LI1B Series

User's Manual

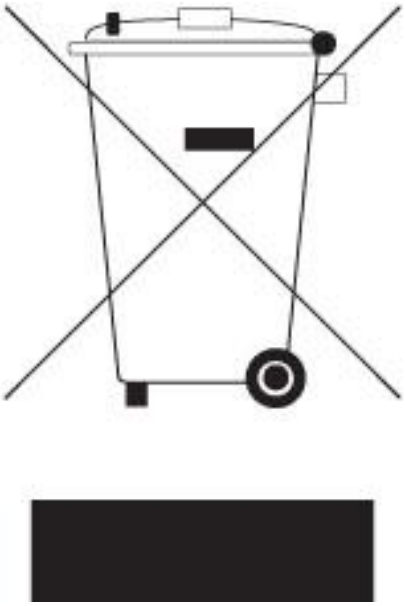
NO. G03-LI1B-F

Revision: 1.0

Release date: December 10, 2021

Environmental Protection Announcement

Do not dispose this electronic device into the trash while discarding. To minimize pollution and ensure environment protection of mother earth, please recycle.



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Environmental Safety Instruction

- Avoid the dusty, humidity and temperature extremes. Do not place the product in any area where it may become wet.
- 0 to 40 centigrade is the suitable temperature. (The temperature comes from the request of the chassis and thermal solution)
- Generally speaking, dramatic changes in temperature may lead to contact malfunction and crackles due to constant thermal expansion and contraction from the welding spots' that connect components and PCB. Computer should go through an adaptive phase before it boots when it is moved from a cold environment to a warmer one to avoid condensation phenomenon. These water drops attached on PCB or the surface of the components can bring about phenomena as minor as computer instability resulted from corrosion and oxidation from components and PCB or as major as short circuit that can burn the components. Suggest starting the computer until the temperature goes up.
- The increasing temperature of the capacitor may decrease the life of computer. Using the close case may decrease the life of other device because the higher temperature in the inner of the case.
- Attention to the heat sink when you over-clocking. The higher temperature may decrease the life of the device and burned the capacitor.

USER'S NOTICE

Manual Revision Information

Reversion	Revision History	Date
1.0	First Edition	December 10, 2021

Item Checklist

- ☑ Motherboard
- ☑ Cable(s)
- ☑ I/O Back panel shield

Chapter 1
Introduction of the Motherboard

1-1 Feature of Motherboard

- Onboard Intel® ElkhartLake series processor
- Support 1* DDR4 3200MHz SO-DIMM up to 16GB and single channel function
- Integrated with 2* Intel i211AT Gigabit Ethernet LAN chip
- Support 2* USB 3.1(Gen.1) & 7* USB2.0 data transport demand
- Support 1* SATAIII (6Gb/s) Devices & 1* M.2 (M-key)
- Support 1* VGA port & 1* EDP & 1* LVDS Output
- Support 2* COM port (RS232/422/485) & 4* COM port (RS232)
- Onboard 1* M.2 E-key support WIFI/BT Module
- Onboard 1* M.2 B-key support 4G/5G Module
- Support Smart FAN function
- Support ACPI S3 Function
- Support Watchdog Timer Technology

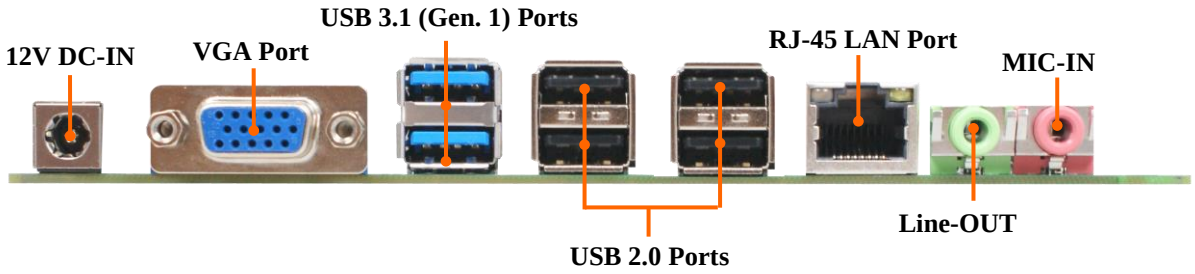
1-2 Specification

Spec	Description
Design	● Mini-ITX form factor 6 layers; PCB size: 17.0x17.0cm
Embedded CPU	● Integrated Intel® ElkhartLake series CPU ** for detailed CPU support information please visit our website*
Memory Slot	● 1*DDR4 SO-DIMM slot support 1* DDR4 3200MHz up to 16GB
Expansion Slot	● 1* M.2 E-key 2230 slot supports WIFI/BT Module (**M2E1**) ● 1* M.2 B-key 3042/3052 slot supports 4G/5G Module **(M2B1)** ● 1* SIM card slot function with M.2 B-key, 3042/3052 slot **(SIMCARD1)**
Storage	● 1* SATA III 6G/s connector ● 1 * M.2 M-key 2242/2280 slot supports SATA or NVMe/ PCIex2 interface **(M2M1)**
LAN Chip	● Integrated with 2* Intel i211AT Gigabit Ethernet LAN chip ● Support Fast Ethernet LAN function of providing 10/100/1000 Mbps Ethernet data transfer rate
BIOS	● AMI 128M Flash ROM
Rear I/O	● 1* 12V DC-in power jack ● 1* CRT port (co-lay HDMI1) ● 2* USB 3.1 (Gen.1) ports ● ***Model LI1B-00:*** 4* USB2.0 & 1* RJ-45 Lan Port ● ***Model LI1B-0L:*** 2* USB2.0 & 2* RJ-45 Lan ports ● 1* Audio Line-out & 1* MIC-in
Internal I/O	● 1* 4-pin internal 12V DC-in power connector ● 1* SATA power-out connector ● 1* Front panel hearer ● 1* Front audio header ● 1* 3W Speaker header

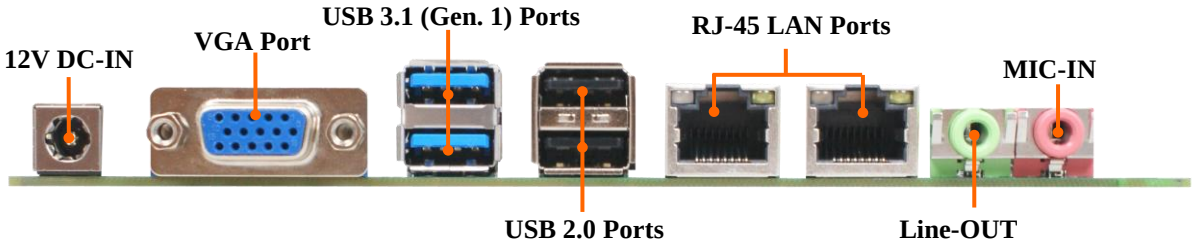
	● ***Model LI1B-00***: 2* 9-Pin USB 2.0 header ● ***Model LI1B-0L***: 1* 9-Pin USB 2.0 headers ● 1* 4-Pin USB 2.0/1.1 wafer for 1* USB 2.0/1.1 ports ● 1* SMBUS header ● 1* GPIO header ● 6* Serial port header *(COM3/4/5/6 support RS232, COM1/2 support RS232/422/485)* ● 1* EDP2 connector (co-lay HDMI2) ● 1* LVDS connector (co-lay EDP1) ● 1* Inverter connector

1-3 Layout Diagram

Rear IO Diagram
For LI1B-00 Series:

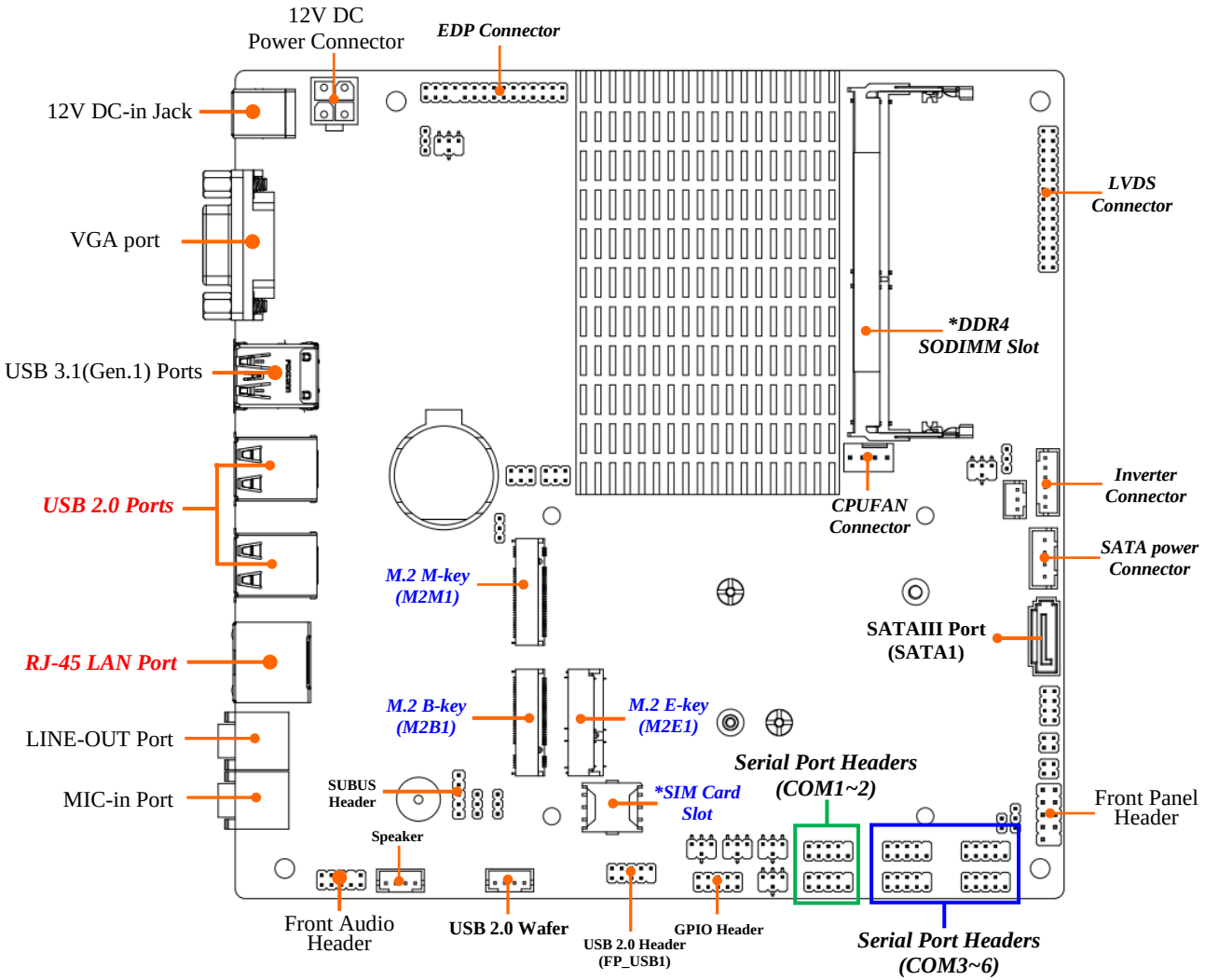


For LI1B-0L Series:

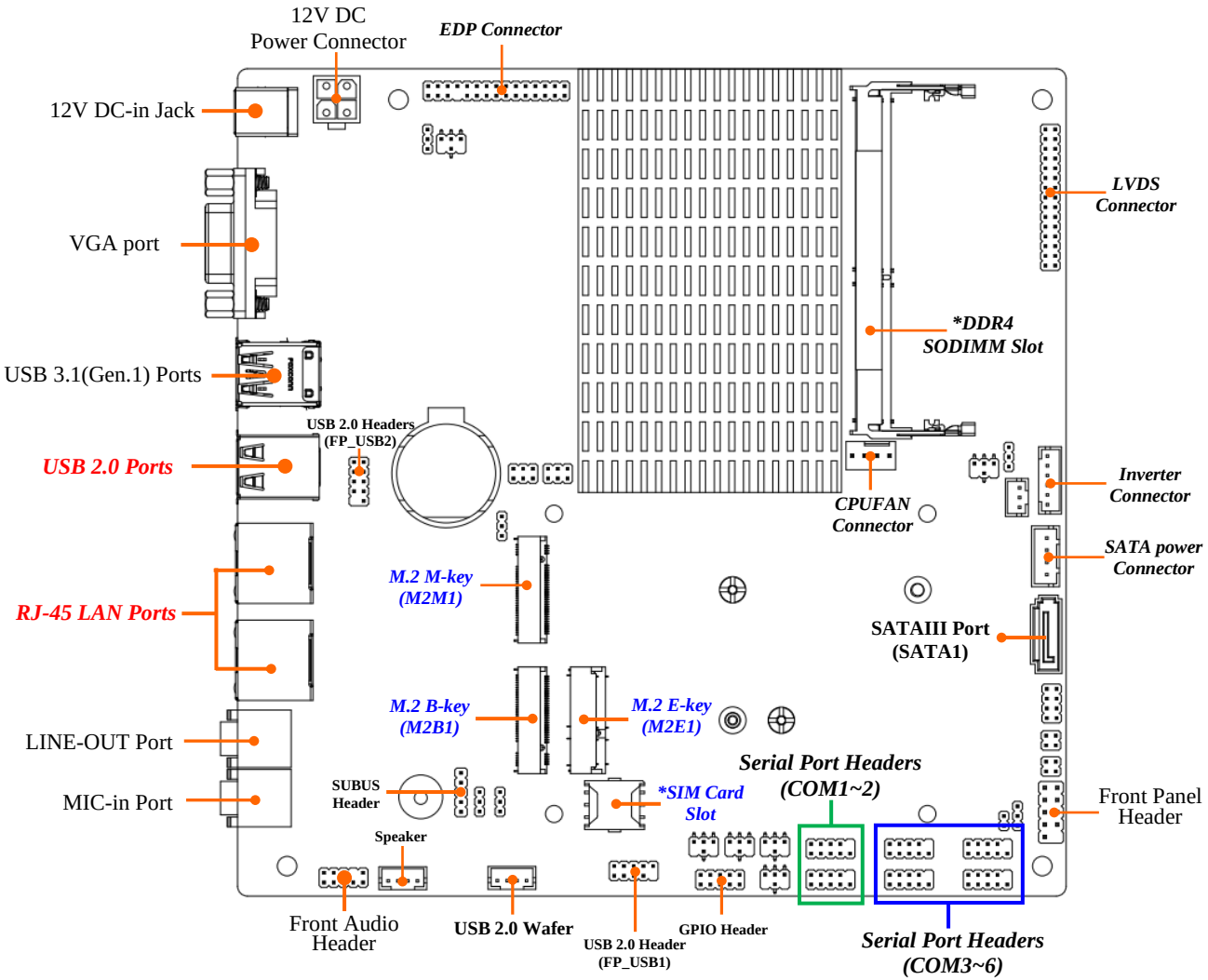


Motherboard Internal Diagram-Front

For LI1B-00 Series:

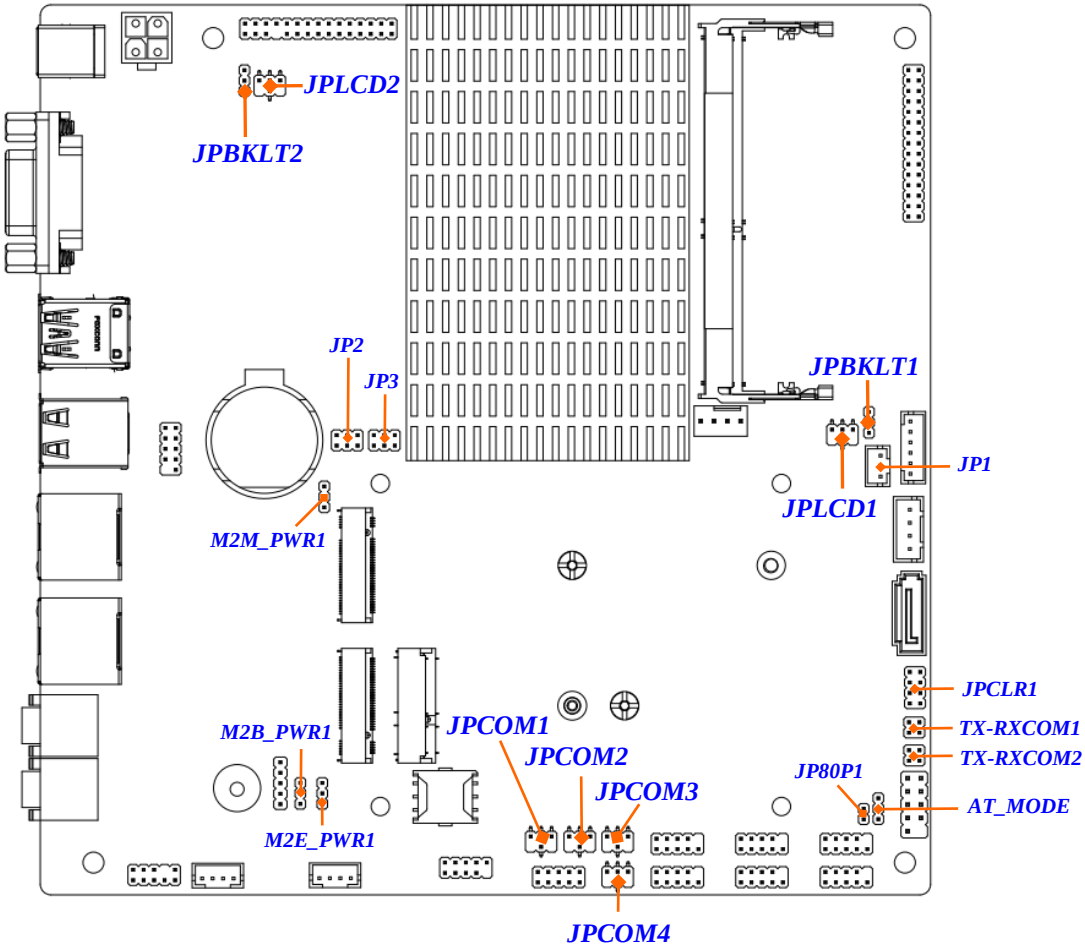


For LI1B-0L Series:



***Note: SIM card slot** only work **when** compatible SIM card installed & 4G/5G LAN card installed in **M2B1** USB slot.*

Motherboard Jumper Position



Jumper

Jumper	Name	Description
JPCOM1	COM1 Port Pin9 Function Select	4-pin Block (2.0 pitch)
JPCOM2	COM2 Port Pin9 Function Select	4-pin Block (2.0 pitch)
JPCOM3	COM3 Port Pin9 Function Select	4-pin Block (2.0 pitch)
JPCOM4	COM4 Port Pin9 Function Select	4-pin Block (2.0 pitch)
JP2	M2M1 Connector Function Select	6-pin Block (2.0 pitch)
JP3	M2M1 Connector Function Select	6-pin Block (2.0 pitch)
JPLCD1	LVDS/EDP1 LCD Panel VCC Select	4-pin Block (2.0 pitch)
JPLCD2	EDP2 LCD Panel VCC Select	4-pin Block (2.0 pitch)
JPBKLT1	LVDS/EDP1 LCD BACKLIGHT VCC Select	3-pin Block (2.0 pitch)
JPBKLT2	EDP2 LCD BACKLIGHT VCC Select	3-pin Block (2.0 pitch)
JPCLR1	PIN (1-2) = Clear ME_RTC PIN (3-4) = Clear CMOST PIN (5-6) = TXE Override PIN (7-8) = CASE OPEN	8-pin Block (2.0 pitch)
M2M_PWR1	M.2 M-key Power Select	3-pin Block (2.0 pitch)
M2B_PWR1	M.2 B-key Power Select	3-pin Block (2.0 pitch)
M2E_PWR1	M.2 E-key Power Select	3-pin Block (2.0 pitch)
JP80P1	GPIO/80 Port Function Select	2-pin Block (2.0 pitch)
AT_MODE	AT/ATX Mode Select	3-pin Block (2.0 pitch)

Connectors

Connector	Name
DCIN1	12V DC–in Power Jack
ATX12V1	4-Pin 12V Power Connector
VGA	VGA Port Connector
USB1	USB 3.1 (Gen.1) Port Connector X2
USB2	USB 2.0 Port Connector X2
USB3	USB 2.0 Wafer

USB4	USB 2.0 Port Connector X2 ***Option for LI1B-00 Series*** RJ-45 LAN Connector X1 ***Option for LI1B-0L Series***
LAN1	RJ-45 LAN Connector
LINE-OUT	Line-out Connector
MIC	MIC Connector
SPEAK_CON1	3W Amplifier Connector
SIMCARD	SIM card slot
SATA1	SATAIII Connector
SATAPWR1	SATA Power out Connector
CPUFAN1	FAN Connector
JP1	Light Control Connector

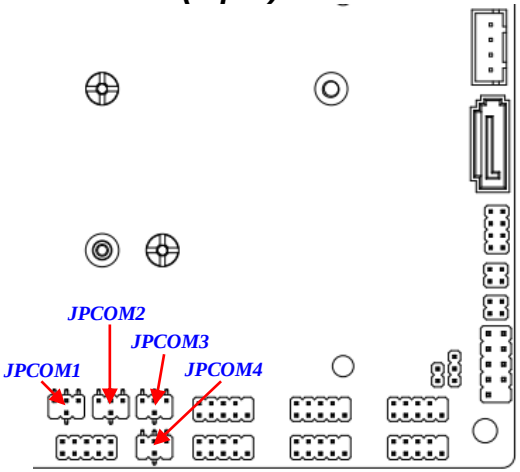
Headers

Header	Name	Description
JW_FP1	Front Panel Header (PWR LED/ HD LED/Power Button /Reset)	9-pin Block (2.54 pitch)
FP_AUDIO1	Audio Header X1	9-pin Block (2.0 pitch)
FP_USB1	USB Header X1	9-pin Block (2.0 pitch)
FP_USB2	USB Header X1 ***Option for LI1B-00 Series***	4-pin Block (2.0 pitch)
SMBUS1	SMBUS Header	5-pin Block (2.0 pitch)
GPIO1	GPIO Header	10-pin Block (2.0 pitch)
COM1/2/3/4/5/6	Serial Port Header	9-pin Block (2.0 pitch)
TX-RXCOM1	COM port1 RS422/RS485	4-pin Block (2.0 pitch)
TX-RXCOM2	COM port2 RS422/RS485	4-pin Block (2.0 pitch)
LVDS1	LVDS Inverter	30-pin Block (2.0 pitch)
EDP2	EDP Header	30-pin Block (2.0 pitch)
INVERTER1	Inverter Header	6-pin Block (2.0 pitch)

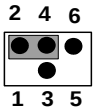
Chapter 2
Hardware Installation

2-1 Jumper Setting

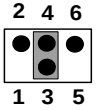
JPCOM1/2/3/4 (4-pin): COM1/2/3/4 Port Pin9 Function Select (2.0 pitch)



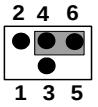
JPCOM1 → COM1 Port Pin-9
JPCOM2 → COM2 Port Pin-9
JPCOM3 → COM3 Port Pin-9
JPCOM4 → COM4 Port Pin-9



2-4 Closed: PIN9=RS232;

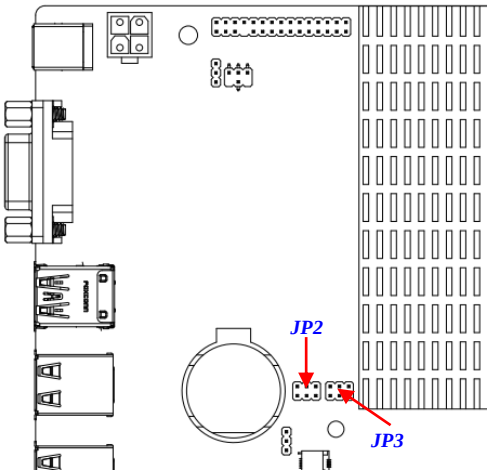


3-4 Closed: PIN9=+5V;

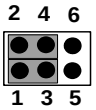


4-6 Closed: PIN9=+12V

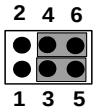
JP2/JP3 (6-pin): M2M1 Connector Function Select (2.0 pitch)



JP2/JP3 → M2M1 Connector Select

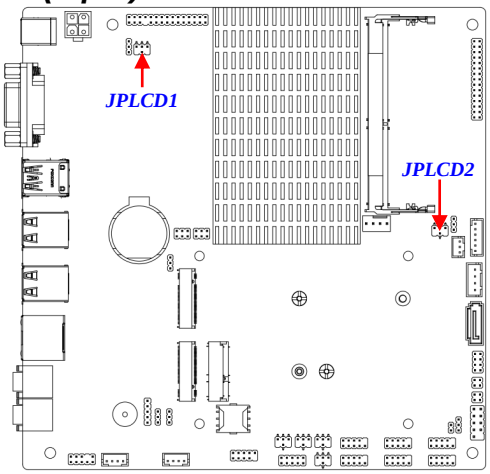


1-3 & 2-4 Closed: MSATA select

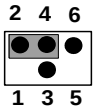


3-5 & 4-6 Closed: NVME select

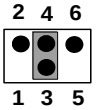
JPLCD (6-pin): LCD Panel VCC Select (2.0 pitch)



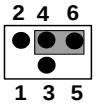
JPLCD1 → **LCD Panel VCC Select**
JPLCD2 → **LCD Panel VCC Select**



2-4 Closed:
VCC=+12V;

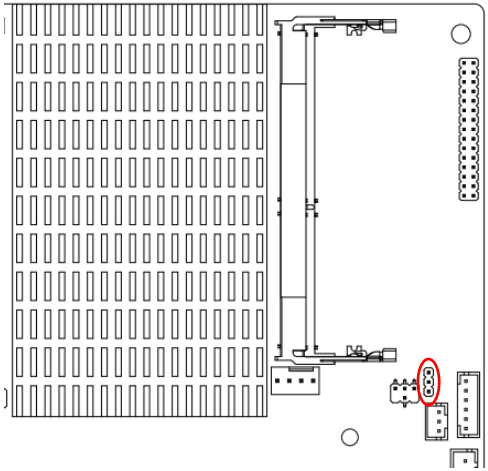


3-4 Closed:
VCC=+5V;

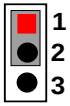


4-6 Closed:
VCC=+3.3V

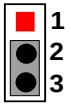
JPBKLT1 (3-pin): LCD BACKLIGHT VCC Select (2.0 pitch)



JPBKLT1 →LCD BACKLIGHT VCC Select

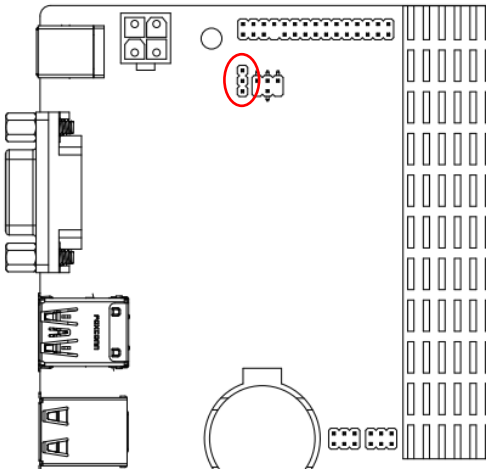


1-2 Closed:
VCC= +5V

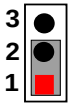


2-3 Closed:
VCC= +12V

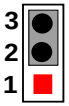
JPBKLT2 (3-pin): LCD BACKLIGHT VCC Select (2.0 pitch)



JPBKLT2→LCD BACKLIGHT VCC Select

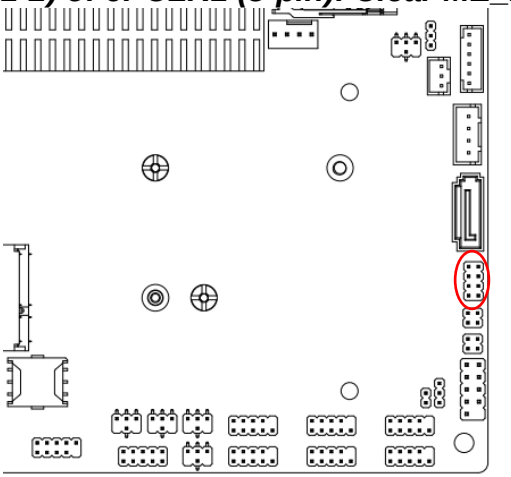


1-2 Closed:
VCC= +5V

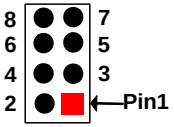


2-3 Closed:
VCC= +12V

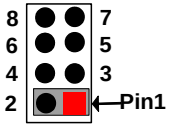
Pin (1-2) of JPCLR1 (8-pin): Clear ME_RTC (2.0 pitch)



PIN(1-2) Clear ME_RTC

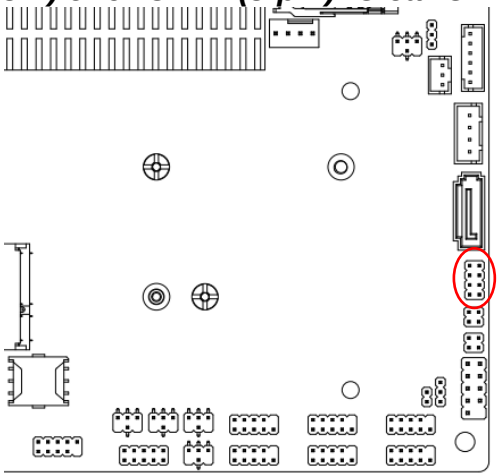


1-2 Open: Normal(Default)

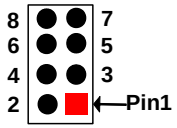


1-2 Closed: Clear ME_RTC

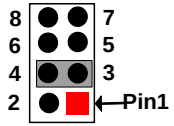
Pin (3-4) of JPCLR1 (8-pin): Clear CMOST (2.0 pitch)



PIN(3-4) Clear CMOST

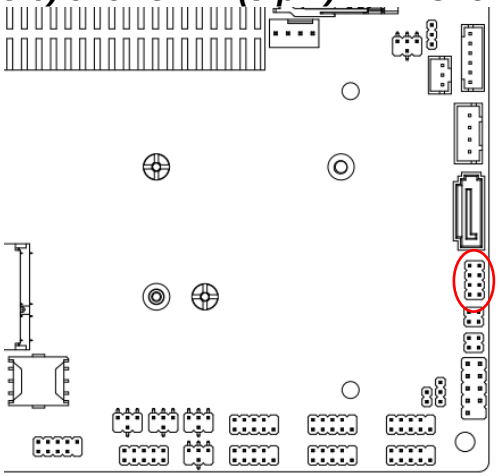


3-4 Open: Normal(Default)

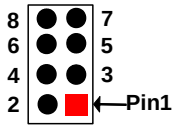


3-4 Closed: Clear CMOST

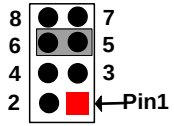
Pin (5-6) of JPCLR1 (8-pin): TXE Override (2.0 pitch)



PIN(5-6) TXE Override

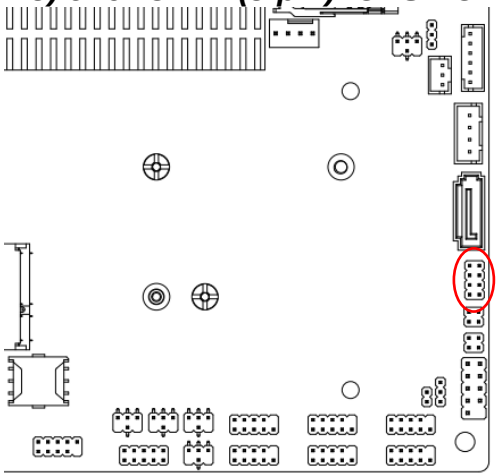


5-6 Open: Normal(Default)

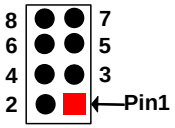


5-6 Closed: TXE Override

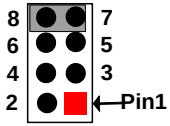
Pin (7-8) of JPCLR1 (8-pin): CASE OPEN (2.0 pitch)



PIN(7-8) CASE OPEN

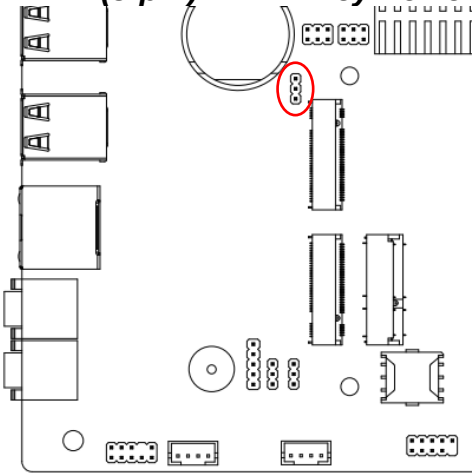


7-8 Open: Normal(Default)

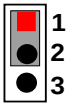


7-8 Closed: CASE OPEN

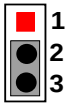
M2M_PWR1 (3-pin): M.2 M-key Power Select (2.0 pitch)



M2M_PWR1→M.2 M-key Power Select

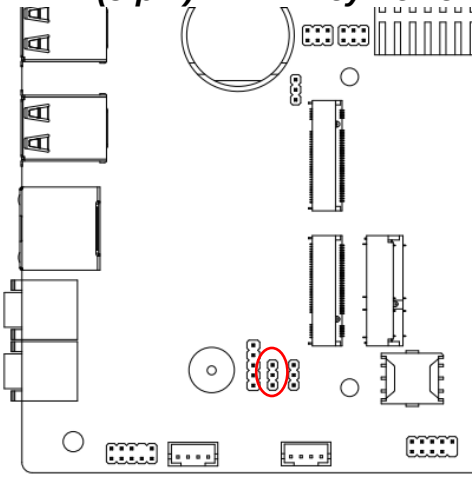


1-2 Closed:
VCC= VCC3

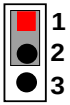


2-3 Closed:
VCC= 3VSB

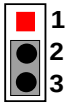
M2B_PWR1 (3-pin): M.2 B-key Power Select (2.0 pitch)



M2B_PWR1→M.2 B-key Power Select

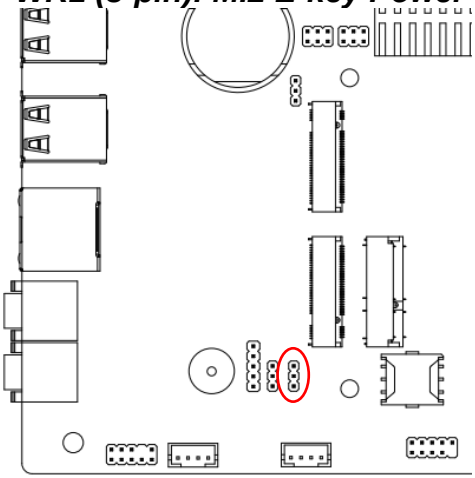


1-2 Closed:
VCC= VCC3

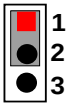


2-3 Closed:
VCC= 3VSB

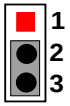
M2E_PWR1 (3-pin): M.2 E-key Power Select (2.0 pitch)



M2E_PWR1→M.2 E-key Power Select

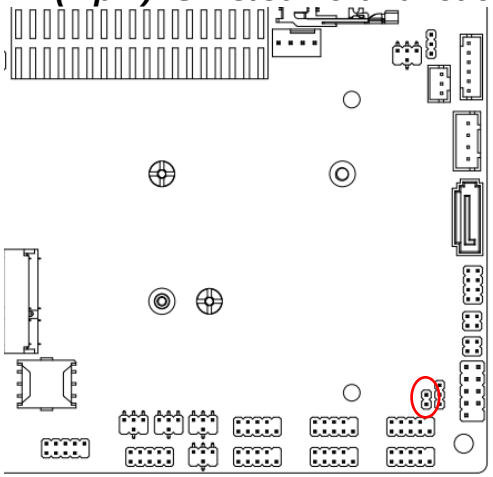


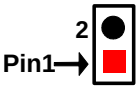
1-2 Closed:
VCC= VCC3



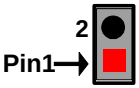
2-3 Closed:
VCC= 3VSB

JP80P1 (2-pin): GPIO/80 Port Function Select (2.0 pitch)



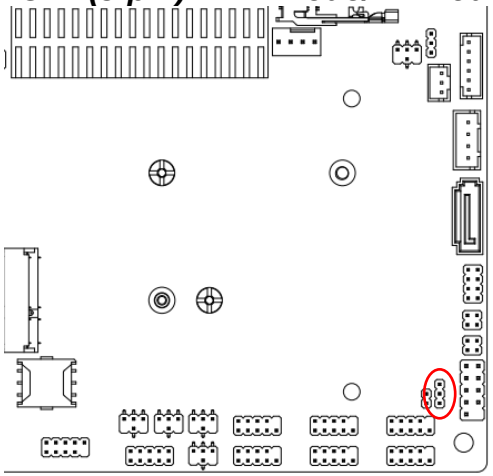


1-2 Open: GPIO1=80 Port

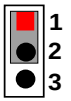


1-2 Closed: GPIO1=GPIO Port

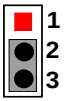
AT_MODE(3-pin): ATX Mode/AT Mode Select (2.0 pitch)



AT_MODE→ATX Mode/AT Mode Select



1-2 Closed: ATX MODE



2-3 Closed: AT MODE

***ATX Mode Selected**: Press power button to power on after power input ready;*
***AT Mode Selected:** Directly power on as power input ready.*

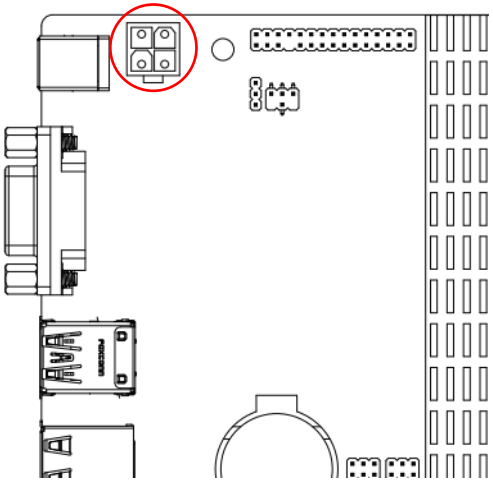
2-2-1 Connectors

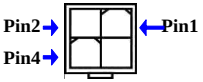
(1) Rear Panel Connectors

**** Refer to Page-3 Rear IO Diagram.***

Icon	*Name*	*Function*
	**12V DC-in Power Jack**	For user to connect compatible power adapter to provide power supply for the system.
	**VGA**	To connect display device that support VGA specification.
	**RJ-45 LAN Port**	This connector is standard RJ-45 LAN jack for Network connection.
	**USB 3.1 Ports**	To connect USB keyboard, mouse or other devices compatible with USB specification. USB 3.1 ports supports up to 5Gbps data transfer rate.
	**USB 2.0 Ports**	To connect USB keyboard, mouse or other devices compatible with USB specification.
	**Line-Out Connector**	For user to connect external speaker, earphones, etc to transfer system audio output.
	**Mic-in Connector**	For user to connect external microphone, etc to transfer external microphone into system.

(2) ATX12V1 (4-pin block): ATX12V Type Power Connector

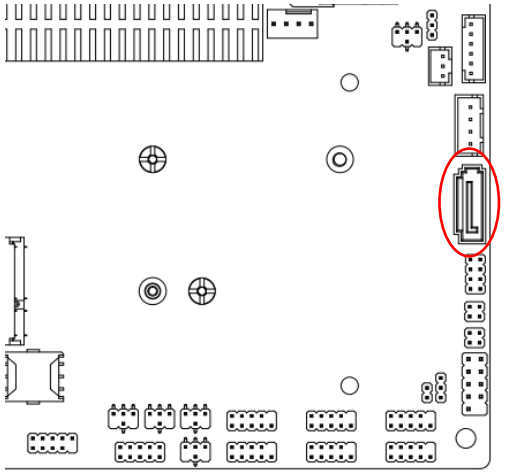




Pin No.	Definition
1	GND
2	GND
3	+12V
4	+12V

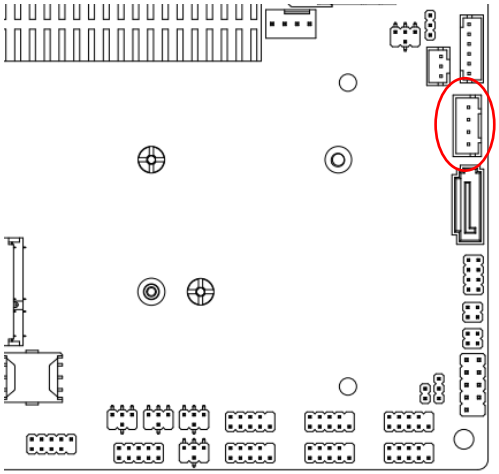
(3) SATA1 (7-pin): SATA III Port connector

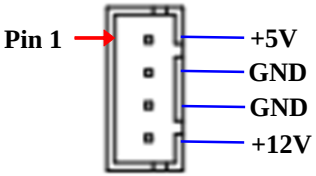
SATA1 are high-speed SATAIII port that supports 6 GB/s transfer rate.



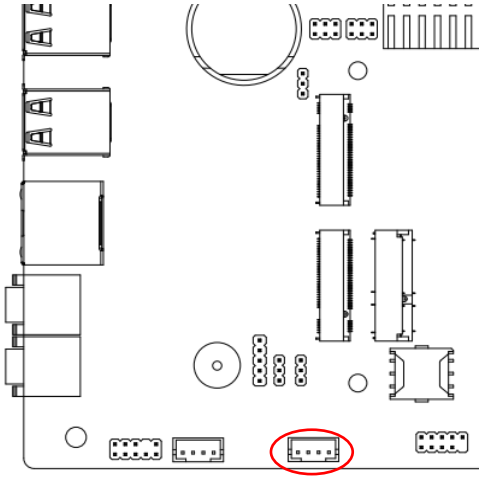
Pin No.	Defnition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

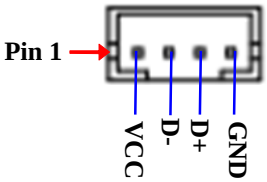
(4) SATAPWR (4-pin): SATA HDD Power-Out Connector



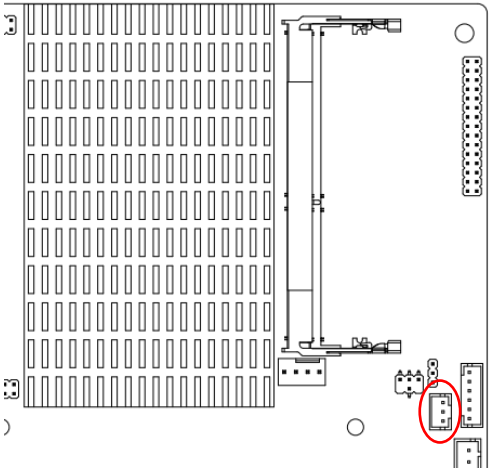


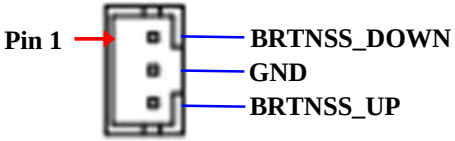
(5) USB3 (4-pin): USB 2.0 Connector



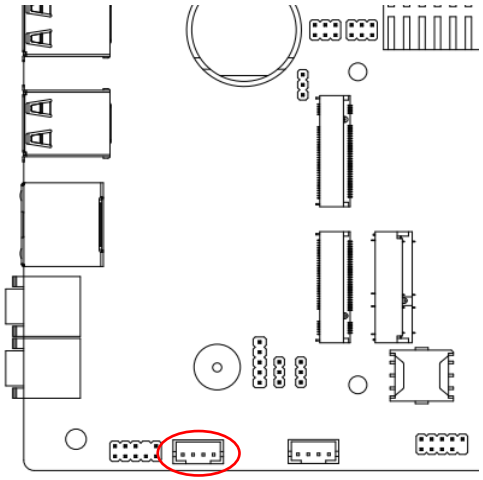


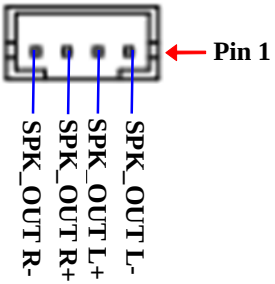
(6) JP1 (3-pin): Light Control Connector



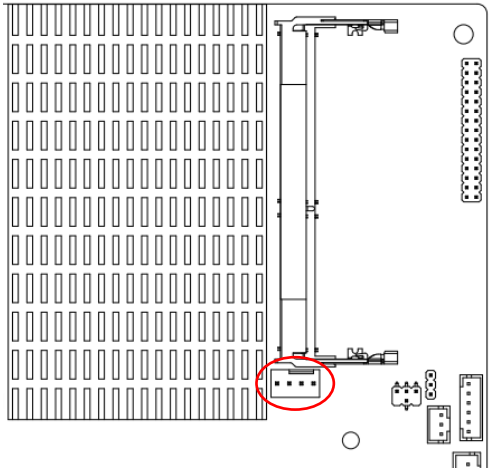


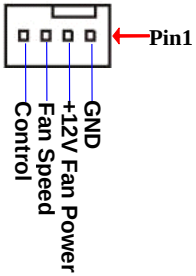
(7) SPEAK_CON1 (4-pin): 3W Amplifier Connector





(8) CPUFAN1 (4-pin): Fan Connector (2.54 pitch)

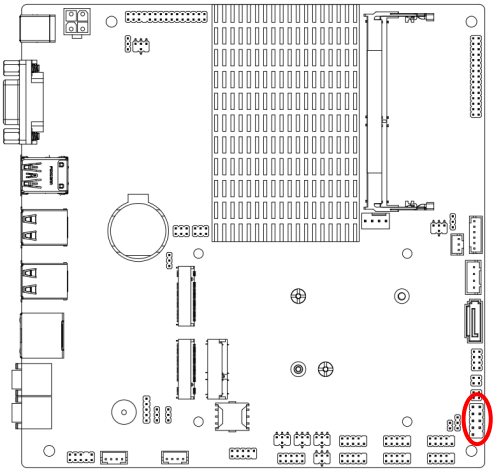


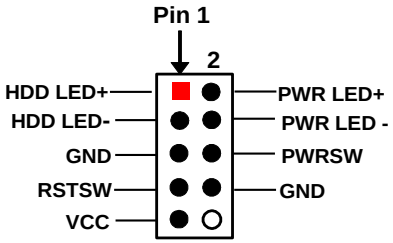


CPUFAN1

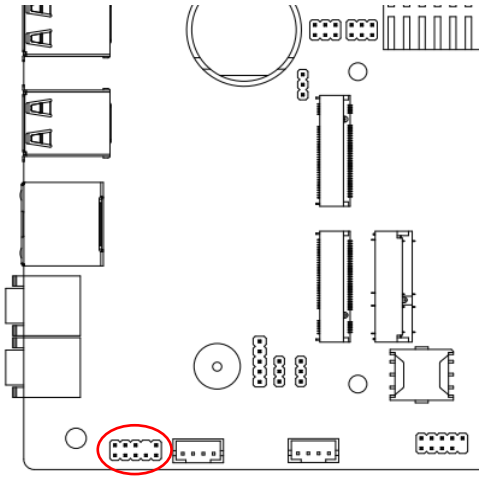
2-2-2 Headers

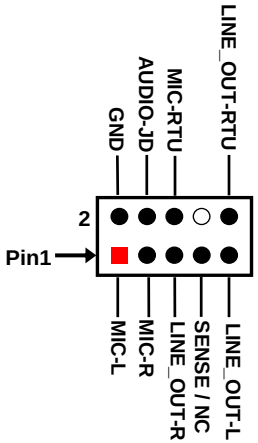
(1) JW_FP1 (9-pin): Front Panel Header (2.54 pitch)



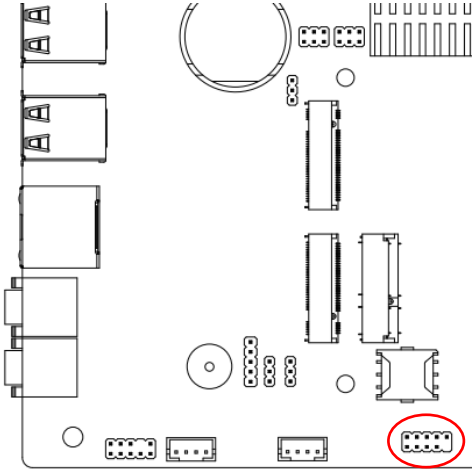


(2) FP_AUDIO1 (9-pin): Line-Out, MIC-In Header (2.0 pitch)

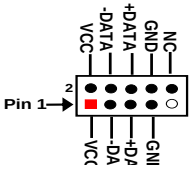




(3) FP_USB1 (9-pin): USB 2.0 Port Headers (2.0 pitch)

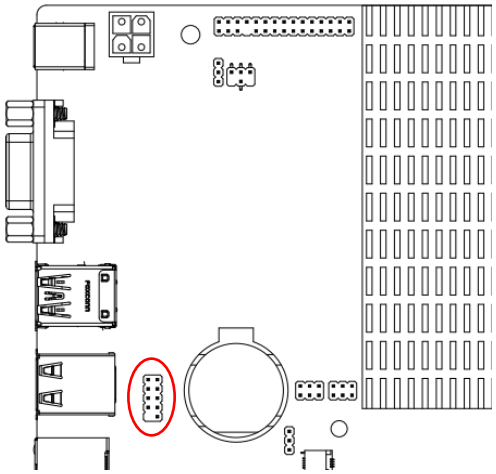


*FP_USB1 → USB 2.0 Port *2*

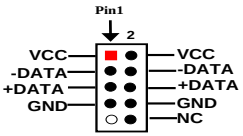


(4) FP_USB2 (9-pin): USB 2.0 Port Headers (2.0 pitch)

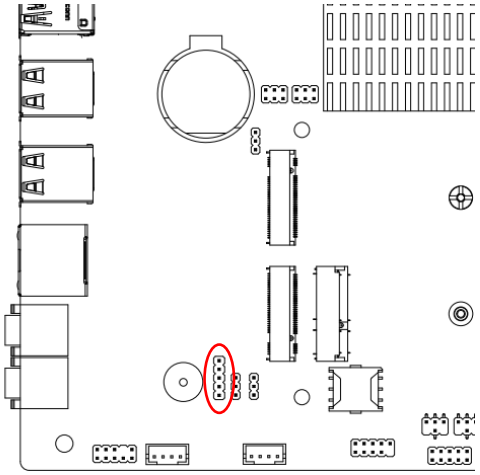
Option for LI1B-00 Series

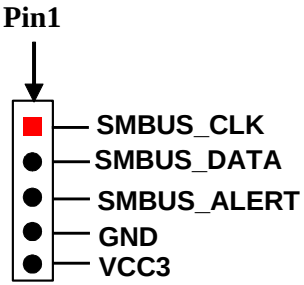


*FP_USB2 → USB 2.0 Port *2*

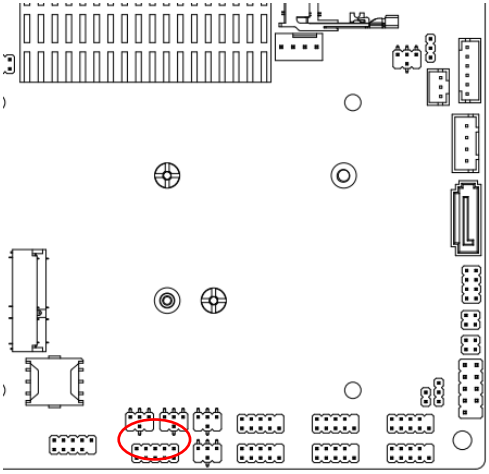


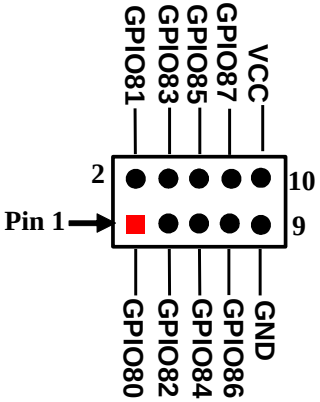
(5) SMBUS (5-Pin): SMBUS Header (2.0 pitch)



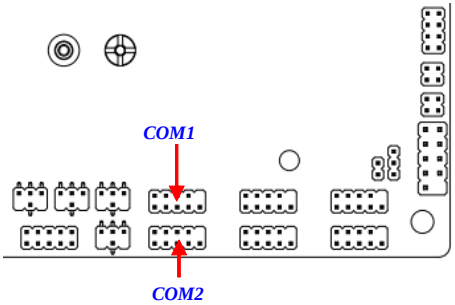


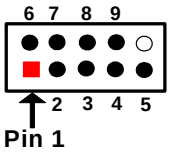
(6) GPIO1(10-pin): GPIO Header (2.0 pitch)





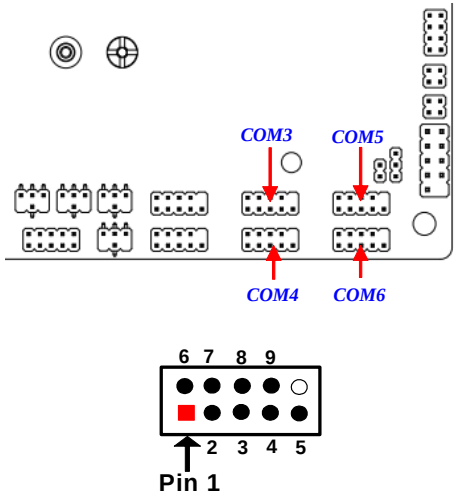
(7) COM1/COM2 (9-pin): RS232/422/485 Serial Port Header (2.0 pitch)





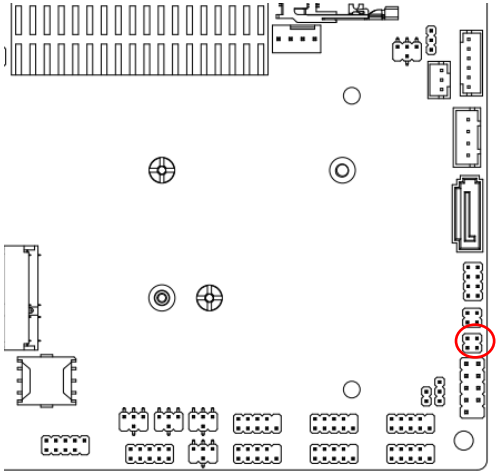
Pin NO.	RS232	*RS422 (optional)	*RS485 (optional)
Pin 1	DCD	TX-	DATA-
Pin 2	RXD	TX+	DATA+
Pin 3	TXD	RX+	NC
Pin 4	DTR	RX-	NC
Pin 5	GND	GND	GND
Pin 6	DSR	NC	NC
Pin 7	RTS	NC	NC
Pin 8	CTS	NC	NC
Pin 9	RI	NC	NC

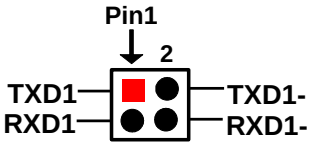
(8) COM3/COM4/COM5/COM6 (9-pin): RS232 Serial Port Header (2.0 pitch)



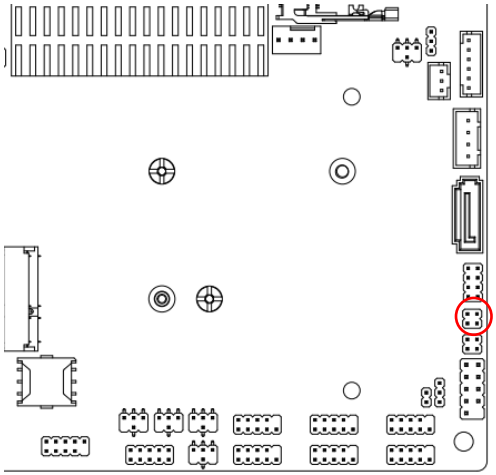
Pin NO.	RS232
Pin 1	DCD
Pin 2	SIN
Pin 3	SOUT
Pin 4	DTR
Pin 5	GND
Pin 6	DSR
Pin 7	RTS
Pin 8	CTS
Pin 9	RI

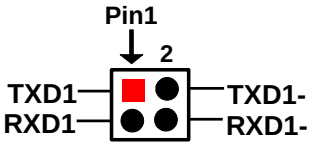
(9) TX-RXCOM1 (4-pin): COM Port1 RS422/RS485 (2.0 pitch)



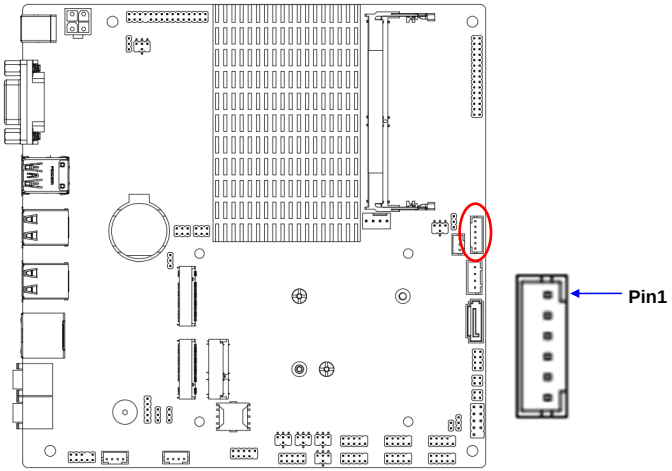


(10) TX-RXCOM2 (4-pin): COM Port2 RS422/RS485 (2.0 pitch)



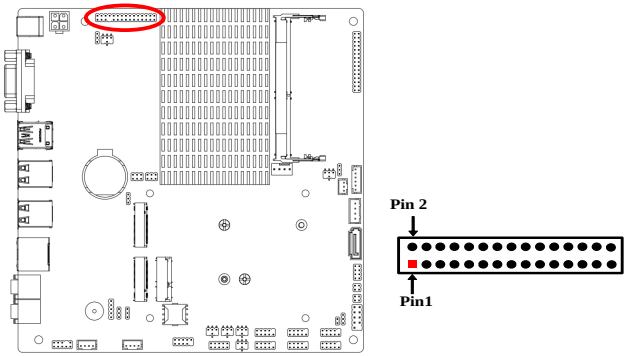


(11) INVERTER1 (6-pin): LVDS Inverter Connector (2.0 pitch)



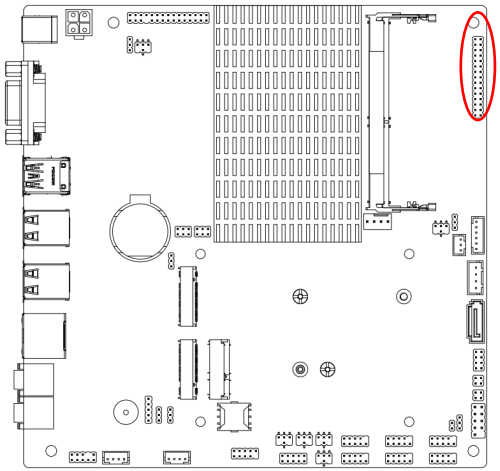
Pin No.	Definition
6	GND
5	GND
4	Backlight PWM
3	Backlight Enable
2	Backlight Power
1	Backlight Power

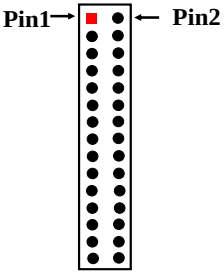
(12) EDP2(30-pin): EDP Connector (2.0 pitch)



Pin No.	Pin Define	Pin No.	Pin Define
Pin 2	BKLT2_PWR	**Pin 1**	BKLT2_PWR
Pin 4	GND	**Pin 3**	BKLT2_PWR
Pin 6	NC	**Pin 5**	GND
Pin 8	EDP2_SCL	**Pin 7**	GND
Pin 10	EDP2_SDA	**Pin 9**	GND
Pin 12	GND	**Pin 11**	EDP2_VCC
Pin 14	GND	**Pin 13**	GND
Pin 16	EDP2_AUXP	**Pin 15**	BKLTEN
Pin 18	EDP2_AUXN	**Pin 17**	EDP2_HPDGND
Pin 20	GND	**Pin 19**	GND
Pin 22	EDP2_DATA3N	**Pin 21**	EDP2_DATA3P
Pin 24	EDP2_DATA2N	**Pin 23**	EDP2_DATA2P
Pin 26	GND	**Pin 25**	GND
Pin 28	EDP2_DATA1N	**Pin 27**	EDP2_DATA1P
Pin 30	EDP2_DATA0N	**Pin 29**	EDP2_DATA0P

(13) LVDS1 (30-pin): 24-bit Dual Channel LVDS Header (2.0 pitch)





Pin Define	Pin NO.	Pin NO.	Pin Define
LVDSB_DATAP3	Pin 30	Pin 29	LVDSB_DATAN3
LVDS_CLKBP	Pin 28	Pin 27	LVDS_CLKBN
GND	Pin 26	Pin 25	GND
LVDSB_DATAP2	Pin 24	Pin 23	LVDSB_DATAN2
LVDSB_DATAP1	Pin 22	Pin 21	LVDSB_DATAN1
LVDSB_DATAP0	Pin 20	Pin 19	LVDSB_DATAN0
LVDSA_DATAP3	Pin 18	Pin 17	LVDSA_DATAN3
LVDS_CLKAP	Pin 16	Pin 15	LVDS_CLKAN
GND	Pin 14	Pin 13	GND
LVDSA_DATAP2	Pin 12	Pin 11	LVDSA_DATAN2
LVDSA_DATAP1	Pin 10	Pin 9	LVDSA_DATAN1
LVDSA_DATAP0	Pin 8	Pin 7	LVDSA_DATAN0
GND	Pin 6	Pin 5	GND
GND	Pin 4	Pin 3	LCD_VCC
LCD_VCC	Pin 2	Pin 1	LCD_VCC

Chapter 3
Introducing BIOS

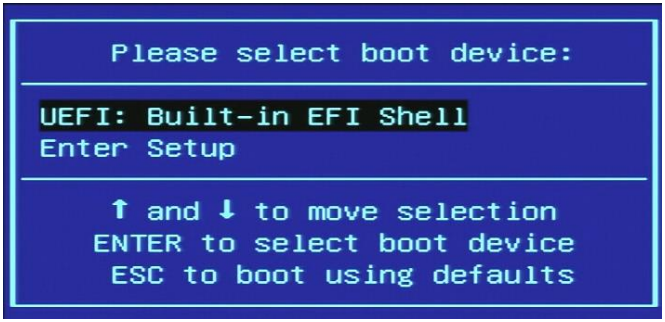
Notice!	The BIOS options in this manual are for reference only. Different configurations may lead to difference in BIOS screen and BIOS screens in manuals are usually the first BIOS version when the board is released and may be different from your purchased motherboard. Users are welcome to download the latest BIOS version form our official website.

The BIOS is a program located on a Flash Memory on the motherboard. This program is a bridge between motherboard and operating system. When you start the computer, the BIOS program will gain 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 device and configures the parameters of the hardware synchronization. Only when these tasks are completed done it gives up control of the computer to operating system (OS). Since the BIOS is the only channel for hardware and software to communicate, it is the key factor for system stability, and in ensuring that your system performance as its best.

3-1 Entering Setup

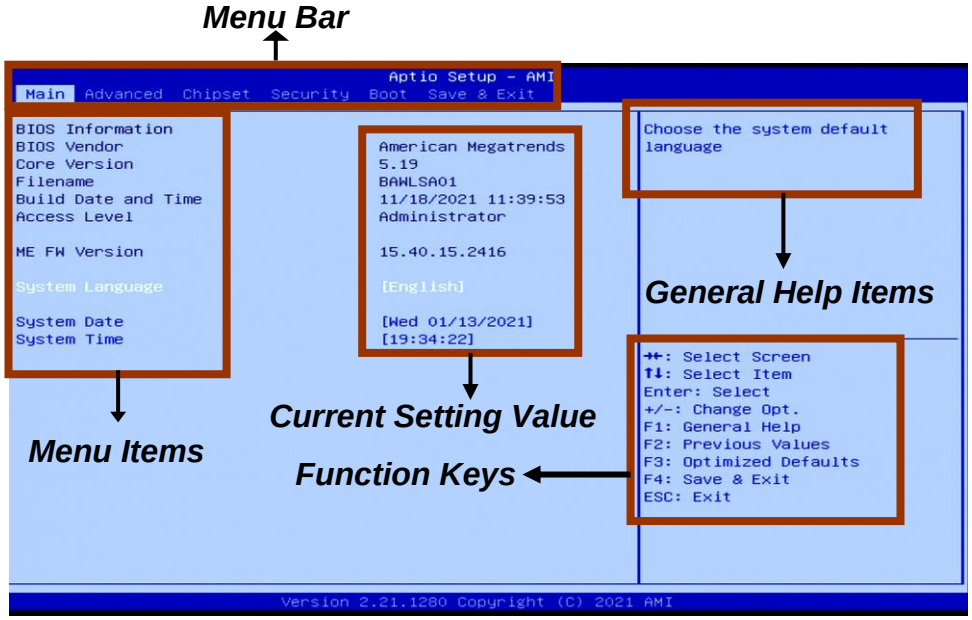
Power on the computer and by pressing <Del> immediately allows you to enter Setup. If the message disappears before your respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the “RESET” button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt> and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to

Press **<Del>** to enter Setup; press < **F7**> to enter pop-up Boot menu.



3-2 BIOS Menu Screen

The following diagram show a general BIOS menu screen:



3-3 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←→ (left, right) 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 <+>/<–> keys when you want to modify the BIOS parameters for the active option.
- [F1]: General help.
- [F2]: Previous values.
- [F3]: Optimized defaults.
- [F4]: Save & Exit.
- Press <Esc> to exit from BIOS Setup.

3-4 Getting Help

Main Menu

The on-line description of the highlighted setup function is displayed at the top right corner the screen.

Status Page Setup Menu/Option Page Setup Menu

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

3-5 Menu Bars

There are six menu bars on top of BIOS screen:

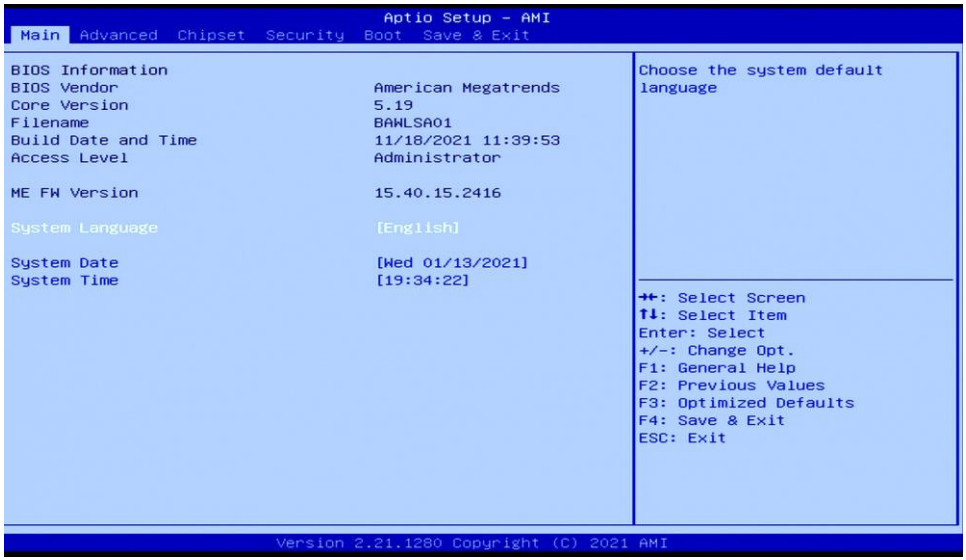
Main	To change system basic configuration
Advanced	To change system advanced configuration

Chipset	To change chipset configuration
Security	Password settings
Boot	To change boot settings
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.

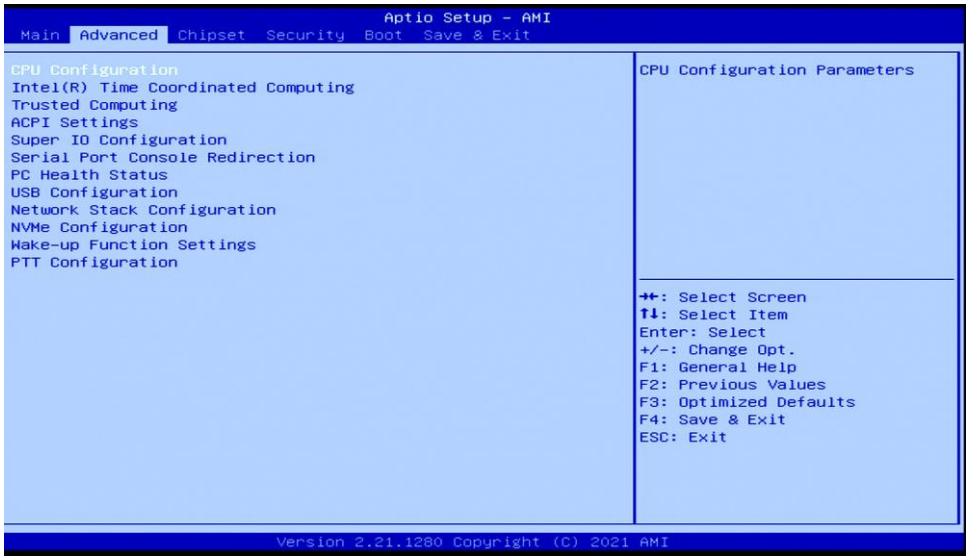
3-6 Main Menu

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 Language
Choose the system default language.
System Date
Set the date. Please use [Tab] to switch between data elements.
System Time
Set the time. Please use [Tab] to switch between time elements.

3-7 Advanced Menu



- **CPU Configuration**

  Press [Enter] to make settings for the following sub-items:

  Intel(R) SpeedStep(tm)

  This item allows more than two frequency ranges to be supported.

  The optional settings are: [Disabled]; [Enabled].

  When set as **[Enabled]**, user can make further setting in the following item:

  Turbo Mode

  Use this item to enable or disable processor Turbo Mode (requires EMTTM enabled too). Auto means enabled.

  The optional settings are: [Disabled]; [Enabled].

  C states

  Use this item to enable or disable CPU Power Management. Allows CPU to go to C states when it's not 100% utilized.

  The optional settings are: [Disabled]; [Enabled].

  When set as **[Enabled]**, user can make further setting in the following item:

Enhanced C-states

Use this item to enable or disable C1E. When set as [Enabled], CPU will switch to minimum speed when all cores enter C-State.

The optional settings are: [Disabled]; [Enabled].

Package C State Limit

Use this item to select the Maximum Package C State Limit Setting.

The optional settings are: [C0/C1]; [C2]; [C3]; [C6]; [C7]; [C7S]; [C8]; [C9]; [C10]; [CPU Default]; [Auto].

[CPU Default]: Leaves to Factory default value.

[Auto]: Initializes to deepest available Package C State Limit.

- **Intel(R) Time Coordinated Computing**

  Press [Enter] to make settings for the following sub-items:

  Intel(R) TCC Mode

  Use this item to enable or disable Intel(R) TCC mode. When enabled, this will modify system settings to improve real-time performance. The full list of settings and their current state are displayed below when Intel(R) TCC mode is enabled.

  The optional settings are: [Enabled]; [Disabled].

  When set as **[Enabled]**, user can make further setting in the following item:

  Intel(R) TCC Authentication

  Use this item to enable or disable authentication of Intel(R) TCC configuration data.

  The optional settings are: [Disabled]; [Enabled].

  IO Fabric Low Latency

  Use this item to enable or disable IO Fabric Low Latency. This will turn off some power management in the PCH IO fabrics. This option provides the most aggressive IO Fabric performance setting. S3 state is NOT supported.

  The optional settings are: [Disabled]; [Enabled].

  GT CLOS

  Use this item to enable or disable Graphics Technology(GT) Class of Service. Enable will reduce Gfx LLC allocation to minimize impact of Gfx workload on LLC.

  The optional settings are: [Disabled]; [Enabled].

- **Trusted Computing**

Press [Enter] to enable or disable Security Device Support.

TPM 2.0 Device Found

Security Device Support

Use this item to enable or disable BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

The optional settings are: [Disabled]; [Enabled].

When set as **[Enabled]**, user can make further settings in the following items:

SHA-1 PCR Bank

Use this item to enable or disable SHA-1 PCR Bank.

The optional settings are: [Disabled]; [Enabled].

SHA256 PCR Bank

Use this item to enable or disable SHA256 PCR Bank.

The optional settings are: [Disabled]; [Enabled].

SHA384 PCR Bank

Use this item to enable or disable SHA384 PCR Bank.

The optional settings are: [Disabled]; [Enabled].

Pending Operation

Use this item to set an operation for the Security Device.

**Note: Your Computer will reboot during restart in order to change State of Security Device.*

The optional settings are: [None]; [TPM Clear].

- **ACPI Settings**

Press [Enter] to make settings for the following sub-items:

ACPI Settings

ACPI Sleep State

Use this item to select the highest ACPI sleep state the system will enter when the suspend button is pressed.

The optional settings are: [Suspend Disabled]; [S3 (Suspend to RAM)].

► **Super I/O Configuration**

Press [Enter] to make settings for the following sub-items:

Super IO Configuration

► **Serial Port 1 Configuration/Serial Port 2 Configuration**

Press [Enter] to make settings for the following items:

Serial Port

Use this item to enable or disable Serial Port (COM).

The optional settings are: [Disabled]; [Enabled].

When set as **[Enabled]**, user can make further settings in the following items:

Device Settings

Change Settings

Use this item to select an optimal setting for Super IO Device.

The optional settings are: [Auto]; [IO=3F8h; IRQ=4;]; [IO=2F8h; IRQ=3]; [IO=3E8h; IRQ=4]; [IO=2E8h; IRQ=3].

Transmission Mode Select

The optional settings: [RS422]; [RS232]; [RS485].

► **Serial Port 3 Configuration/Serial Port 4 Configuration**

Press [Enter] to make settings for the following items:

Serial Port

Use this item to enable or disable Serial Port (COM).

The optional settings are: [Disabled]; [Enabled].

When set as **[Enabled]**, user can make further settings in the following items:

Device Settings

Change Settings

Use this item to select an optimal setting for Super IO Device.

The optional settings are: [Auto]; [IO=3F8h; IRQ=10;]; [IO=2F8h; IRQ=10]; [IO=3E8h; IRQ=10]; [IO=2E8h; IRQ=10]; [IO=2F0h; IRQ=10]; [IO=2E0h; IRQ=10].

► **Serial Port 5 Configuration/Serial Port 6 Configuration**

Press [Enter] to make settings for the following items:

Serial Port

Use this item to enable or disable Serial Port (COM).

The optional settings are: [Disabled]; [Enabled].

When set as **[Enabled]**, user can make further settings in the following items:

Device Settings

Change Settings

Use this item to select an optimal setting for Super IO Device.
The optional settings are: [Auto]; [IO=3F8h; IRQ=11;]; [IO=2F8h; IRQ=11]; [IO=3E8h; IRQ=11]; [IO=2E8h; IRQ=11]; [IO=2F0h; IRQ=11]; [IO=2E0h; IRQ=11].

ERP Support

Use this item to set Energy-Related Products function.
The optional settings are: [Disabled]; [Enabled].
This item should be set as [**Disabled**] if you wish to have all active wake-up functions.

Case Open Detect

Use this item to detect Case has already open or not. Show message in POST.
The optional settings are: [Disabled]; [Enabled].
When set as **[Enabled]**, system will detect if COPEN has been short or not (*refer to **JPCLR1** jumper setting for Case Open Detection*); if Pin 7&8 of ***JPCLR1*** are short, system will show Case Open Message during POST.

WatchDog Reset Timer

Use this item to enable or disable WDT reset function.
The optional settings: [Disabled]; [Enabled].
When set as **[Enabled]**, the following sub-items shall appear:

WatchDog Reset Timer Value

User can select a value in the range of [4] to [255] seconds when 'WatchDog Reset Timer Unit' set as [Sec]; or in the range of [4] to [255] minutes when 'WatchDog Reset Timer Unit' set as [Min].

WatchDog Reset Timer Unit

The optional settings: [Sec.]; [Min.].

WatchDog Wake-up Timer

This item support WDT wake-up while '**ERP Support**' is set as [Auto].
The optional settings: [Disabled]; [Enabled].
When set as **[Enabled]**, the following sub-items shall appear:

WatchDog Wake-up Timer Value

User can select a value in the range of [10] to [4095] seconds when '**WatchDog Wake-up Timer Unit**' set as [Sec]; or in the range of [1] to [4095] minutes when '**WatchDog Wake-up Timer Unit**' set as [Min].

WatchDog Wake-up Timer Unit

The optional settings are: [Sec.]; [Min.].

ATX Power Emulate AT Power

This item support Emulate AT power function, MB power On/Off control by power supply. Use needs to select 'AT or ATX Mode' on MB jumper at first *(refer to **AT_MODE Pin 1&2** jumper setting for ATX Mode & **Pin 2&3** jumper setting for AT Mode Select).*

- **Serial Port Console Redirection**

Press [Enter] to make settings for the following sub-items:

COM1

Console Redirection

Use this item to enable or disable COM1 Console Redirection.

The optional settings are: [Disabled]; [Enabled].

When set as **[Enabled**], user can make further settings in the '**Console Redirection Settings**' screen:

- **Console Redirection Settings**

The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

Press [Enter] to make settings for the following sub-items：

Terminal Type

The optional settings are: [VT100]; [VT100+]; [VT-UTF8]; [ANSI].

[ANSI]: Extended ASCII char set;

[VT100]: ASCII char set;

[VT100+]: Extends VT100 to support color, function keys, etc.;

[VT-UTF8]: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.

Bits per second

Use this item to select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.

The optional settings are: [9600]; [19200]; [38400]; [57600]; [115200].

Data Bits

The optional settings are: [7]; [8].

Parity

A parity bit can be sent with the data bits to detect some transmission errors.

The optional settings are: [None]; [Even]; [Odd]; [Mark]; [Space].

[Even]: parity bit is 0 if the num of 1's in the data bits is even;

[Odd]: parity bit is 0 if num of 1's in the data bits is odd;

[Mark]: parity bit is always 1;

[Space]: parity bit is always 0;

[Mark] and **[Space]**: parity do not allow for error detection.

Stop Bits

Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.

The optional settings are: [1]; [2].

Flow Control

Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a "stop" signal can be sent to stop the data flow. Once the buffers are empty, a "start" signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.

The optional settings are: [None]; [Hardware RTS/CTS].

VT-UTF8 Combo Key Support

Use this item to enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals.

The optional settings are: [Disabled]; [Enabled].

Recorder Mode

With this mode enable only text will be sent. This is to capture Terminal data.

The optional settings are: [Disabled]; [Enabled].

Resolution 100x31

Use this item to enable or disable extended terminal resolution.

The optional settings are: [Disabled]; [Enabled].

Putty KeyPad

Use this item to select FunctionKey and KeyPad on Putty.

The optional settings are: [VT100]; [LINUX]; [XTERMR6]; [SCO]; [ESCN]; [VT400].

Serial Port for Out-of-Band Management/ Windows Emergency Management Services (EMS)

Console Redirection EMS

Use this item to enable or disable Console Redirection.

The optional settings are: [Disabled]; [Enabled].

When set as **[Enabled]**, user can make further settings in '**Console Redirection Settings**' screen:

▸ **Console Redirection Settings**

The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

Press [Enter] to make settings for the following sub-items.

Out-of-Band Mgmt Port

The default setting is: [COM1].

Terminal Type EMS

The optional settings are: [VT100]; [VT100+]; [VT-UTF8]; [ANSI].

[VT-UTF8] is the preferred terminal type for out-of-band management. The next best choice is **[VT100+]** and then **[VT100]**. See above, in Console Redirection Settings page, for more help with Terminal Type/Emulation.

Bits per second EMS

Use this item to select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.

The optional settings are: [9600]; [19200]; [57600]; [115200].

Flow Control EMS

Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a "stop" signal can be sent to stop the data flow. Once the buffers are empty, a "start" signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.

The optional settings are: [None]; [Hardware RTS/CTS]; [Software Xon/Xoff].

Data Bits

The default setting is: [8].

**This item may or may not show up, depending on different configuration.*

Parity

The default setting is: [None].

**This item may or may not show up, depending on different configuration.*

Stop Bits

The default setting is: [1].

**This item may or may not show up, depending on different configuration.*

► **PC Health Status**

Press [Enter] to view current hardware health status, make further settings in '**SmartFAN Configuration**'.

► **SmartFAN Configuration**

Press [Enter] to make settings for SmartFan Configuration:

SmartFAN Configuration

CPUFAN Smart Mode

The optional settings: [Disabled]; [Enabled].

When set as **[Enabled]**, the following sub-items shall appear:

CPUFAN Full-Speed Temperature

Use this item to set CPUFAN/SYSFAN full speed temperature. Fan will run at full speed when above this pre-set temperature.

CPUFAN Full-Speed Duty

Use this item to set CPUFAN/SYSFAN full-speed duty. Fan will run at full speed when above this pre-set duty.

CPUFAN Idle-Speed Temperature

Use this item to set CPUFAN /SYSFAN idle speed temperature. Fan will run at idle speed when below this pre-set temperature.

CPUFAN Idle-Speed Duty

Use this item to set CPUFAN/SYSFAN idle speed duty. Fan will run at idle speed when below this pre-set duty.

► **USB Configuration**

Press [Enter] to make settings for the following sub-items:

USB Configuration

XHCI Hand-off

This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

The optional settings are: [Enabled]; [Disabled].

USB Mass Storage Driver Support

Use this item to enable or disable USB Mass Storage Driver Support.

The optional settings are: [Disabled]; [Enabled].

USB Hardware Delays and Time-outs

USB Transfer time-out

Use this item to set the time-out value for control, bulk, and interrupt transfers.

The optional settings are: [1 sec]; [5 sec]; [10 sec]; [20 sec].

Device reset time-out

Use this item to set USB mass storage device start unit command time-out.

The optional settings are: [10 sec]; [20 sec]; [30 sec]; [40 sec].

Device power-up delay

Use this item to set maximum time the device will take before it properly reports itself to the host controller. 'Auto' uses default value: for a root port it is 100 ms, for a hub port the delay is taken from hub descriptor.

The optional settings are: [Auto]; [Manual].

Select **[Manual]** you can set value for the following sub-item: '**Device power-up delay in seconds**'**,** the delay range in from 1 to 40 seconds, in one second increments.

► **Network Stack Configuration**

Press [Enter] to go to '**Network Stack**' screen to make further settings.

Network Stack

Use this item to enable or disable UEFI Network Stack.

The optional settings are: [Disabled]; [Enabled].

When set as **[Enabled]**, the following sub-items shall appear:

IPv4 PXE Support

Use this item to enable IPv4 PXE Boot Support. When set as [Disabled], IPv4 PXE boot support will not be available.

The optional settings are: [Disabled]; [Enabled].

IPv6 PXE Support

Use this item to enable IPv6 PXE Boot Support. When set as [Disabled], IPv6 PXE boot support will not be available.

The optional settings are: [Disabled]; [Enabled].

PXE boot wait time

Use this item to set wait time in seconds to press [ESC] key to abort the PXE boot. Use either [+] / [-] or numeric keys to set the value.

Media detect count

Use this item to set number of times the presence of media will be checked. Use either [+] / [-] or numeric keys to set the value.

- **NVMe Configuration**

  Press [Enter] to view current NVMe Configuration.

  ***Note:** options only when NVMe device is available.*

- **Wake-up Function Settings**

  Press [Enter] to make settings for the following sub-items:

  Wake-up System With Fixed Time

  Use this item to enable or disable System wake on alarm event.

  The optional settings are: [Disabled]; [Enabled].

  When set as **[Enabled]**, the following items shall appear:

  Wake-up Hour

  Use this item to select 0-23. For example enter 3 for 3am and 15 for 3pm.

  Wake-up Minute

  Use this item to select 0-59.

  Wake-up Second

  Use this item to select 0-59.

  Wake-up System with Dynamic Time

  Use this item to enable or disable System wake on alarm event.

System will wake on the current time + Increase minute(s).
The optional settings are: [Disabled]; [Enabled].
When set as **[Enabled]**, system will wake on the current time + increased minute(s).

USB Power Gating S4-S5

USB Wake-up is affected by ERP function in S4. Please disable ERP before activating this function in S4.
The optional settings are: [Enabled]; [Disabled].

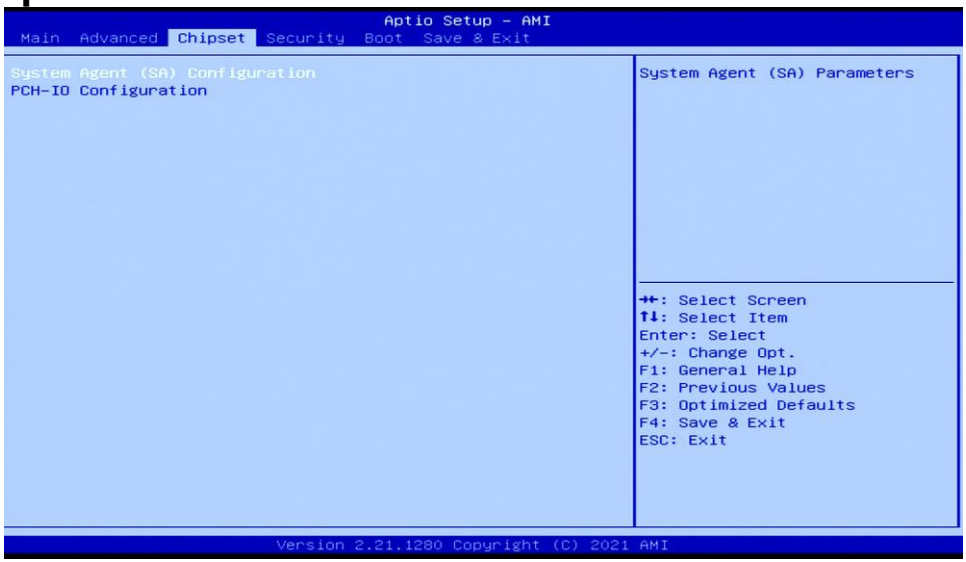
- **PTT Configuration**

  Press [Enter] to make settings for the following sub-items:

  TPM Device Selection

  Use this item to select TPM device.
  The optional settings are: [dTPM]; [PTT].
  [dTPM]: disables PTT in SkuMgr;
  [PTT]: enables PTT in Skumgr.
  Warning! *PTT/dTPM will be disabled and all data saved on it will be lost.*

3-8 Chipset Menu



► **System Agent (SA) Configuration**

Press [Enter] to make settings for the following sub-items:

System Agent (SA) Configuration

GTT Size

Use this item to select the GTT Size.

The optional settings are: [2MB]; [4MB]; [8MB].

DVMT Pre-Allocated

Use this item to select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.

The optional settings are: [0M]; [4M]; [8M]; [12M]; [16M]; [20M]; [24M]; [28M]; [32M]; [36M]; [40M]; [44M]; [48M]; [52M]; [56M]; [60M]; [64M]; [96M]; [128M]; [160M].

DVMT Total Gfx Mem

Use this item to select DVMT 5.0 Total Graphics Memory size used by the Internal Graphics Device.

The optional settings are: [128M]; [256M]; [MAX].

Active LFP

The optional settings are: [Disabled]; [LVDS].

When set as 'Enabled', user can make further settings in '**LVDS Panel Type**'.

LVDS Panel Type

The optional settings are: [800x480; 1ch; 18-bit]; [800x600; 1ch; 18-bit]; [800x600; 1ch; 24-bit]; [1024x600; 1ch; 18-bit]; [1024x768; 1ch; 18-bit]; [1024x768; 1ch; 24-bit]; [1280x768; 1ch; 24-bit]; [1280x800; 1ch; 18-bit]; [1280x800; 1ch; 24-bit]; [1366x768; 1ch; 18-bit]; [1366x768; 1ch; 24-bit]; [1440x900; 2ch; 18-bit]; [1440x900; 2ch; 24-bit]; [1280x1024; 2ch; 24-bit]; [1680x1050; 2ch; 24-bit]; [1920x1080; 2ch; 24-bit].

Backlight Control

Use this item for Back Light Control Setting.

The optional settings are: [PWM Inverted]; [PWM Normal].

► **PCH-IO Configuration**

Press [Enter] to make settings for the following sub-items:

PCH-IO Configuration

PCI Express Configuration

Press [Enter] to make setting for the following item:

Peer Memery Write Enable

Use this item to enable or disable Peer Memory Write.

The optional settings are: [Disable]; [Enabled].

SATA Configuration

Press [Enter] to make settings for the following sub-items:

SATA Configuration

SATA Controller

Use this item to enable or disable SATA device.

The optional settings are: [Disabled]; [Enabled].

SATA Mode Selection

Use this item to determine how SATA controller(s) operate.

The default setting is: [AHCI].

SATA Port

SATA Port

The optional settings are: [Disabled]; [Enabled]

Hot Plug

Use this item to designate this port as Hot Pluggable.

The optional settings are: [Disabled]; [Enabled].

M.2

M.2

The optional settings are: [Disabled]; [Enabled].

HD-Audio Support

Use this item to control Detection of the HD-Audio device.

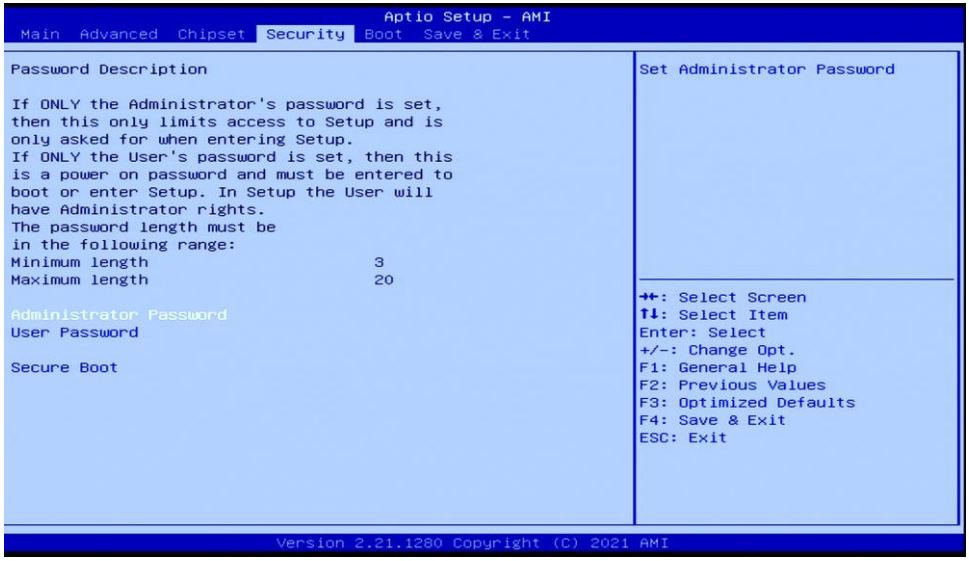
The optional settings: [Disabled]; [Enabled].

System State after Power Failure

Use this item to specify what state to go to when power re-applied after a power failure (G3 state).

The optional settings: [Always On]; [Always Off]; [Former State].

3-9 Security Menu



Security menu allow users to change administrator password and user password settings.

Administrator Password

If there is no password present on system, please press [Enter] to create new administrator password. If password is present on system, please press [Enter] to verify old password then to clear/change password. Press again to confirm the new administrator password.

User Password

If there is no password present on system, please press [Enter] to create new administrator password. If password is present on system, please press [Enter] to verify old password then to clear/change password. Press again to confirm the new administrator password.

- **Secure Boot**

  Press [Enter] to make customized secure settings:

  System Mode

Secure Boot

Secure Boot feature is active if secure boot is enabled, Platform Key(PK) is enrolled and the system is in user mode. The mode change requires platform reset.

The optional settings are: [Disabled]; [Enabled].

Secure Boot Mode

Use this item to Secure Boot mode to Standard mode or Custom mode. This change is effective after save. After reset, this mode will return to Standard mode.

In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication.

The optional settings: [Standard]; [Custom].

When set as [**Custom**], user can make further settings in the following items that show up:

Restore Factory Keys

This item force system to user mode. Install factory default secure boot key databases.

Reset to Setup Mode

Key Management

Press [Enter] to make settings for the following sub-items:

Vendor Keys

Factory Key Provision

This item install factory default Secure Boot keys after the platform reset and while the system is in setup mode.

The optional settings are: [Disabled]; [Enabled].

Restore Factory Keys

This item force system to user mode. Install factory default secure boot key databases.

Enroll Efi Image

This item allows the image to run in Secure Boot mode.

Enroll SHA256 Hash certificate of a PE image into Authorized Signature Database (db).

Device Guard Ready Remove 'UEFI CA' from DB

Restore DB default

This item restore DB variable to factory defaults.

Secure Boot variable/Size/Keys/Key Source

Platform Key(PK)/Key Exchange Keys/Authorized Signatures/Forbidden Signatures/ Authorized TimeStamps/OsRecovery Signatures

Use this item to enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate:
   a) EFI_SIGNATURE_LIST
   b) EFI_ CERT_X509 (DER)
   c) EFI_ CERT_RSA2048 (bin)
   d) EFI_ CERT_SHAXXX
2. Authenticated UEFI Variable
3. EFI PE/COFF Image (SHA256)

Key Source: Factory, External, Mixed.

3-10 Boot Menu

Boot Configuration

Setup Prompt Timeout

Use this item to set number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.

Bootup NumLock State

Use this item to select keyboard NumLock state.

The optional settings: [On]; [Off].

Quiet Boot

Use this item to enable or disable Quite Boot option.

The optional settings: [Disabled]; [Enabled].

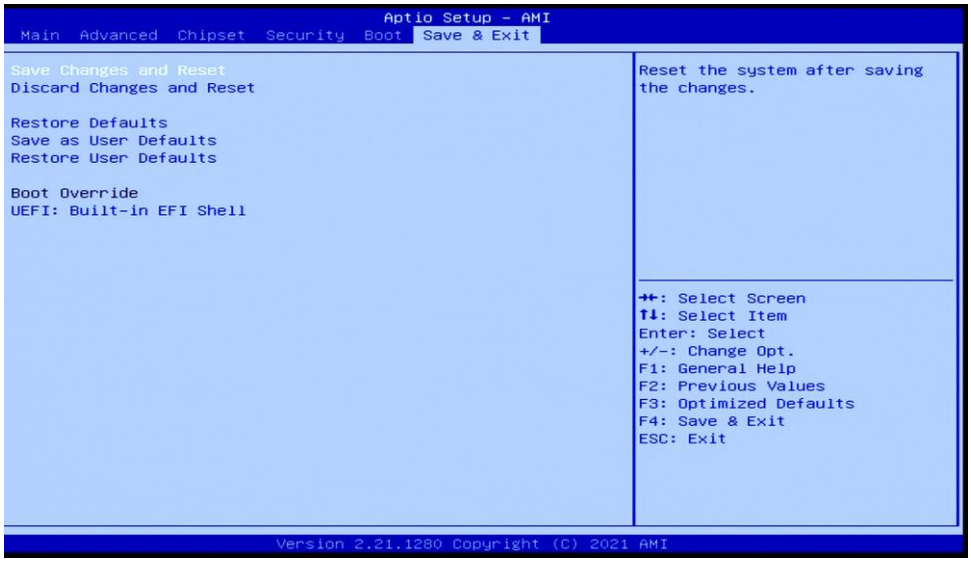
Boot Option Priorities

Boot Option #1

Use this item to decide system boot order.

The optional settings are: [UEFI: Built-in EFI Shell]; [Disabled].

3-11 Save & Exit Menu



Save Options:

Save Changes and Reset

This item allows user to reset the system after saving the changes.

Discard Changes and Reset

This item allows user to reset the system without saving any changes.

Default Options:

Restore Defaults

Use this item to restore /load default values for all the setup options.

Save as User Defaults

Use this item to save the changes done so far as user defaults.

Restore User Defaults

Use this item to restore defaults to all the setup options.

Boot Override

UEFI: Built-in EFI Shell

Press this item to select the device as boot disk after save configuration and reset