MF04E Series

User's Manual

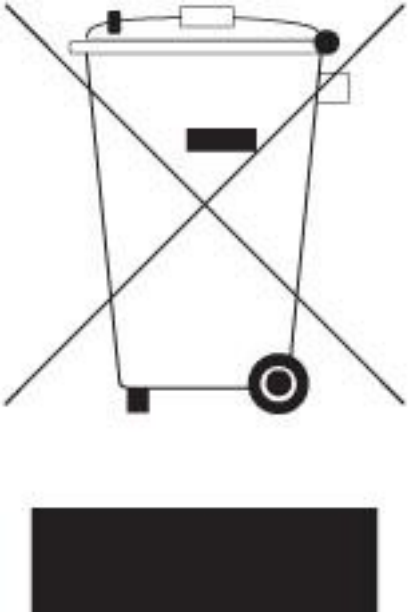
NO.: G03-MF04E-F

Revision: 1.0

Release date: November 15, 2024

Environmental Protection Announcement

Do not dispose of 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 dusty, humidity and temperature extremes. Do not place the product in any area where it may become wet.

- 0 to 60 centigrade is the suitable temperature. (The figure comes from the request of the main chipset)

- 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. Computers should go through an adaptive phase before they boot when it is moved from a cold environment to a warmer one to avoid condensation phenomenon. These water drops attached to 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 the computer. Using the close case may decrease the life of other devices because of the higher temperature in the inner of the case.

- Attention to the heat sink when you over-clock. The higher temperature may decrease the life of the device and burn the capacitor.

USER'S NOTICE

Manual Revision Information

Reversion	Revision History	Date
1.0	First Edition	November 15, 2024

Item Checklist

☑ Motherboard
☑ Cable(s)

Chapter 1
Introduction of the Motherboard

1-1 Feature of Motherboard

- Onboard Intel® Elkhart Lake series SoC processor, with low power consumption never denies high performance.
- Support 2* DDR4 3200MHz SO-DIMM, maximum capacity up to 32GB
- Onboard 2* i226V 2.5GbE RJ-45 LAN ports
- Support 2* HDMI, 1* eDP , 1* LVDS(eDP share with LVDS, either one)
- Onboard 1* M.2 M-key slot, type-2242/2280, support NVME
- Onboard 1* M.2 B-key slot, type-3042
- Onboard 1* M.2 E-key slot, type-2230
- Onboard optional 64GB eMMC (by request)
- Onboard TPM 2.0 (by request)
- Support 1* SATAIII device
- Support 3* USB 3.1(Gen.2) + 5* USB 2.0
- Support 2* COM Ports (COM1 support RS-232/RS-422/RS-485)
- Support CPU Smart FAN
- Compliance with Energy Related Products standard
- Support Watchdog function.
- Solution for Panel PC / IOT Solution / Edge computing

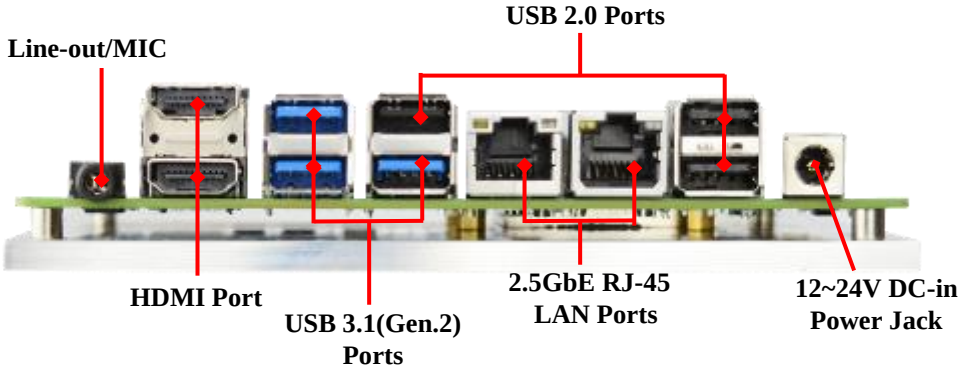
1-2 Specification

Spec	Description
Design	● 3.5” SBC; 8-Layers; PCB size: 14.8x 10.2 cm
Embedded CPU	● Integrated with Intel® Elkhart Lake series CPU (TDP 10W) ** **Note:** CPU model varies from different IPC options. Please consult your dealer for more information onboard CPU.TDP varies depending on CPU.*
Memory Slot	● 2* DDR4 SO-DIMM slot support 2* DDR4 3200MHz SDRAM up to 32GB ** **Note:** Memory clock supporting range is decided by specific CPU of the model. For more memory compatibility information please consult your local dealer.*
Expansion Slot	● 1* M.2 E-key 2230 support USB 2.0/PCIe Gen.3 x1 interface(***M2E***) ● 1* M.2 B-key 3042 support USB 3.1/ USB 2.0 (***M2B***) ● 1* SIM card slot, co-function with M.2 B-key,3042 slot (***SIMCARD***)
Storage	● 1* M.2 M-key 2242/2280 PCIe Gen.3 x2/SATA interface support NVME (***M2M***) ● 1* SATAIII 6Gb/s port ● Onboard 64GB eMMC (***by request***) *****Note:** Onboard eMMC capacity depends on the actual model purchased as technical specifications may update, without prior notice*
LAN Chip	● Integrated with 2* Intel i226V 2.5Gigabit LAN chip, ● Support Fast Ethernet LAN function of providing 10/100/1000/2500Mbps Ethernet data transfer rate. ** **Note: 2500Mbps** high-speed transmission rate is **only** supported over **CAT 5e UTP cable***
Audio Chip	● Realtek AL888S 2-CH HD audio chip
BIOS	● AMI Flash ROM
Rear I/O	● 1* 12~24V DC-in power Jack ● 2* HDMI ports ● 3* USB 3.1(Gen.2) ports ● 3* USB 2.0 ports ● 2* 2.5GbE RJ-45 LAN ports

	● 1* Audio Line-out/MIC port
Internal I/O	● 1* 2-pin internal 12~24V DC-in power connector ● 1* SATA Power-out connector ● 1* CPU FAN connector ● 1* Front panel header ● 1* 9-pin USB 2.0 header (Expansible to 2* USB 2.0 ports) ● 2* Serial port header (COM1 supports RS-232/422/485; COM2 supports RS-232) ● 1* SIM card slot (co-function with M.2 B-key, 3042 slot) ● 1* Front panel audio header ● 1* GPIO header ● 1* eDP connector ● 1* LVDS header ● 1* LVDS inverter header ● 1* SMBUS header
TPM 2.0	● Optional (***by order***)

1-3 Layout Diagram

Rear IO Diagram:



Warning!!

The board has a 12~24V DC-in power connector in I/O back panel and an internal 12~24V power connector**.** Users can only connect one type of compatible power supply to one of them to power the system.

Diagram-Front Side:

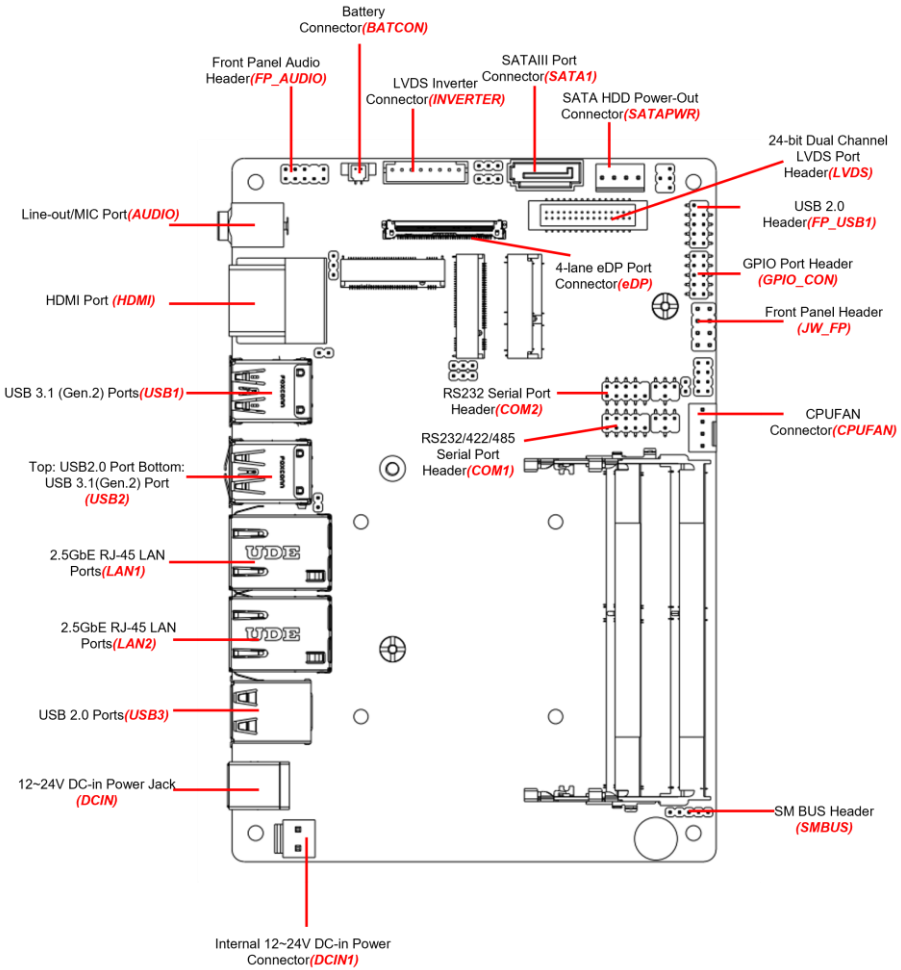
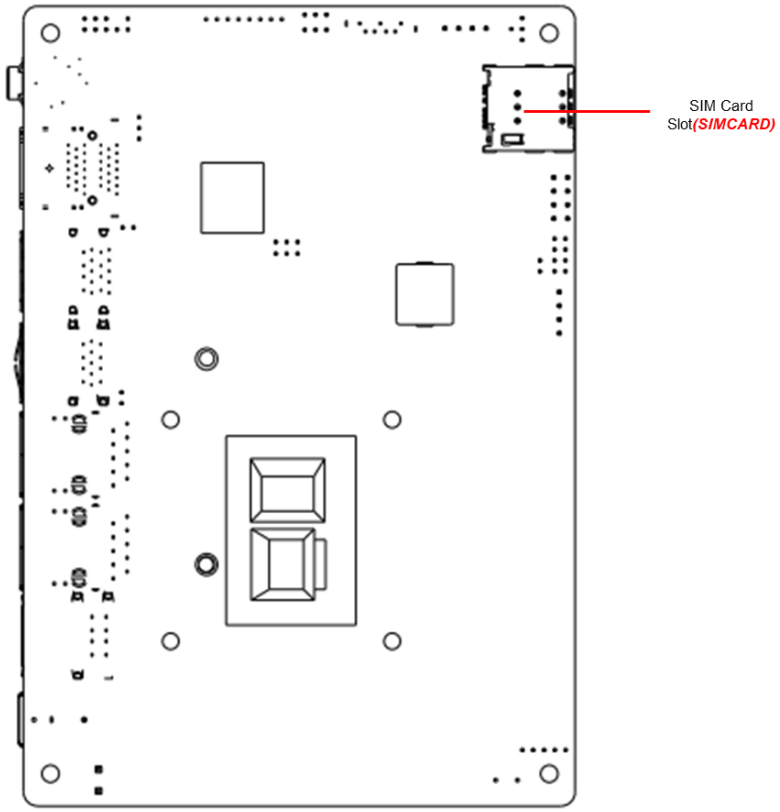
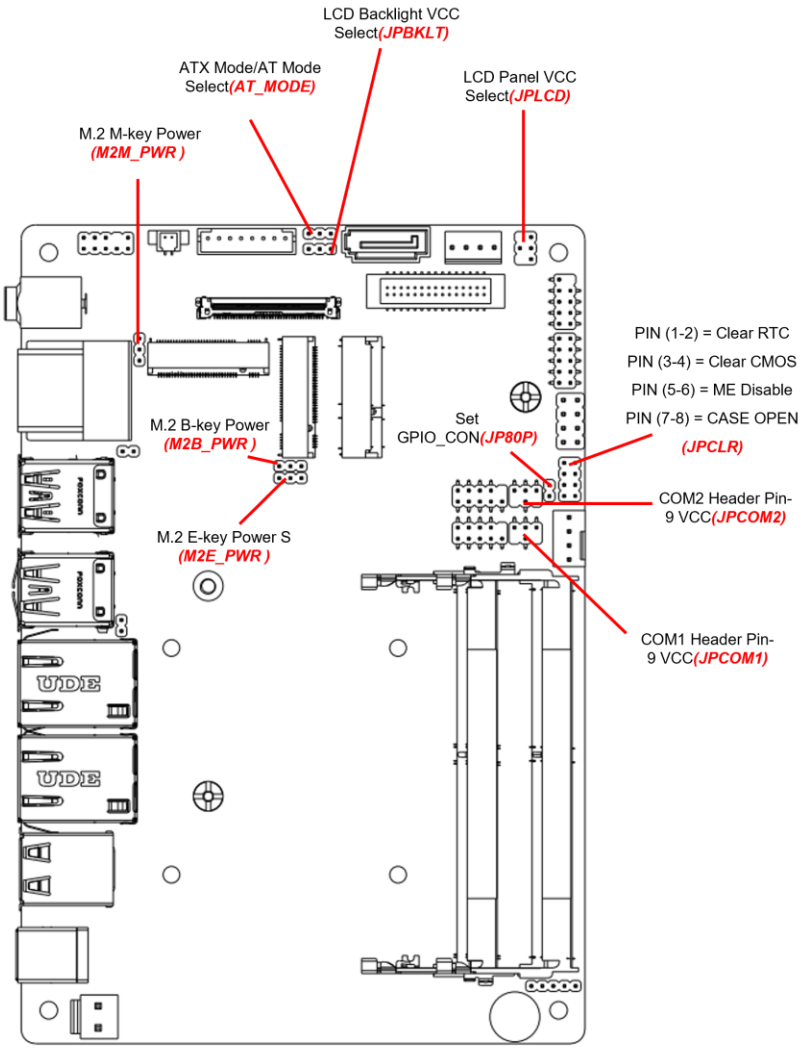


Diagram-Back Side:



**Note: SIM card slot (along with M.2 B-key)*

Jumper Positions:



Jumpers

Jumper	Name	Description
JPCOM1/JPCOM2	COM1/COM2 Header Pin-9 Function	4-Pin Block(2.0 pitch)
JP80P	Set GPIO_CON	2-Pin Block(2.0 pitch)
JPLCD	LCD Panel VCC Power	4-Pin Block(2.0 pitch)
JPBKLT	LCD Backlight Power VCC	3-Pin Block(2.0 pitch)
M2B_PWR	M.2 B-key Power	3-Pin Block(2.0 pitch)
M2E_PWR	M.2 E-key Power	3-Pin Block(2.0 pitch)
M2M_PWR	M.2 M-key Power	3-Pin Block(2.0 pitch)
JPCLR	PIN (1-2) = Clear RTC PIN (3-4) = Clear CMOS PIN (5-6) = Disable ME PIN (7-8) = Case Open	8-Pin Block(2.54 pitch)
AT_MODE	AT/ATX Power Mode	3-Pin Block(2.0 pitch)

Connectors

Connector	Name
DCIN1	Internal 12~24V DC–in Power Connector
USB1	USB 3.1(Gen.2) Port Connector X2
USB2	**Top:** USB 2.0 Port Connector **Bottom:** USB 3.1(Gen.2) Port Connector
USB3	USB 2.0 Port Connector X2
SIMCARD	SIM card slot
HDMI	HDMI Port Connector X2
LAN1/LAN2	2.5GbE RJ-45 LAN Port Connector X2
AUDIO	Audio Line Out/MIC Combo Connector

DCIN	12~24V DC-in Power Jack
SATA1	SATAIII Port Connector
SATAPWR	SATA HDD Power-out Connector
CPUFAN	CPU FAN Connector

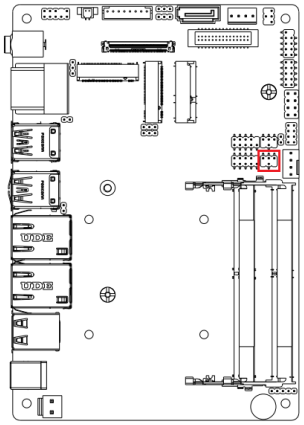
Headers

Header	Name	Description
JW_FP	Front Panel Header (PWR LED/ HDD LED/Power Button /Reset)	8-pin Block(2.54 pitch)
FP_USB1	USB 2.0 Header	9-pin Block(2.0 pitch)
FP_AUDIO	Front Panel Audio Header	9-pin Block(2.0 pitch)
GPIO_CON	GPIO Port Header	10-pin Block(2.0 pitch)
COM1/COM2	Serial Port Header	9-pin Block(2.0 pitch)
eDP	4-lane eDP Port Connector	40-pin Block(1.25 pitch)
LVDS	24-bit Dual Channel LVDS Port Header	30-pin Block(1.25 pitch)
INVERTER	LVDS Inverter	8-pin Block(2.0 pitch)
SMBUS	SM BUS Header	5-pin Block(2.0 pitch)

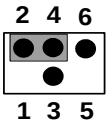
Chapter 2
Hardware Installation

2-1 Jumper Settings

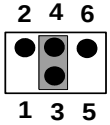
JPCOM1 (4-pin): COM1 Header Pin-9 Function Select (2.0 pitch)



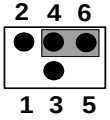
JPCOM1 →COM1 Header Pin-9 VCC
JPCOM2 →COM2 Header Pin-9 VCC



2-4 Closed:
RI=RING

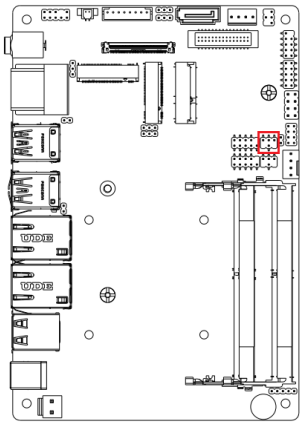


3-4 Closed:
RI= +5V

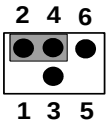


4-6 Closed:
RI= +12V

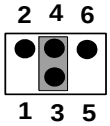
JPCOM2 (4-pin): COM2 Header Pin-9 Function Select (2.0 pitch)



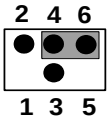
JPCOM1 →COM1 Header Pin-9 VCC
JPCOM2 →COM2 Header Pin-9 VCC



2-4 Closed:
RI=RING

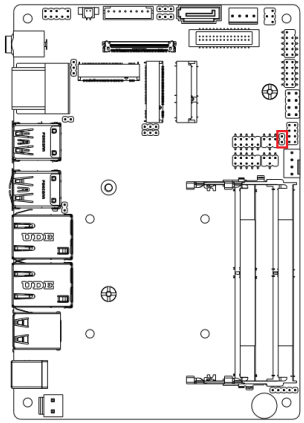


3-4 Closed:
RI= +5V



4-6 Closed:
RI= +12V

JP80P (2-pin): Set GPIO_CON (2.0 pitch)

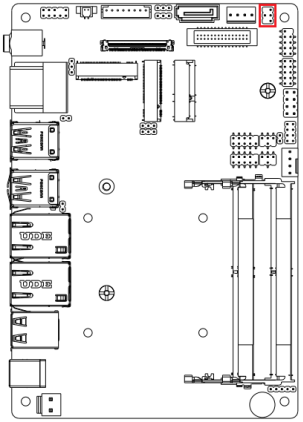


JP80P →Set GPIO_CON

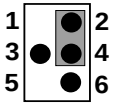
1-2 Open:
GPIO_CON=80 Port

1-2 Closed:
GPIO_CON=
GPIO Port (Default)

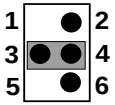
JPLCD (4-pin): LCD Panel VCC Power Select (2.0 pitch)



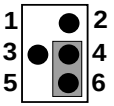
JPLCD→LCD Panel VCC Select



2-4 Closed:
VCC= +3.3V

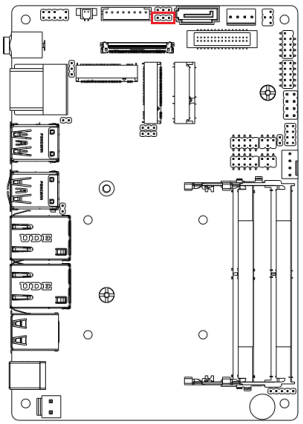


3-4 Closed:
VCC= +5V



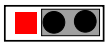
4-6 Closed:
VCC= +12V

JPBKLT (3-pin): LCD Backlight VCC Select (2.0 pitch)



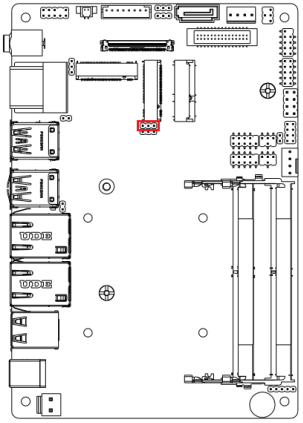
JPBKLT→LCD Backlight

1-2 Closed: 5V;

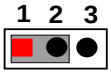


2-3 Closed: 12V

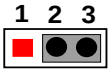
M2B_PWR (3-pin): M.2 B-key Power Select (2.0 pitch)



M2B_PWR→M.2 B-key Power

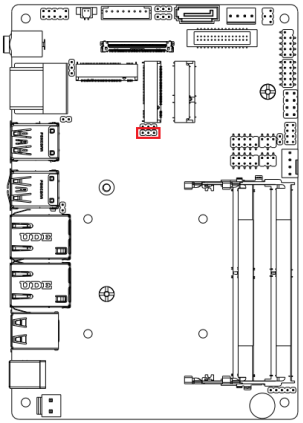


1-2 Closed:
VCC= VCC3

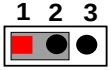


2-3 Closed:
VCC= 3VSB

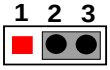
M2E_PWR (3-pin): M.2 E-key Power Select (2.0 pitch)



M2E_PWR→M.2 E-key Power

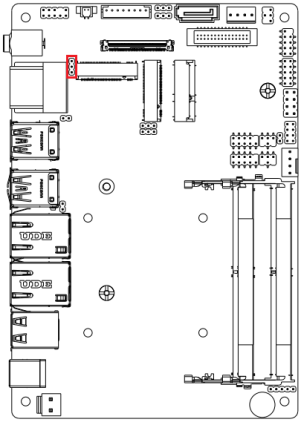


1-2 Closed:
VCC= VCC3

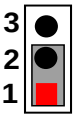


2-3 Closed:
VCC= 3VSB

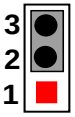
M2M_PWR (3-pin): M.2 M-key Power Select (2.0 pitch)



M2M_PWR→M.2 M-key Power

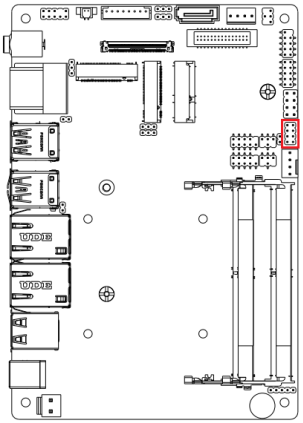


1-2 Closed:
VCC= VCC3

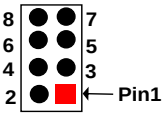


2-3 Closed:
VCC= 3VSB

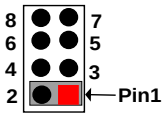
PIN(1-2) of JPCLR (8-pin): Clear RTC (2.0 pitch)



PIN(1-2): Clear RTC

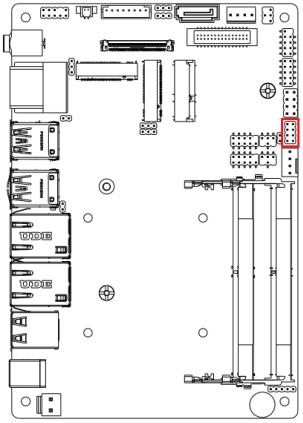


1-2 Open: Normal(Default)

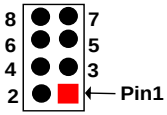


1-2 Closed: Clear RTC

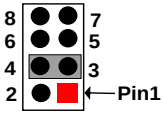
PIN(3-4) of JPCLR (8-pin): Clear CMOS (2.0 pitch)



PIN(3-4): Clear CMOS



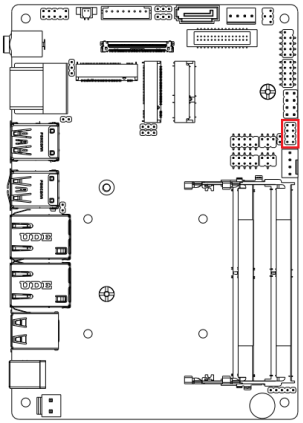
3-4 Open: Normal(Default)



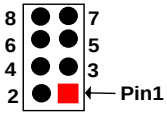
3-4 Closed: Clear CMOS

***Note:** Due to Intel MRC Code design factor, the first reboot after Clear CMOS will run a full **Memory Sizing**, and the boot time will take about **40** seconds (normal reboot time length, not function failure).*

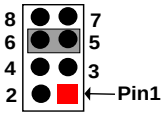
PIN(5-6) of JPCLR (8-pin): Disable ME (2.0 pitch)



PIN(5-6): ME Disable

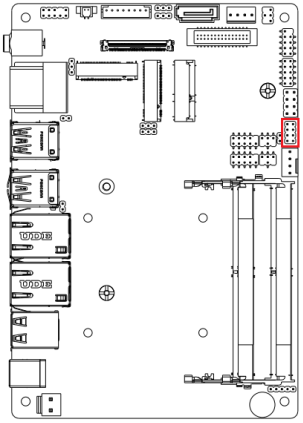


5-6 Open: Normal(Default)

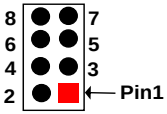


5-6 Closed: ME Disable

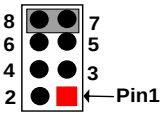
PIN(7-8) of JPCLR (8-pin): Case Open (2.0 pitch)



PIN(7-8): Case Open



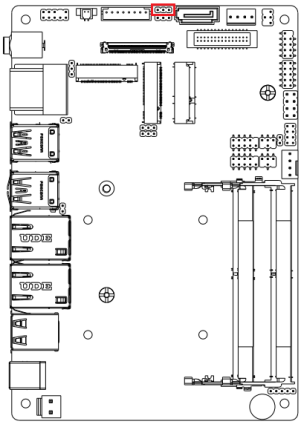
7-8 Open: Normal(Default)



7-8 Closed: Case Open

Pin (7-8) Closed: *When Case open function pin short to GND, the Case open function was detected. When used, needs to enter BIOS and enable '**Case Open Detect**' function. In this case, if your case is removed, next time you restart your computer, a message will be displayed on screen to inform you of this.*

AT_MODE (3-PIN): ATX MODE/AT MODE SELECT (2.0 PITCH)



AT_MODE→ATX/AT Mode Select

1-2 Closed: ATX Mode Selected;

2-3 Closed: AT Mode Selected.

2-2 Connectors and Headers

2-2-1 Connectors

(1) Rear I/O Connectors

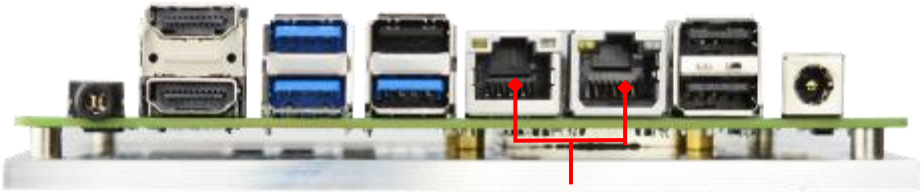
**** Refer to Page-3 Rear IO Diagram.***

Icon	*Name*	*Function*
	**12~24V DC-in Power Jack**	For user to connect compatible power adapter to provide power supply for the system.
	**USB 3.1(Gen.2) Port**	To connect USB keyboard, mouse or other devices compatible with USB 3.1(Gen.2) specification. Ports support up to 5Gbps data transfer rate.
	**USB 2.0 Port**	To connect USB keyboard, mouse or other devices compatible with USB specification.
	****SIM Card Slot***	For user to install compatible SIM card.
	**HDMI Port**	**HDMI port:** to connect display device that support HDMI specification.
	**2.5GbE RJ-45 LAN Port**	This connector is standard 2.5Gbps RJ-45 LAN jack for Network connection. ***(*Note: 2.5Gbps** is **only** supported with **CAT 5e UTP cable).***
	**Line-Out Connector**	For user to connect external speaker, earphones, etc to transfer system audio output.

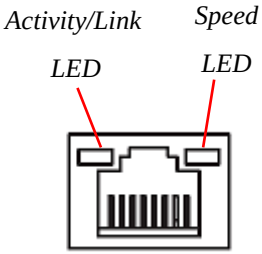
****Note:** SIM card is supported when **M2B (M.2 B-Key 3042)** slot is installed with 3G/4G/LTE card.*

(2) RJ-45 Ethernet Connector

*** There are two LED next to the LAN port. Please refer to the table below for the LAN port LED indications.*



For 2.5GbE RJ-45 LAN port:



Activity/Link LED

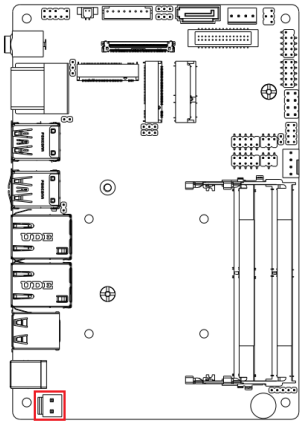
Status	Description
Off	No Link
Blinking	Data Activity
On	Link

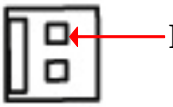
Speed LED

Status	Description
Off	10/100Mbps connection
Orange	1Gbps connection
Green	2.5Gbps connection

** **Note: 2.5Gbps** high-speed transmission rate is **only** supported over **CAT 5e UTP cable**.*

(3) DCIN1 (2-pin) : Internal 12~24V DC-in Power Connector



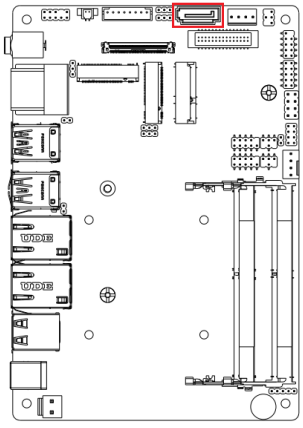


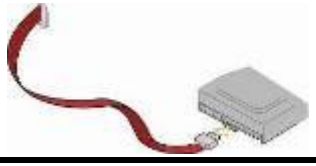
Pin No.	Definition
1	+12V~24VC DC-In
2	GND

Warning: *Find Pin-1 position before connecting power cable to this 2-pin power connector.* ***Please confirm whether the connector and direction are correct before installation.***

(4) SATA1 (7-pin): SATAIII Port connector

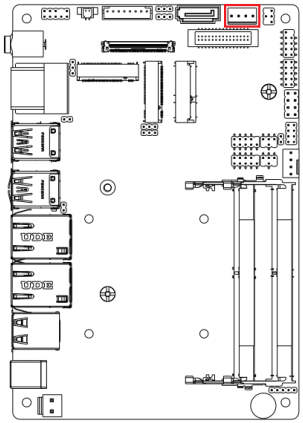
This is a high-speed SATAIII port that supports 6GB/s transfer rate.

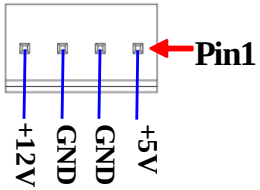




Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

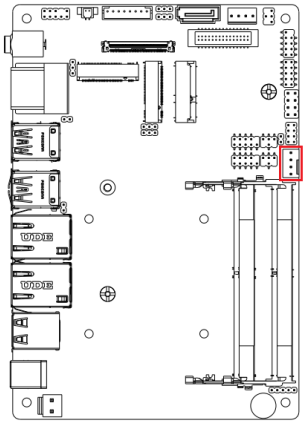
(5) SATAPWR (4-pin): SATA HDD Power-Out Connector

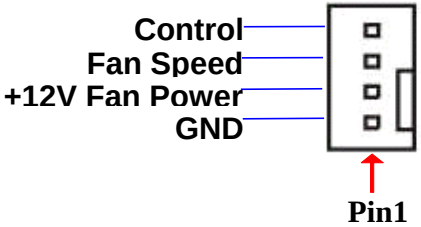




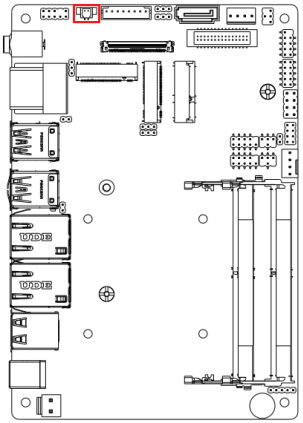
Warning: *Make sure that Pin-1 of compatible SATA Power out connector is inserted into corresponding Pin-1 of* ***SATAPWR*** *connector to avoid possible damage to the board and hard disk drive!*

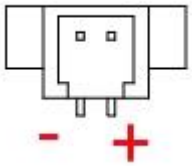
(6) CPUFAN (4-pin): CPU FAN Connector





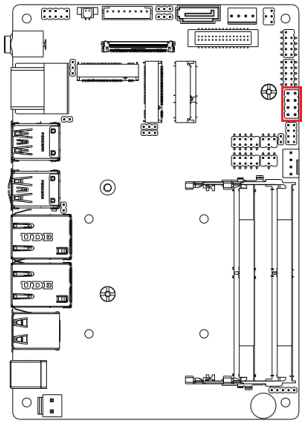
(7) BATCON (2-pin): Battery Connector

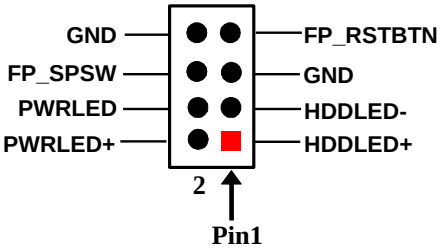




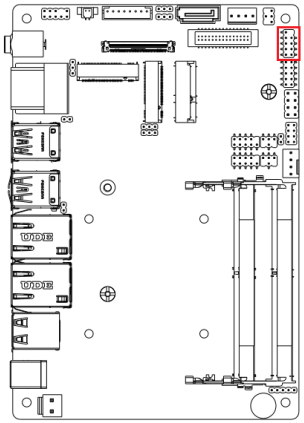
2-2-2 Headers

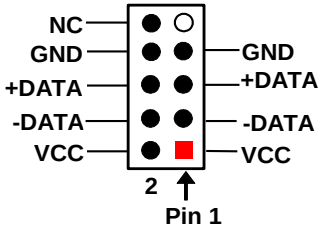
JW_FP (8-pin): Front Panel Header (2.54 pitch)





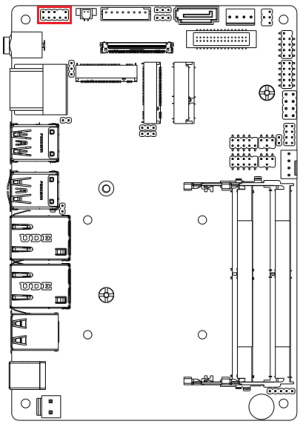
FP_USB1 (9-pin): USB 2.0 Port Header (2.0 pitch)

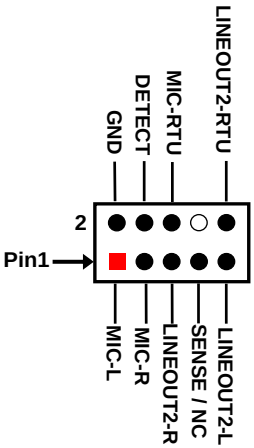




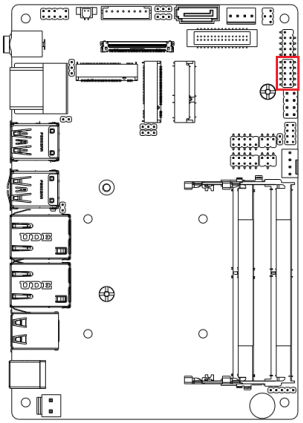
FP_AUDIO (9-pin): Front Panel Audio Header (2.0 pitch)

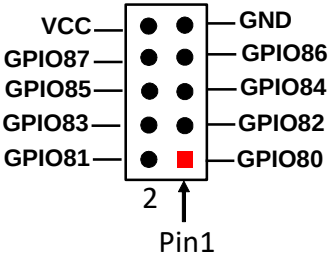
This header connects to Front Panel Line-out, MIC-In connector with cable.





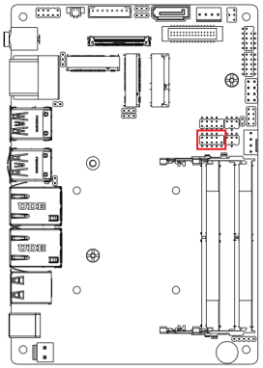
GPIO_CON (10-pin): GPIO Port Header (2.0 pitch)



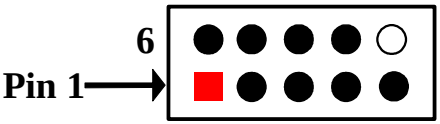


COM1/COM2 (9-pin): Serial Port Headers (2.0 pitch)

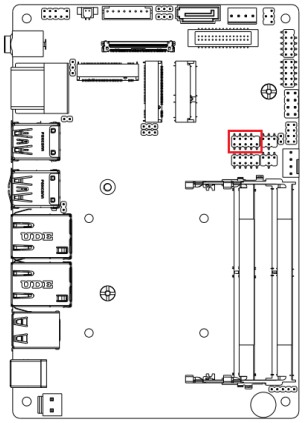
COM1: RS-232/422/485 Serial Port Header.



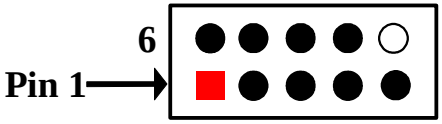
Pin NO.	RS-232	*RS-422 (COM1)	*RS-485 (COM1)
Pin 1	DCD	TX-	DATA-
Pin 2	SIN-	TX+	DATA+
Pin 3	SO-	RX+	NC
Pin 4	DTR-	RX-	NC
Pin 5	GND	GND	GND
Pin 6	DSR-	NC	NC
Pin 7	RTS-	NC	NC
Pin 8	CTS-	NC	NC
Pin 9	RI-	NC	NC



COM2: RS-232 Serial Port Header.

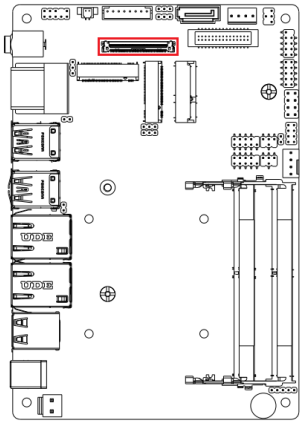


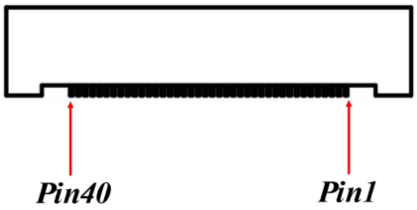
Pin NO.	RS-232	**RS-422 (COM1)*	**RS-485 (COM1)*
Pin 1	**DCD**	TX-	DATA-
Pin 2	**SIN-**	TX+	DATA+
Pin 3	**SO-**	RX+	NC
Pin 4	**DTR-**	RX-	NC
Pin 5	**GND**	GND	GND
Pin 6	**DSR-**	NC	NC
Pin 7	**RTS-**	NC	NC
Pin 8	**CTS-**	NC	NC
Pin 9	**RI-**	NC	NC



****Note: COM1 header can function as RS-232/422/485 port header.*** *In normal settings COM1 functions as RS-232 header. Users also need to go to BIOS to set '**Transmission Mode Select'** for COM1 at first, before using specialized cable to connect different pins of this port.*

eDP (40-pin): 4-lane eDP Port Connector(1.25 pitch)

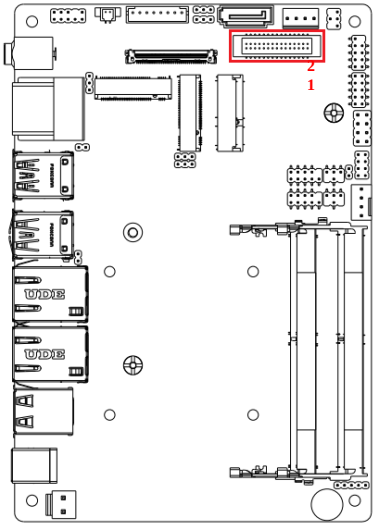


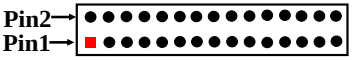


Pin Define	Pin No.	Pin No.	Pin Define
NC	Pin 1	Pin 21	VCC
GND	Pin 2	Pin 22	NC
LANE3_N	Pin 3	Pin 23	GND
LANE3_P	Pin 4	Pin 24	GND
GND	Pin 5	Pin 25	GND
LANE2_N	Pin 6	Pin 26	GND
LANE2_P	Pin 7	Pin 27	HPD
GND	Pin 8	Pin 28	GND
LANE1_N	Pin 9	Pin 29	GND
LANE1_P	Pin 10	Pin 30	GND
GND	Pin 11	Pin 31	GND
LANE0_N	Pin 12	Pin 32	BKLT_ENABLE
LANE0_P	Pin 13	Pin 33	BKLT_PWR DIM
GND	Pin 14	Pin 34	NC
AUX_P	Pin 15	Pin 35	NC

AUX_N	Pin 16	Pin 36	BKLT_PWR
GND	Pin 17	Pin 37	BKLT_PWR
VCC	Pin 18	Pin 38	BKLT_PWR
VCC	Pin 19	Pin 39	BKLT_PWR
VCC	Pin 20	Pin 40	NC

LVDS (30-pin): 24-bit Dual Channel LVDS Port Header (1.25 pitch)

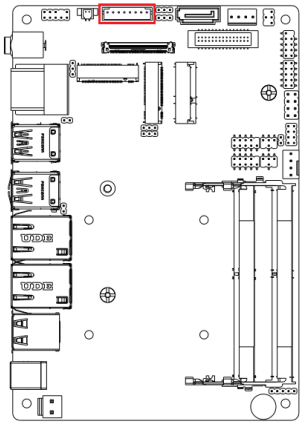




Pin Define	Pin NO.	Pin NO.	Pin Define
LCD_VCC	Pin 30	Pin 29	LCD_VCC
LCD_VCC	Pin 28	Pin 27	LCD_VCC
LVDSA_DATAN0	Pin 26	Pin 25	LVDSA_DATAP0
LVDSA_DATAN1	Pin 24	Pin 23	LVDSA_DATAP1
LVDSA_DATAN2	Pin 22	Pin 21	LVDSA_DATAP2
LVDS_CLKAN	Pin 20	Pin 19	LVDS_CLKAP

LVDSA_DATAN3	Pin 18	Pin 17	LVDSA_DATAP3
GND	Pin 16	Pin 15	GND
GND/LVDS_DETECT	Pin 14	Pin 13	GND
CH_SCL	Pin 12	Pin 11	CH_SDA
LVDSB_DATAP0	Pin 10	Pin 9	LVDSB_DATAN0
LVDSB_DATAP1	Pin 8	Pin 7	LVDSB_DATAN1
LVDSB_DATAP2	Pin 6	Pin 5	LVDSB_DATAN2
LVDS_CLKBP	Pin 4	Pin 3	LVDS_CLKBN
LVDSB_DATAP3	Pin 2	Pin 1	LVDSB_DATAN3

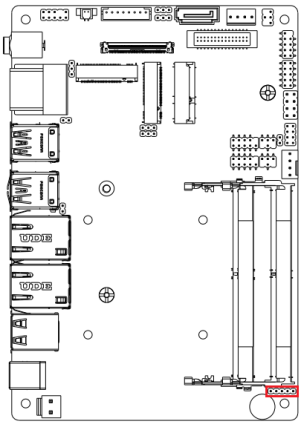
INVERTER (8-pin): LVDS Inverter Connector (2.0 pitch)

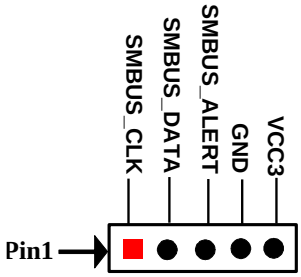


Pin No.	Definition
1	LCD_BKLT_EN
2	LCD_BKLT_PWM
3	Backlight VCC
4	Backlight VCC
5	GND
6	GND
7	BRTNSS_UP
8	BRTNSS_DOWN

Warning! *Find* ***Pin-1*** *location of the inverter and make sure that the installation direction is correct! Otherwise, it may damage the board/display panel!!*

SMBUS (5-pin): SM BUS Header (2.0 pitch)





Chapter 3
Introducing BIOS

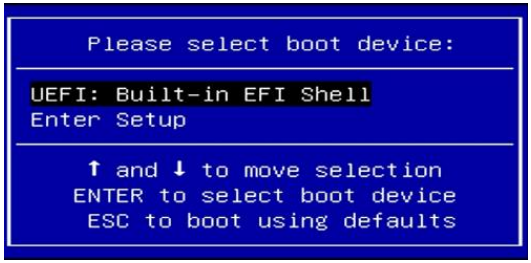
Notice!	The BIOS options in this manual are for reference only. Different configurations may lead to difference in BIOS screen and BIOS screens in manuals are usually the first BIOS version when the board is released and may be different from your purchased motherboard. Users are welcome to download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

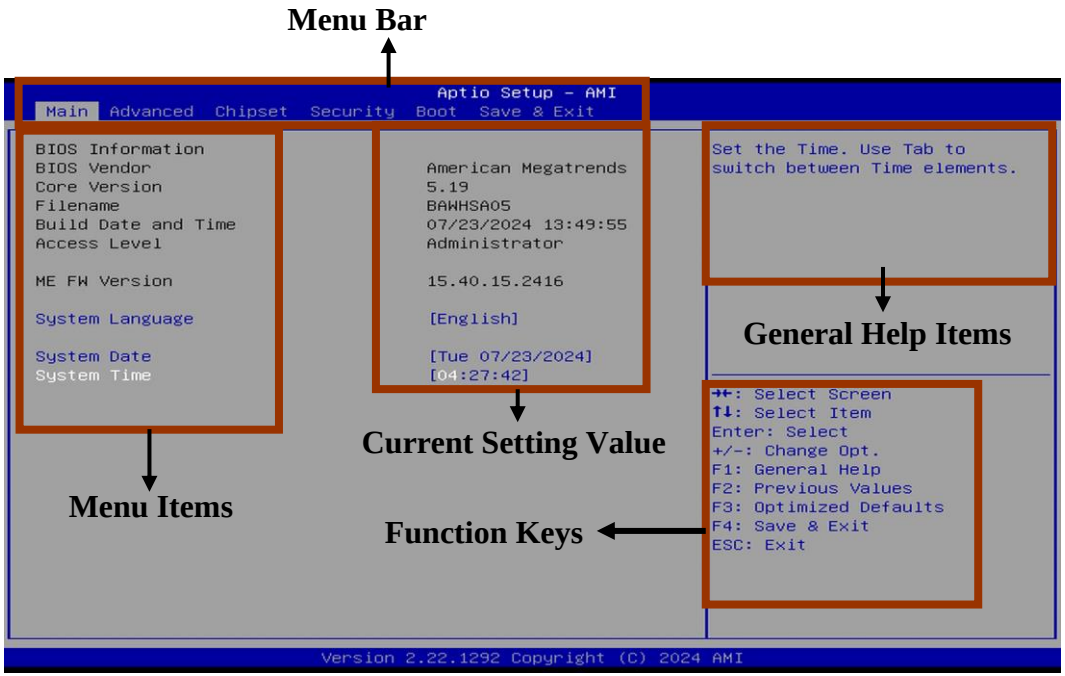
If the message disappears before your respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the “RESET” button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt> and <Delete> keys. If you do not press the keys at 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.



BIOS Boot Menu Screen (boot device options please refer to actual configuration)

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

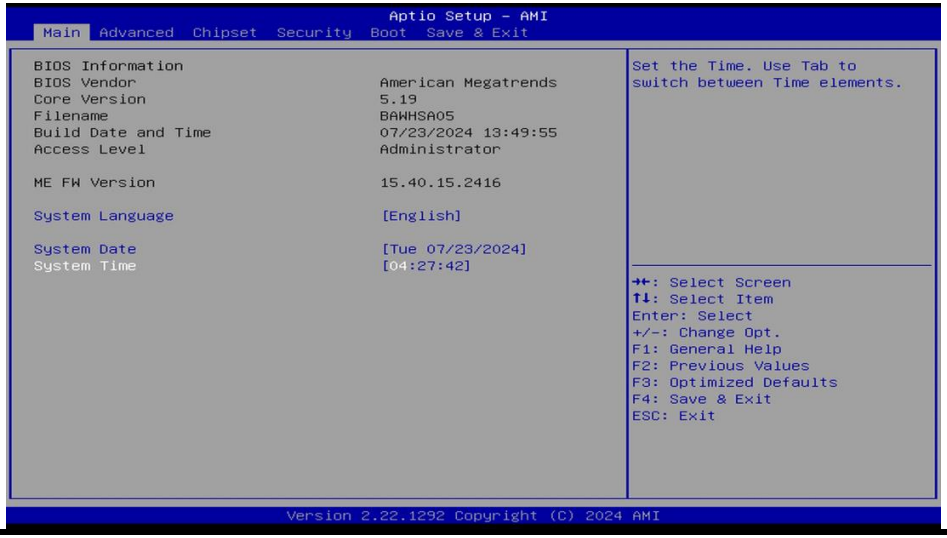
There are six menu bars on top of BIOS screen:

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

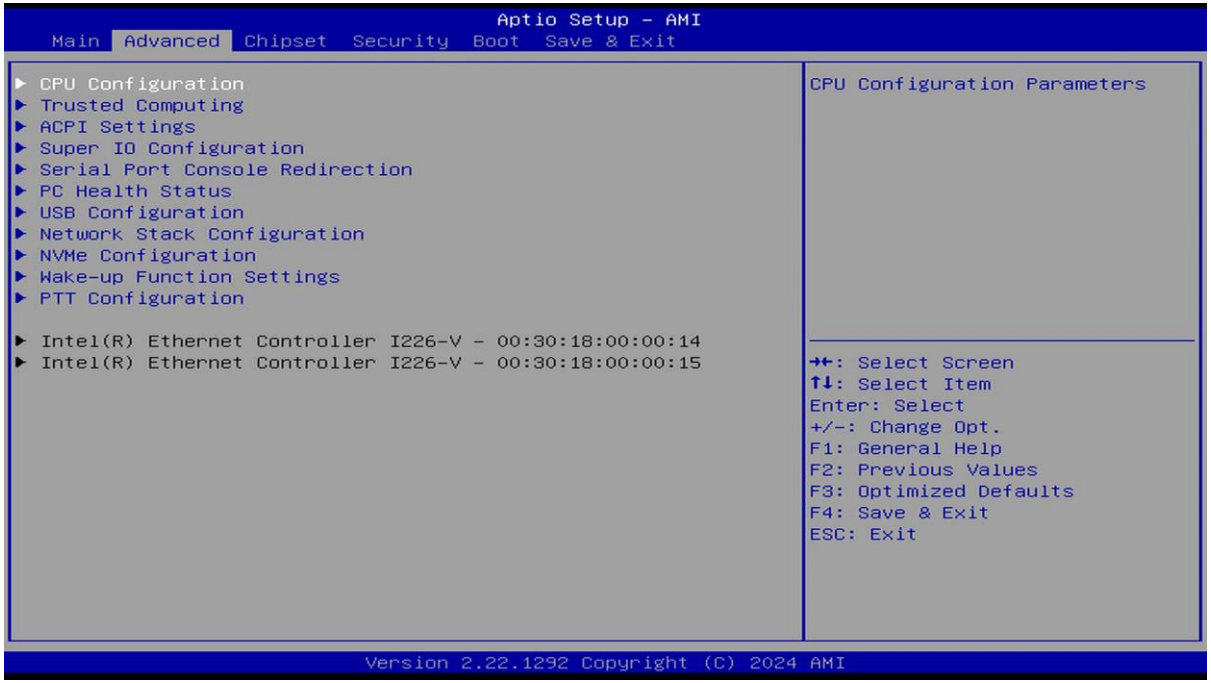
Main menu screen includes some basic system information. Highlight the item and then use the **<+>** or **<->** and numerical keyboard keys to select the value you want in each item.



System Language
Choose the system default language.

System Date
Set the date. Please use [Tab] to switch between date elements.
System Time
Set the time. Please use [Tab] to switch between time elements.

3-7 Advanced Menu



- **CPU Configuration**
  Press [Enter] to view current CPU configuration and make settings for the following sub-items:

Boot Performance Mode

Use this item to select the performance state that the BIOS will set starting from reset vertor.

Boot Performance Mode Set the default value to: [Max Non-Turbo Performance]

The optional settings: [Max Battery]; [Max Non-Turbo Performance]; [Turbo Performance]

Intel(R) SpeedStep(tm)

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

Intel(R) SpeedStep(tm) Set the default value to: [Enabled]

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

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

Turbo Mode

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

Turbo Mode Set the default value to: [Disabled]

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

C states

Use this item to enable or disable CPU Power Management. When set as [Enabled], it allows CPU to go to C states when it's not 100% utilized.

C states Set the default value to: [Enabled]

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

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

Enhanced C-states

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

Enhanced C-states Set the default value to: [Enabled]

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

Package C State Limit

Use this item to set maximum package C State limit. When set as [CPU default], it leaves to Factory default value. When set as [Auto], it initializes to deepest available package C State Limit.

Set the default value to: [Auto]

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

Power Limit1 Override

Use this item to enable/disable Power Limit1 override. If this option is disabled, BIOS will program the default values for Power Limit1 and Power Limit1 time window.

Power Limit1 Override Set the default value to: [Disabled]

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

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

Power Limit1

Power Limit1 in Milli Watts. BIOS will round to the nearest 1/8W when programming. 0= no custom override. For 12.50W, enter 12500. Overclocking SKU:Value must be between Max and min Power Limits (specified by PACKAGE_POWER_SKU_MSR). Other SKUs: This value must be between Min Power Limit and TDP Limit. If value is 0, BIOS will program TDP value.

Power Limit1 Time Window

Power Limit1 Time Window value in seconds. The value (28 sec for Mobile and 8 sec for Desktop). Defines time window which TDP value should be maintained.

The optional settings: [0]; [1] [2]; [3]; [4]; [5]; [6]; [7]; [8]; [10]; [12]; [14]; [16]; [20]; [24]; [28]; [32]; [40]; [48]; [56]; [64]; [80]; [96]; [112]; [128];

Power Limit2 Override

Use this item to enable/disable power Limit2 override. If this option is disabled, BIOS will program the default values for power Limit2

Power Limit2 Override Set the default value to: [Enabled]

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

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

Power Limit2

Power Limit2 value in Milli Watts. BIOS will round to the nearest 1/8W when programming. If the value is 0, BIOS will program this value as 1.25*TDP. For 12.50W, enter 12500. Processor applies control policies such that the package

power does not exceed this limit.

- **Trusted Computing**

Press [Enter] to view current status information, or make further settings in the following sub-items:

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.

Security Device Support Set the default value to: [Enabled]

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

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

Active PCR Banks

Available PCR Banks

SHA256 PCR Bank

Use this item to enable or disable SHA256 PCR Bank.

SHA256 PCR Bank Set the default value to: [Enabled]

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

SHA384 PCR Bank

Use this item to enable or disable SHA384 PCR Bank.

SHA384 PCR Bank Set the default value to: [Disabled]

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

When PTT configuration > TPM Device Selection set as [PTT] , user can make

Pending operation

Use this item to schedule an Operation for the Security Device.

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

Pending operation Set the default value to: [None]

The optional settings: [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.

  ACPI Sleep State Set the default value to: [S3 (Suspend to RAM)]

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

- **Super IO Configuration**

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

  Super IO Configuration

  - **Serial Port 1 Configuration**

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

    Serial Port 1 Configuration

    Serial Port

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

    Set the default value to: [Enabled].

    The optional settings: [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.

    Set the default value to: [Auto].

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

    Transmission Mode Select

    Set the default value to: [RS-232].

    The optional settings: [RS-422]; [RS-232]; [RS-485].

    Mode Speed Select

Use this item to select RS-232/RS422/RS485 Speed.
Set the default value to: [RS-232=1Mbps, RS-422/RS-485=10Mbps]
The optional settings: [RS-232/RS-422/RS-485=250Kbps]; [RS-232=1Mbps, RS-422/RS-485=10Mbps].

► **Serial Port 2 Configuration**

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

Serial Port 2 Configuration

Serial Port

Use this item to enable or disable Serial Port (COM).
Set the default value to: [Enabled].
The optional settings: [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.
Set the default value to: [Auto].
The optional settings: [Auto]; [IO=3F8h; IRQ=4;]; [IO=2F8h; IRQ=3;]; [IO=3E8h; IRQ=4;]; [IO=2E8h; IRQ=3;];.

ERP Support

Use this item to select Energy-Related Products function. This item should be set as [Disabled] if you wish to have all active wake-up functions.
ERP Support Set the default value to: [Disabled].
The optional settings: [Disabled]; [Enable].

Case Open Detect

Use this item to detect case has already open or not, show message in POST.
Case Open Detect Set the default value to: [Disabled]
The optional settings: [Disabled]; [Enabled].
When set as [Enabled], system will detect if COPEN has been short or not (refer to Page 14); if Pin 7&8 of JPCLR is short, system will show Case Open Message during POST.

WatchDog Reset Timer
Use this item to enable or disable WDT reset function.
WatchDog Reset Timer Set the default value to: [Disabled]
The optional settings: [Disabled]; [Enable].
When set as **[Enabled]**, the following sub-items shall appear:
WatchDog Reset Timer Value
User can select a value in the range of [10] to [255] seconds when 'WatchDog Reset Timer Unit' set as [Sec]; or in the range of [1] to [255] minutes when 'WatchDog Reset Timer Unit' set as [Min].
WatchDog Reset Timer Unit
The optional settings: [Sec.]; [Min.].
WatchDog Wake-up Timer
Use this item to enable or disable WDT wake-up function.
WatchDog Wake-up Timer Set the default value to: [Disabled]
The optional settings: [Disabled]; [Enable].
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 Reset Timer Unit' set as [Sec]; or in the range of [1] to [4095] minutes when 'WatchDog Reset Timer Unit' set as [Min].
WatchDog Wake-up Timer Unit
The optional settings: [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 (AT-MODE setting Pin 1&2 of for ATX Mode & Pin 2&3 of AT Mode Select)

- **Serial Port Console Redirection**

COM1
Console Redirection
Use this item to enable or disable Console Redirection.
Console Redirection Set the default value to: [Disabled]

The optional settings: [Disabled]; [Enabled].
When set as **[Enabled]**, user can make further settings in the following items:

- **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.

COM1
Console Redirection Settings

Terminal Type
Terminal Type Set the default value to: [ANSI]
The optional settings: [VT100]; [VT100+]; [VT-UTF8]; [ANSI].
Emulation: **[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.
Bits per second Set the default value to: [115200]
The optional settings: [9600]; [19200]; [38400]; [57600]; [115200].
Data Bits
Data Bits Set the default value to: [8]
The optional settings: [7]; [8].
Parity
A parity bit can be sent with the data bits to detect some transmission errors.
Parity Set the default value to: [None].
The optional settings: [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.

Stop Bits Set the default value to: [1]

The optional settings: [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.

Flow Control Set the default value to: [None]

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

VT-UTF8 Combo Key Support

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

VT-UTF8 Combo Key Support Set the default value to: [Enabled]

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

Recorder Mode

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

Recorder Mode Set the default value to: [Disabled]

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

Resolution 100x31

Use this item to enable or disable extended terminal resolution.

Resolution 100x31 Set the default value to: [Disabled]

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

Putty KeyPad

Use this item to select FunctionKey and KeyPad on Putty.

Putty KeyPad Set the default value to: [VT100]

The optional settings: [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.
Console Redirection EMS Set the default value to: [Disabled]
The optional settings: [Disabled]; [Enabled].
When set as **[Enabled]**, the following sub-items shall appear:

- **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 items:

Out-of-Band Mgmt Port

Terminal Type EMS

Terminal Type EMS Set the default value to: [VT-UTF8]
The optional settings: [VT100]; [VT100+]; [VT-UTF8]; [ANSI].
[VT-UTF8] is the preferred terminal type for out-of-band management. The next best choice is [VT100+] and them [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.
Bits per second EMS Set the default value to: [115200]
The optional settings: [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.
Flow Control EMS Set the default value to: [None]
The optional settings: [None]; [Hardware RTS/CTS]; [Software Xon/Xoff].

Data Bits EMS

The default setting is: [8].
**This item may or may not show up, depending on different configuration.*

Parity EMS

The default setting is: [None].
**This item may or may not show up, depending on different configuration.*

Stop Bits EMS

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**

CPUFAN Smart Mode

Set the default value to: [Enabled]

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

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

CPUFAN Full-Speed Temperature

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

CPUFAN Full-Speed Temperature Set the default value to:[75]

CPUFAN Full-Speed Duty

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

CPUFAN Full-Speed Duty Set the default value to:[100]

CPUFAN Idle-Speed Temperature

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

CPUFAN Idle-Speed Temperature Set the default value to:[40]

CPUFAN Idle-Speed Duty

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

CPUFAN Idle-Speed Duty Set the default value to:[40]

- **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.

XHCI Hand-off Set the default value to: [Enabled]

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

USB Mass Storage Driver Support

Use this item to enable or disable USB mass storage driver support.

USB Mass Storage Driver Support Set the default value to: [Enabled]

The optional settings: [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.
USB transfer time-out Set the default value to: [20 sec].
The optional settings: [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.
Device reset time-out Set the default value to: [20 sec].
The optional settings: [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.
Device power-up delay Set the default value to: [Auto]
The optional settings: [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.
Network Stack Set the default value to: [Disabled]
The optional settings: [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 boot support will not be available.
IPv4 PXE Support Set the default value to: [Enabled].
The optional settings: [Disabled]; [Enabled].

IPv6 PXE Support
Use this item to enable IPv6 PXE boot support. When set as [Disabled], IPv6 boot support will not be available.
IPv6 PXE Support Set the default value to: [Disabled]
The optional settings: [Disabled]; [Enabled].
PXE Boot Wait Time
Use this item to set wait time to press [ESC] key to abort the PXE boot.
Use either [+] / [-] or numeric keys to set the value.
PXE Boot Wait Time Set the default value to:[5]
Media Detect Count
Use this item to set number of times presence of media will be checked.
Use either [+] / [-] or numeric keys to set the value.
Media Detect Count Set the default value to:[5]

- **NVMe Configuration**

Press [Enter] to view current NVMe Configuration.
**Note: options only when NVME device is available.*

- **Wake-up Function Settings**

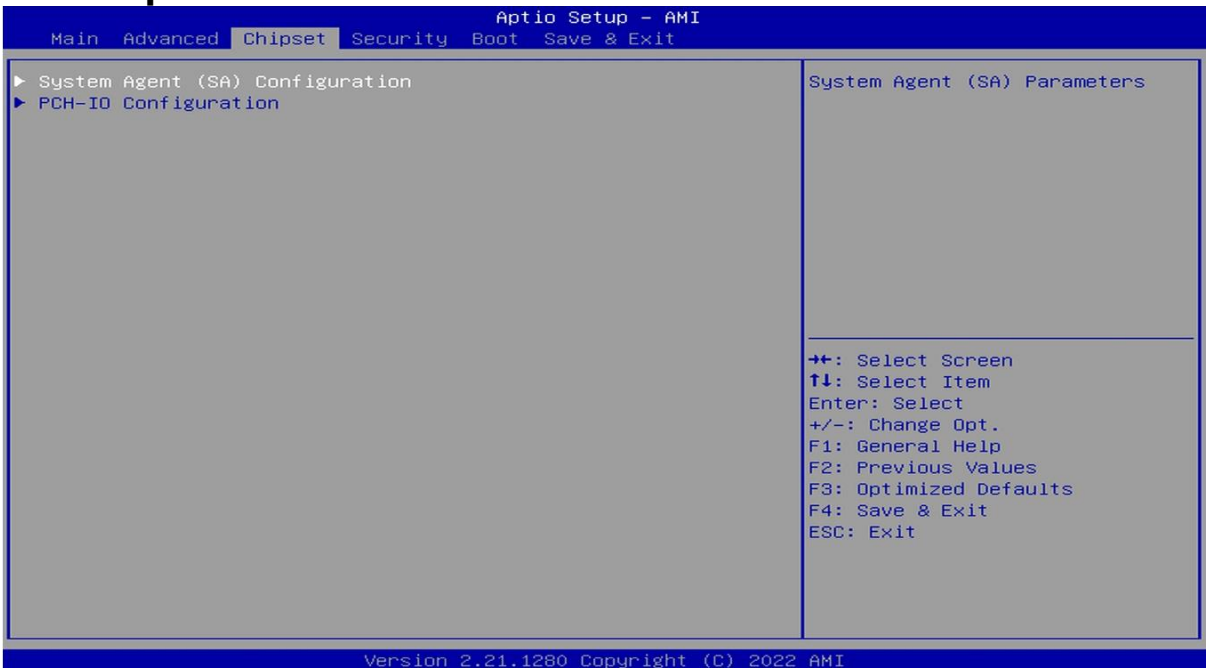
Press [Enter] to make settings for the following sub-items:
Wake-up System With Fixed Time
Use this item to enable or disable System wake on alarm event.
Wake-up System With Fixed Time Set the default value to: [Disabled]
The optional settings: [Disabled]; [Enabled].
When set as **[Enabled]**, the following 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.
When **Wake-up System With Fixed Time** set as **[Disabled]**, the following items shall appear:

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).
Wake-up System with Dynamic Time Set the default value to: [Disabled]
The optional settings: [Disabled]; [Enabled].
When set as **[Enabled]**, the following items shall appear:
Wake-up Time Increase
Use this item to select 1-60 minute(s).
USB Power Gating S4-S5
Use this item to enable or disable USB wake-up from S3/S4 state.
USB Power Gating S4-S5 Set the default value to: [Enabled].
The optional settings: [Disabled]; [Enabled].
**Note: This function is supported when 'ERP Support' is set as [Disabled].*
PCIE Wake-up from S3-S5
Enable or Disable PCIE Wake-up Support.
PCIE Wake-up from S3-S5 Set the default value to: [Disabled]
The optional settings: [Disabled]; [Enabled].

- **PTT Configuration**

Press [Enter] to make settings for the following sub-items:
TPM Device Selection
Use this item to selects TPM device.
TPM Device Selection Set the default value to: [dTPM]
The optional settings: [dTPM]; [PTT].
[PTT]: Enables PTT in SkuMgr;
[dTPM]: Disable 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.

  GTT Size Set the default value to: [8MB].

  The optional settings: [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.

  DVMT Pre-Allocated Set the default value to: [60M]

  The optional settings: [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 Graphic Memory size used by the Internal Graphics Device.

DVMT Total Gfx Mem Set the default value to: [256M]

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

Active LFP

Use this item to select the active LFP configuration.

Active LFP Set the default value to: [eDP].

The optional settings: [LVDS]; [eDP].

****NOTE***: When set as [LVDS], user can make further settings in following 'LVDS Panel Type'

LVDS Panel Type

LVDS Panel Type Set the default value to: [1024x768 1ch 24-bit]

The optional settings: [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

Backlight Control Set the default value to: [PWM Normal]

Use this item to control Back light setting.

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

Memory Data Rate

Total Memory

VT-d

VT-d

VT-d capability

VT-d Set the default value to: [Enabled].

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

► **PCH-IO Configuration**

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

PCH-IO Configuration

▸ **PCI Express Configuration**

Peer Memory Write Enable

Use this item to enable or disable peer memory write.

Peer Memory Write Enable Set the default value to: [Enabled].

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

▸ **SATA Configuration**

SATA Controller

Use this item to enable or disable SATA device.

SATA Controller Set the default value to: [Enabled].

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

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

SATA Mode Selection

This item determines how SATA controller(s) operate.

The optional settings: [AHCI].

SATA Port

SATA Port

SATA Port Set the default value to: [Enabled].

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

Hot Plug

Use this item to designates this port as Hot Pluggable

Hot Plug Set the default value to: [Disabled]

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

M.2

M.2

M.2 Set the default value to: [Enabled].

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

HD-Audio Support

HD-Audio Support Set the default value to: [Enabled]

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

SCS eMMC Support

SCS eMMC Support Set the default value to: [Disabled]

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

System State after Power Failure

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

System State after Power Failure Set the default value to: [Always Off]

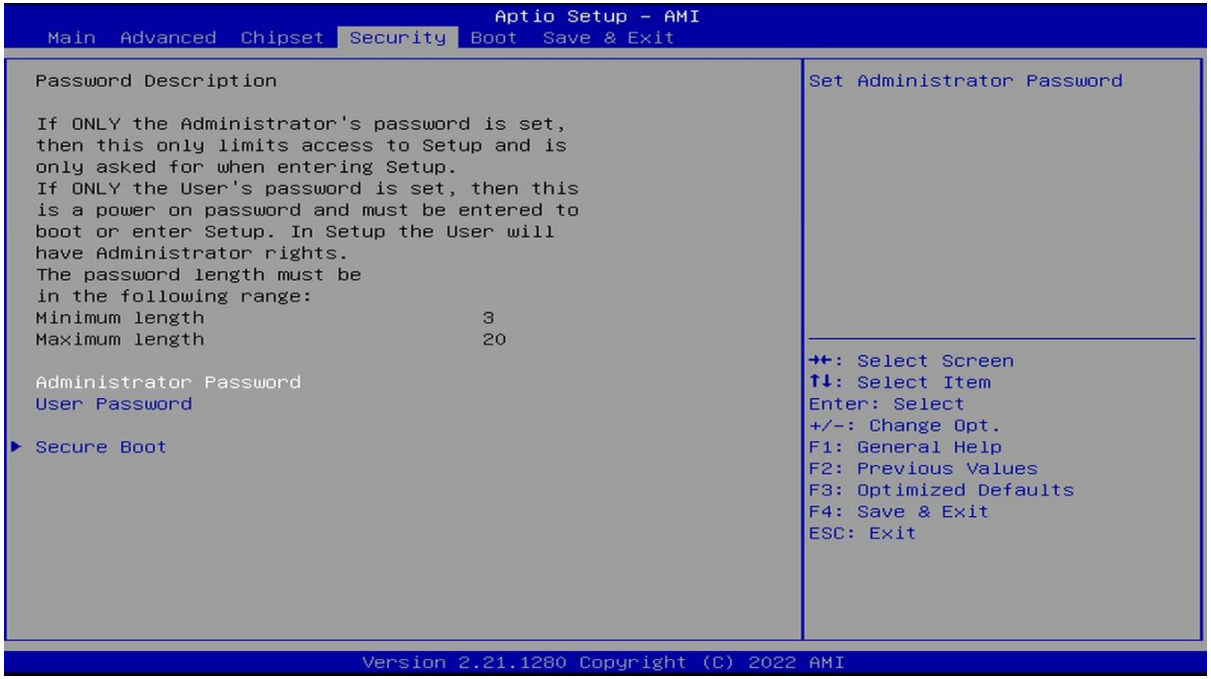
The optional settings: [Always On]; [Always Off]; [Former State].

PinCntrl Driver GPIO Scheme

PinCntrl Driver GPIO Scheme Set the default value to: [Enabled].

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

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 user 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 user

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: [Disabled]; [Enabled].

  Secure Boot Mode

  Set UEFI 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**

  Use this item to force system to User Mode, to install factory default Secure Boot key databases.

  - **Reset To Setup Mode**

  Use this item to delete all Secure Boot key databases from NVRAM.

  - **Key Management**

  This item enables expert users to modify Secure Boot Policy variables without full authentication, which includes the following items:

  Vendor Keys

Factory Key Provision

This item is for user to install factory default Secure Boot keys after the platform reset and while the System is in Setup mode.

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

- **Restore Factory Keys**

Use this item to force system into User Mode. Install factory default Secure Boot key databases.

- **Reset To Setup Mode**

Use this item to delete all Secure Boot key databases from NVRAM.

- **Export Secure Boot variables**

Use this item to copy NVRAM content of Secure Boot variables to files in a root folder on a file system device.

- **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 defaults**

Use this item to restore DB variable to factory defaults.

Secure Boot variable/Size/Keys/Key Source

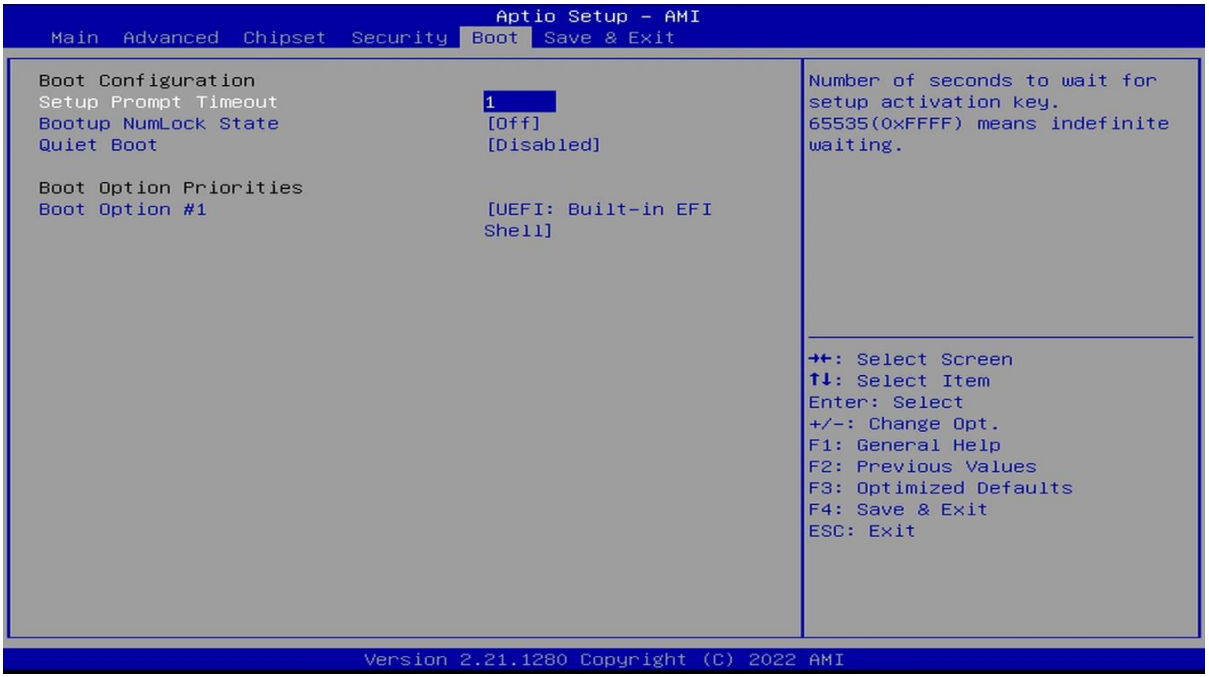
- **Platform Key(PK)/Key Exchange Keys/Authorized Signatures/Forbidden Signatures/ Authorized TimeStamps/OsRecovery Signatures**

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.

Setup Prompt Timeout Set the default value to:[1]

Bootup NumLock State
Use this item to select keyboard NumLock state.
Bootup NumLock State Set the default value to: [Off].
The optional settings: [On]; [Off].
Quiet Boot
Use this item to enables or disable Quiet Boot option.
Quiet Boot State Set the default value to: [Disabled]
The optional settings: [Disabled]; [Enabled].
Boot Option Priorities
Use this item to set the system boot order.
Boot Option #1
The optional settings: [UEFI: Built-in EFI Shell]; [Disabled].

3-11 Save & Exit Menu

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.

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 the user defaults to all the setup options.

Boot Override
UEFI: Built-in EFI Shell