameter description：
    Return value: Returns a byte (8 bits), each of which corresponds to the level state of a GPIO pin

   Return value  --bit7----bit6----bit5----bit4----bit3----bit2----bit1----bit0--
                   |        |         |         |         |         |         |
   GPIO pin     --PIN8----PIN7----PIN6----PIN5----PIN4----PIN3----PIN2----PIN1--
```

```
    Parameter: port Enter the GPIO number (1 or 2)
    Note: When the pin is used as the input mode, the read value is valid
4   * Creation date：
5                                                                              *
================================================================================
===*/


extern "C" DLL_API void jhctech_init();

extern "C" DLL_API void jhctech_deinit();
extern "C" DLL_API    int Read_msr(DWORD index);
extern "C" DLL_API void IO_write(WORD port,BYTE value);

extern "C" DLL_API int change_conf(int board);
extern "C" DLL_API int change_port(int port, int board);
extern "C" DLL_API int change_output(int port, int board);
extern "C" DLL_API int change_input(int port, int board);

extern "C" DLL_API void led_init();
extern "C" DLL_API void watchdog_set(int time);
extern "C" DLL_API void smbus_gpio_mode(int port,int mode, int board);
extern "C" DLL_API void smbus_gpio_output(int port,int level, int board);
extern "C" DLL_API int smbus_gpio_input(int port, int board);
```

Note: If you want more programs of the motherboard's watchdog and subcard's GPIO, please call +86-0755-86021176-(8021)/+86-0755-86021176-(8023) for more information.