

MF94V Series

User's Manual

NO.: G03-MF94V-F

Revision: 3.0

Release date: 2022-12-02

Trademark:

- * Specifications and Information contained in this documentation are furnished for information use only, and are subject to change at any time without notice, and should not be construed as a commitment by manufacturer.**

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 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. 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

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Manual Revision Information

Reversion
3.0

Revision History
Third Edition

Date
December 02, 2022

Item Checklist

- Motherboard
- Cable(s)

Chapter 1

Introduction of the Motherboard

1-1 Feature of Motherboard

- Onboard Intel® Apollo Lake series processor, with low power consumption never denies high performance
- Support 1* DDR3L 1866MHz SO-DIMM, maximum capacity up to 8GB
- Onboard 2* i225V 2.5GbE RJ-45 LAN ports
- Support 1* HDMI, 1* eDP, 1* LVDS
- Onboard 1* M.2 M-key slot, type-2242 SATA interface
- Onboard 1* M.2 B-key slot, type-3042, support 3G/4G card
- Onboard 1* Mini-PCIe slot, USB 2.0 and PCIe x1 interface
- Support 1* SATAIII device
- Support 3* USB 3.1(Gen.1) + 3* USB 2.0
- Support 2* COM Ports (***COM1** supports RS232/422/485; **COM2** supports RS232)
- Support CPU Smart FAN
- Compliance with ErP standard
- Support Watchdog function
- Solution for Industrial PCs / Factory Automation / IoT Solution

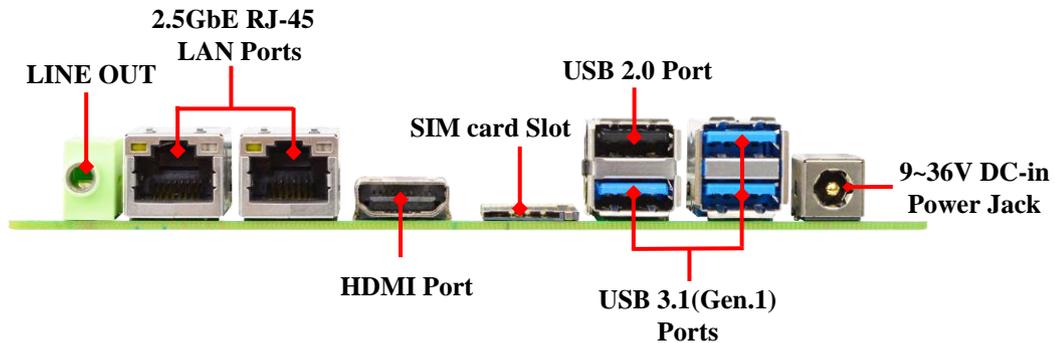
1-2 Specification

Spec	Description
Design	<ul style="list-style-type: none"> ● 3.5”SBC; 8-Layers; PCB size: 14.8x 10.2 cm
Embedded CPU	<ul style="list-style-type: none"> ● Integrated with Intel® Apollo Lake series CPU <p><i>* Note: CPU model varies from different IPC options. Please consult your dealer for more information of onboard CPU.TDP varies depending on CPU.</i></p>
Memory Slot	<ul style="list-style-type: none"> ● 1* DDR3L SO-DIMM slot support 1* DDR3L 1866MHz non-ECC SO-DIMM up to 8GB <p><i>* Note: Memory clock supporting range is decided by specific CPU of the model. For more memory compatibility information please consults your local dealer.</i></p>
Expansion Slot	<ul style="list-style-type: none"> ● 1* Full-size Mini-PCIE slot supports USB 2.0/PClex1 interface (MPE) ● 1* M.2 B-key 3042 slot supports USB 3.0/ PClex1interface (M2B) ● 1* SIM card slot functions with M.2 B-key, 3042 slot (SIMCARD)
Storage	<ul style="list-style-type: none"> ● 1* M.2 M-key 2242 slot supports SATA interface (M2M) ● 1* SATAIII 6Gb/s port
LAN Chip	<ul style="list-style-type: none"> ● Integrated with 2* Intel i225V 2.5GbE LAN chip ● Support Fast Ethernet LAN function of providing 10/100/1000/2500Mbps Ethernet data transfer rate <p><i>*Note: 2500Mbps high-speed transmission rate is only supported over CAT 5e UTP cable</i></p>
Audio Chip	<ul style="list-style-type: none"> ● Realtek ALC888S-GR HD audio chip
BIOS	<ul style="list-style-type: none"> ● AMI Flash ROM
Rear I/O	<ul style="list-style-type: none"> ● 1* 9~36V DC-in power Jack ● 1* HDMI port ● 3* USB 3.1(Gen.1) ports ● 1* USB 2.0 port ● 1* SIM card slot (function with M.2 B-key, 3042 slot) ● 2* 2.5GbE RJ-45 LAN ports ● 1* Audio Line Out port
Internal I/O	<ul style="list-style-type: none"> ● 1* 2-pin internal 9~36V DC-in power connector ● 1* SATA Power-out connector

	<ul style="list-style-type: none"> ● 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 headers (COM1 supports RS232/422/485; COM2 supports RS232) ● 1* Front panel audio header ● 1* GPIO header ● 1* eDP header ● 1* LVDS header ● 1* LVDS inverter header ● 1* I2C_CON header ● 1* SMBUS header
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1-3 Layout Diagram

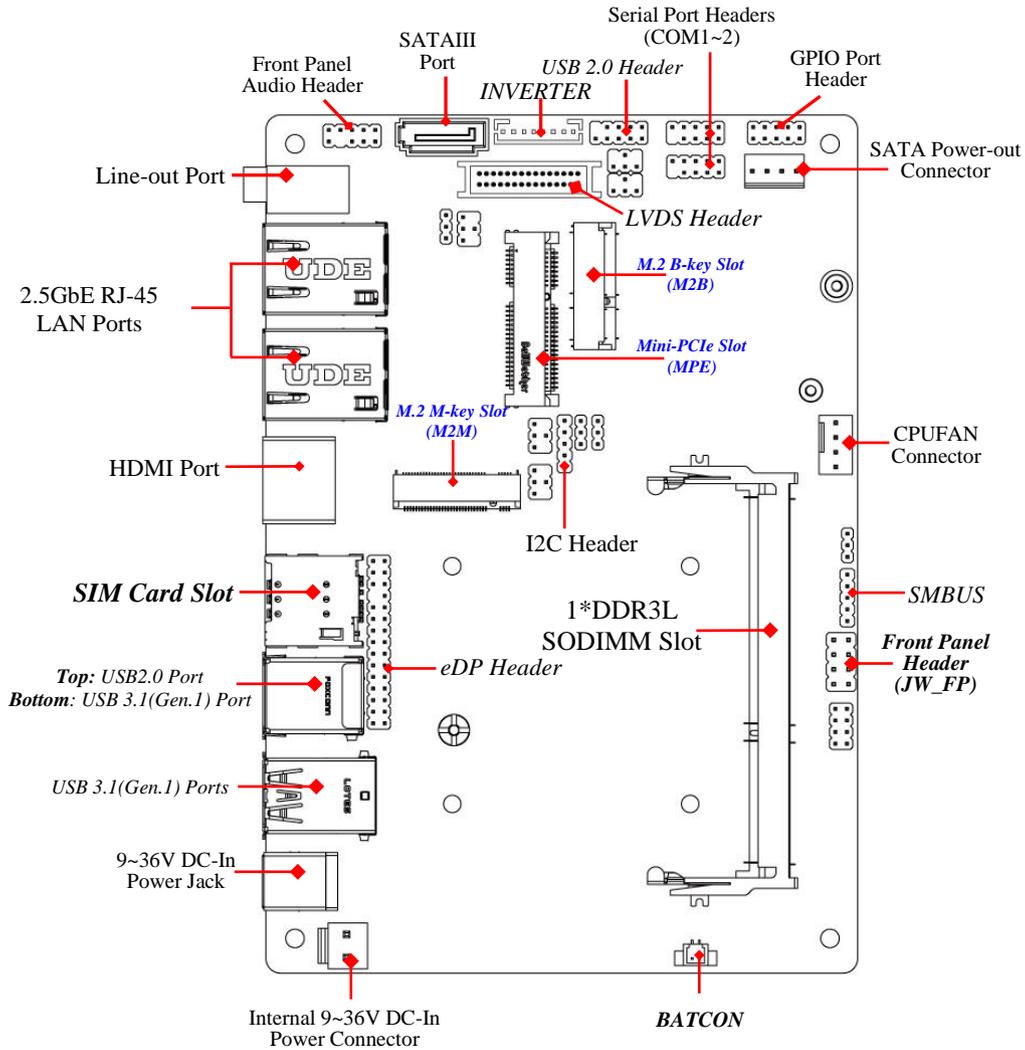
Rear IO Diagram:



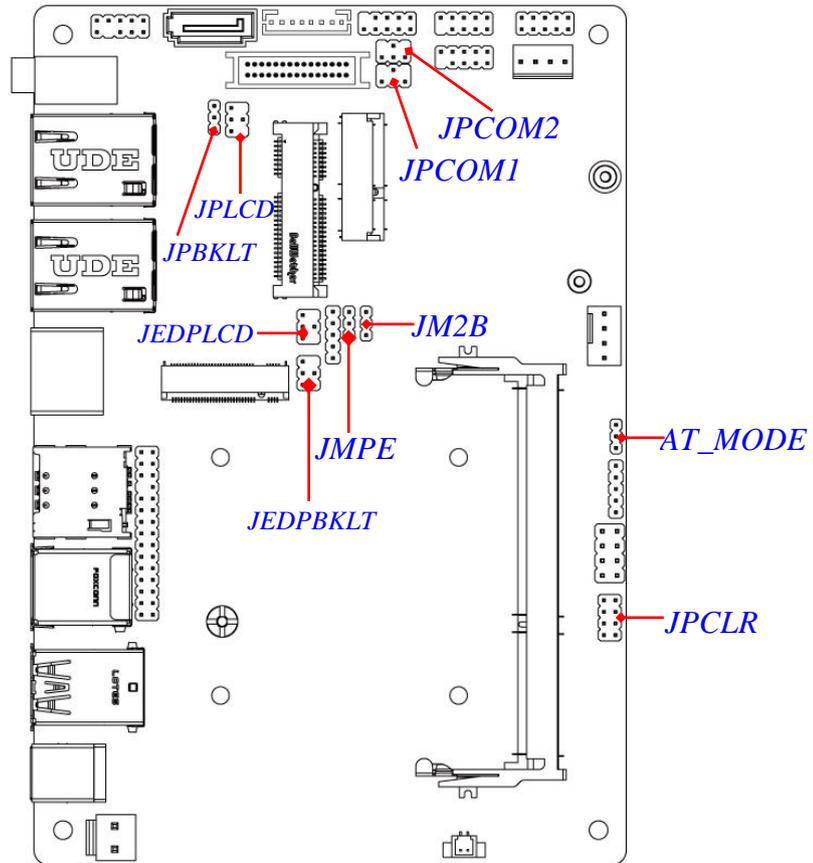
Warning!!

The board has a 9~36V DC-in power connector (**DCIN1**) in I/O back panel and an internal 9~36V power connector (**DCIN**). User can only connect one type of compatible power supply to one of them to power the system.

Diagram-Front Side:



Jumper Positions:



Jumpers

Jumper	Name	Description	Pitch
JPCOM1	COM1 Header Pin-9 Function Select	4-Pin Block	2.0mm
JPCOM2	COM2 Header Pin-9 Function Select	4-Pin Block	2.0mm
JPLCD	LCD Panel VCC Select	4-Pin Block	2.0mm
JPBKLT	LCD BACKLIGHT VCC Select	3-Pin Block	2.0mm
JEDPLCD	eDP LCD Panel VCC Select	4-Pin Block	2.0mm
JEDPBKLT	eDP LCD BACKLIGHT VCC Select	4-Pin Block	2.0mm
JM2B	M.2 B-key Power Select	3-Pin Block	2.0mm
JMPE	Mini-PCIe Power Select	3-Pin Block	2.0mm
JPCLR	PIN(1-2) = Clear ME_RTC PIN (3-4) = Clear CMOS PIN (5-6) = ME Disable PIN (7-8) = CASE OPEN	8-Pin Block	2.0mm
AT_MODE	ATX Mode/AT Mode Select	3-Pin Block	2.0mm

Connectors

Connector	Name
DCIN1	9~36V DC-in Power Jack
USB1	Top: USB 2.0 Port Connector Bottom: USB 3.1(Gen.1) Port Connector
USB2	USB 3.1(Gen.1) Port Connector X2
SIMCARD	SIM card slot
HDMI	HDMI Port Connector
LAN1/LAN2	2.5GbE RJ-45 LAN Port Connector X2
LINE_OUT	Audio Line Out Connector

DCIN	Internal 2-Pin 9~36V DC-in Power Connector
SATA	SATAIII Port Connector
SATAPWR	SATA Power out Connector
CPUFAN	CPUFAN Connector

Headers

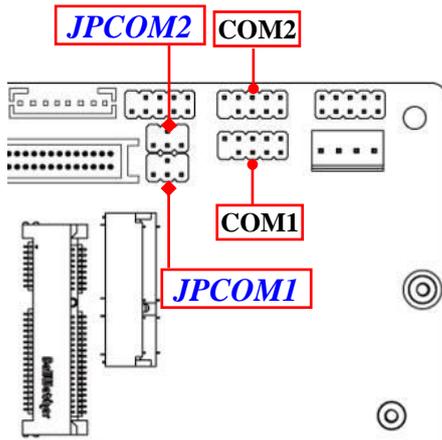
Header	Name	Description	Pitch
JW_FP	Front Panel Header (PWR LED/ HDD LED/Power Button /Reset)	8-pin Block	2.54mm
FP_USB1	USB 2.0 Header	9-pin Block	2.0mm
FP_AUDIO	Front Panel Audio Header	9-pin Block	2.0mm
GPIO_CON	GPIO Port Header	10-pin Block	2.0mm
COM1~COM2	Serial Port Header	9-pin Block	2.0mm
eDP	eDP Port Header	29-pin Block	2.0mm
LVDS	LVDS Port Header	30-pin Block	1.25mm
INVERTER	LVDS Inverter	8-pin Block	2.0mm
I2C	I2C Header	5-pin Block	2.0mm
SMBUS	SMBUS Header	5-pin Block	2.0mm

Chapter 2

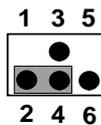
Hardware Installation

2-1 Jumper Settings

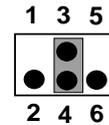
JPCOM1/JPCOM2 (4-pin): COM1/COM2 Header Pin-9 Function Select (2.0 pitch)



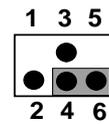
JPCOM1 → COM1 Header Pin-9 VCC
JPCOM2 → COM2 Header Pin-9 VCC



2-4 Closed:
RI=RING

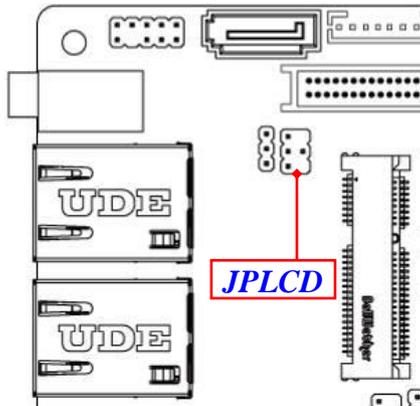


3-4 Closed:
RI= +5V

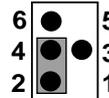


4-6 Closed:
RI= +12V

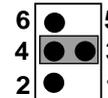
JPLCD (4-pin): LCD Panel VCC Select (2.0 pitch)



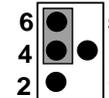
JPLCD → LCD Panel VCC Select



2-4 Closed:
VCC= +3.3V

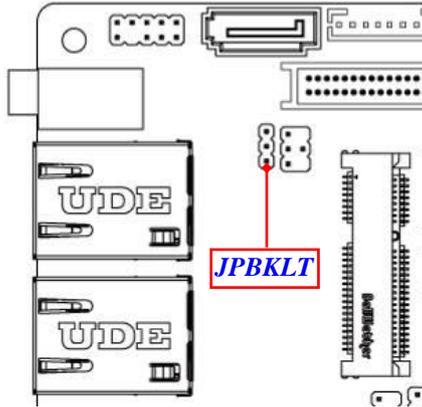


3-4 Closed:
VCC= +5V



4-6 Closed:
VCC= +12V

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



JPBKLT → LCD BACKLIGHT VCC Select

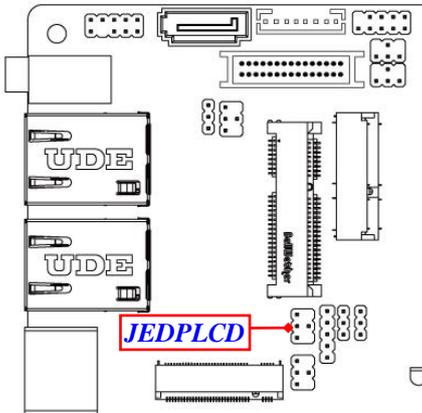


**1-2 Closed:
VCC= +5V**

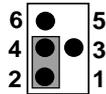


**2-3 Closed:
VCC= +12V**

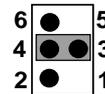
JEDPLCD (4-pin): eDP LCD Panel VCC Select (2.0 pitch)



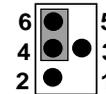
JEDPLCD → eDP LCD Panel VCC Select



**2-4 Closed:
VCC= +3.3V**

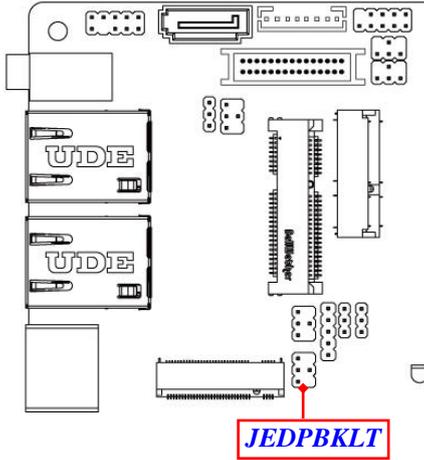


**3-4 Closed:
VCC= +5V**

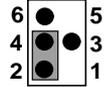


**4-6 Closed:
VCC= +12V**

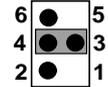
JEDPBKLT (4-pin): eDP LCD BACKLIGHT VCC Select (2.0 pitch)



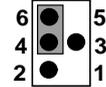
JEDPBKLT → eDP BACKLIGHT Panel VCC Select



2-4 Closed:
VCC= +5V

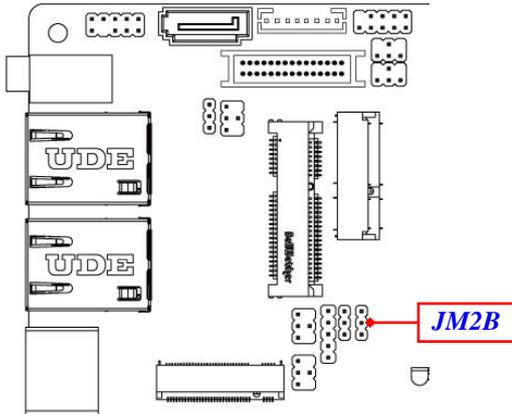


3-4 Closed:
VCC= +12V

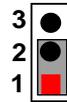


4-6 Closed:
VCC= ADP12V

JM2B (3-pin): M.2 B-key Power Select (2.0 pitch)



JM2B → M.2 B-key Power Select

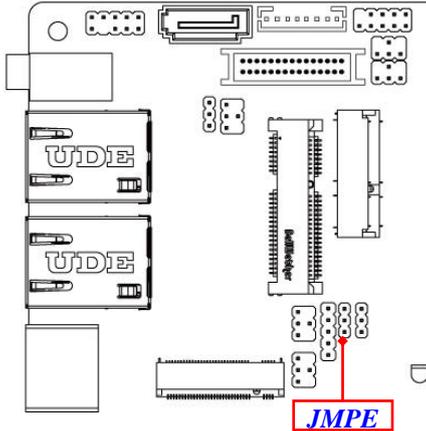


1-2 Closed:
VCC= VCC3



2-3 Closed:
VCC= 3VSB

JMPE (3-pin): Mini-PCle Power Select (2.0 pitch)



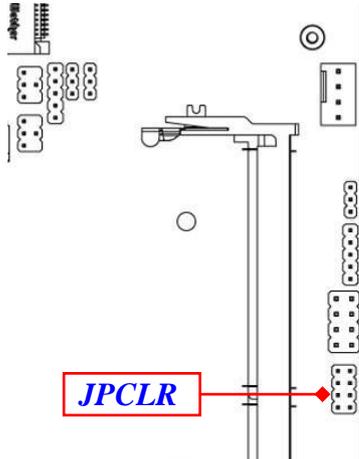
JMPE → Mini-PCle Power Select



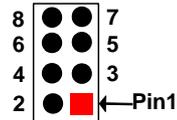
1-2 Closed:
VCC= VCC3

2-3 Closed:
VCC= 3VSB

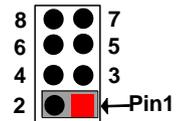
PIN(1-2) of JPCLR (8-pin): Clear ME_RTC (2.0 pitch)



PIN(1-2) Clear ME_RTC

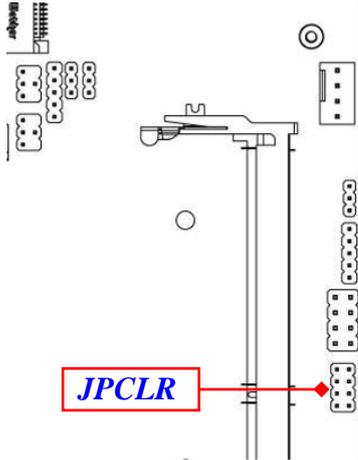


1-2 Open: Normal(Default)

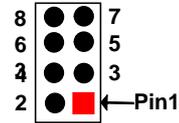


1-2 Closed: Clear ME_RTC

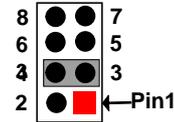
PIN(3-4) of JPCLR (8-pin): Clear CMOS (2.0 pitch)



PIN(3-4) Clear CMOS

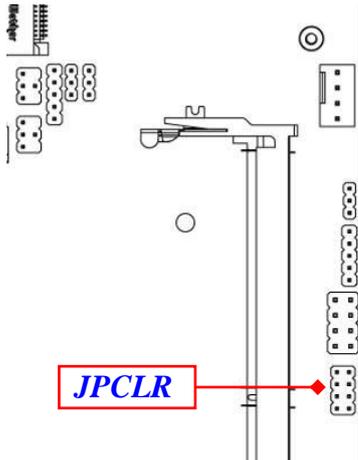


3-4 Open: Normal(Default)

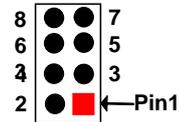


3-4 Closed: Clear CMOS

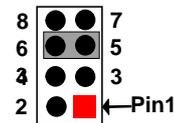
PIN(5-6) of JPCLR (8-pin): ME Disable (2.0 pitch)



PIN(5-6) ME Disable

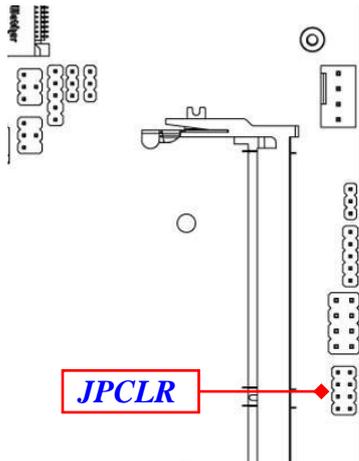


5-6 Open: Normal(Default)

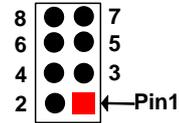


5-6 Closed: ME Disable

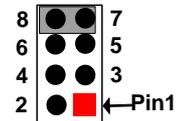
PIN(7-8) of JPCLR (8-pin): CASE OPEN (2.0 pitch)



PIN(7-8) CASE OPEN



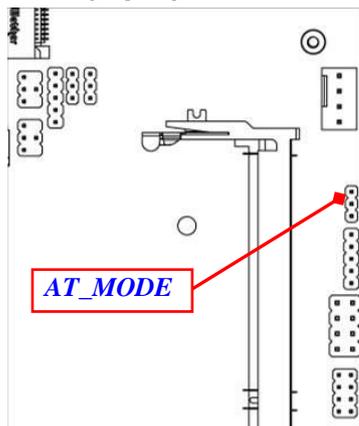
7-8 Open: Normal(Default)



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 when 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 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 Connectors and Headers

2-2-1 Connectors

(1) Rear I/O Connectors

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

Icon	Name	Function
	9~36V DC-in Power Jack	For user to connect compatible power adapter to provide power supply for the system.
	USB 3.1(Gen.1) Port	To connect USB keyboard, mouse or other devices compatible with USB 3.1(Gen.1) 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 RJ-45 LAN jack for Network connection which supports 10/100/1000/2500 Mbps Ethernet data transfer rate (*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.

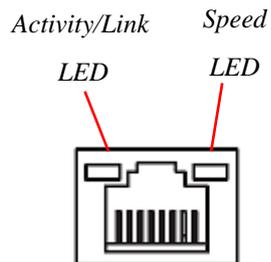
***Note:** SIM card is supported when **M2B (M.2 B-Key 3042)** slot is installed with 3G/4G/LTE card.

(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:

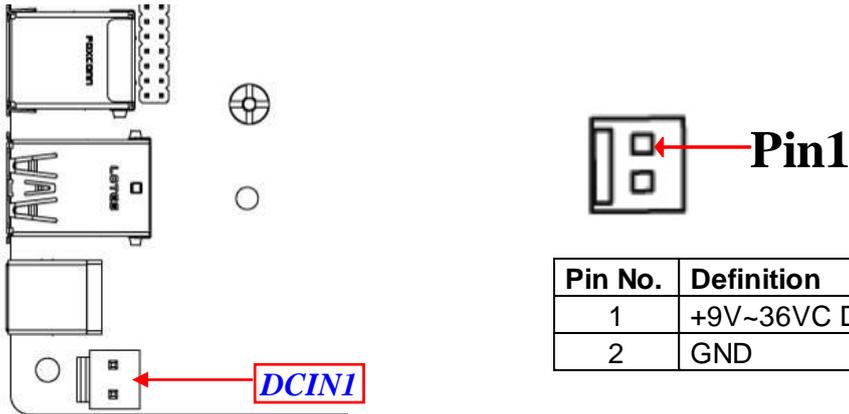


Activity/Link LED	
Status	Description
Off	No Link
Blinking	Data Activity
On	Link

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 9~36V DC-in Power Connector

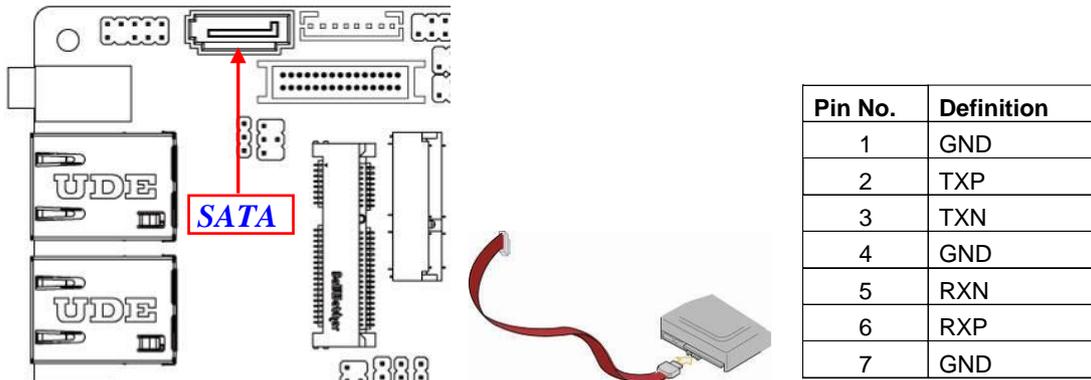


Pin No.	Definition
1	+9V~36VC DC-In
2	GND

Warning: Find Pin-1 position before connecting power cable to this 2-pin power connector. **WRONG INSTALLATION DIRECTION WILL DAMAGE THE BOARD!!**

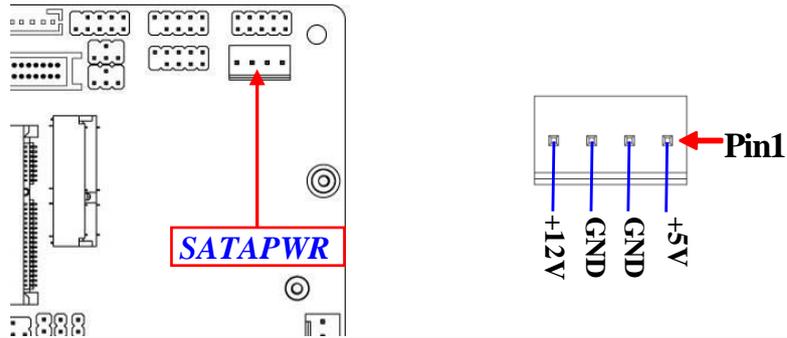
(4) SATA (7-pin): SATAIII Port Connector

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



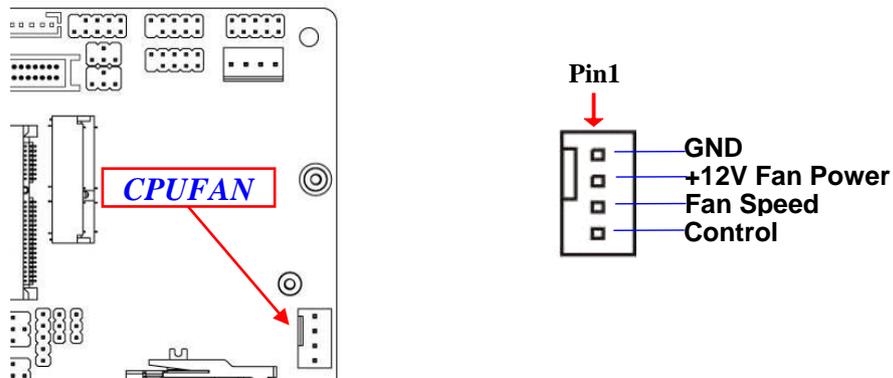
Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

(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 driver!

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

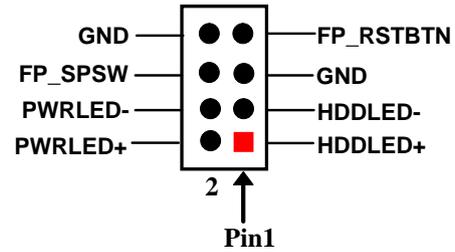
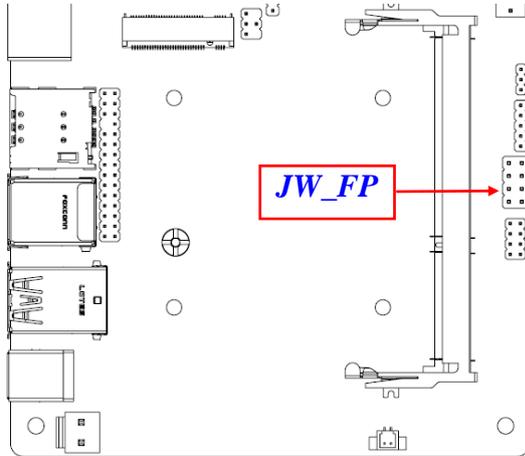


(7) BATCON (2-pin): Battery Connector

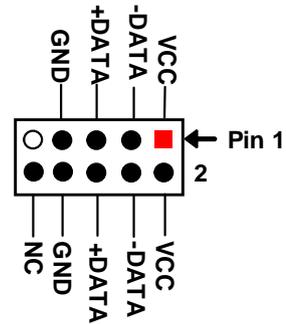
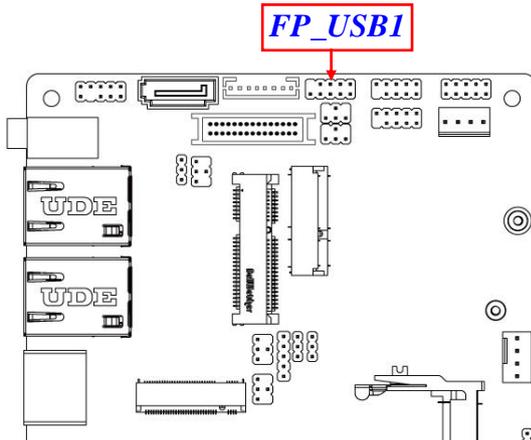


2-2-2 Headers

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

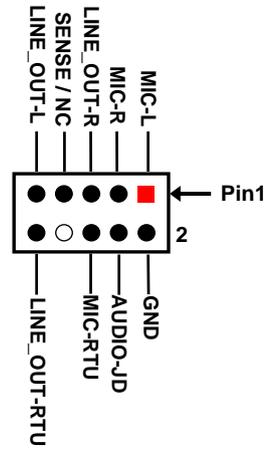
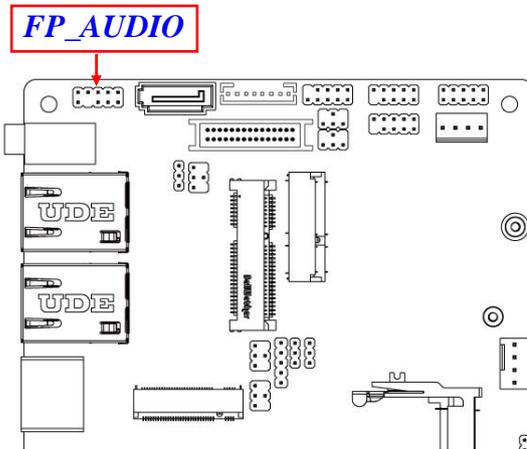


FP_USB1 (9-pin): USB 2.0 Port Header (2.0 pitch)

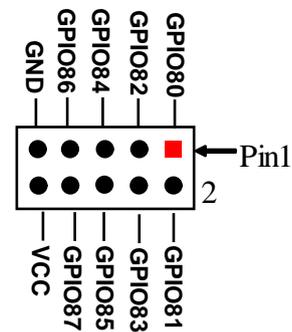
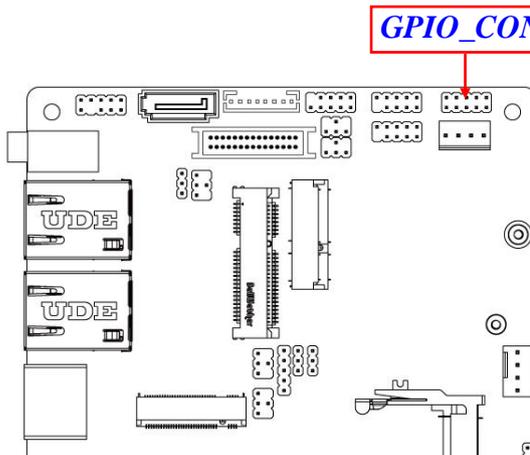


FP_AUDIO (9-pin): Front Panel Header (2.0 pitch)

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

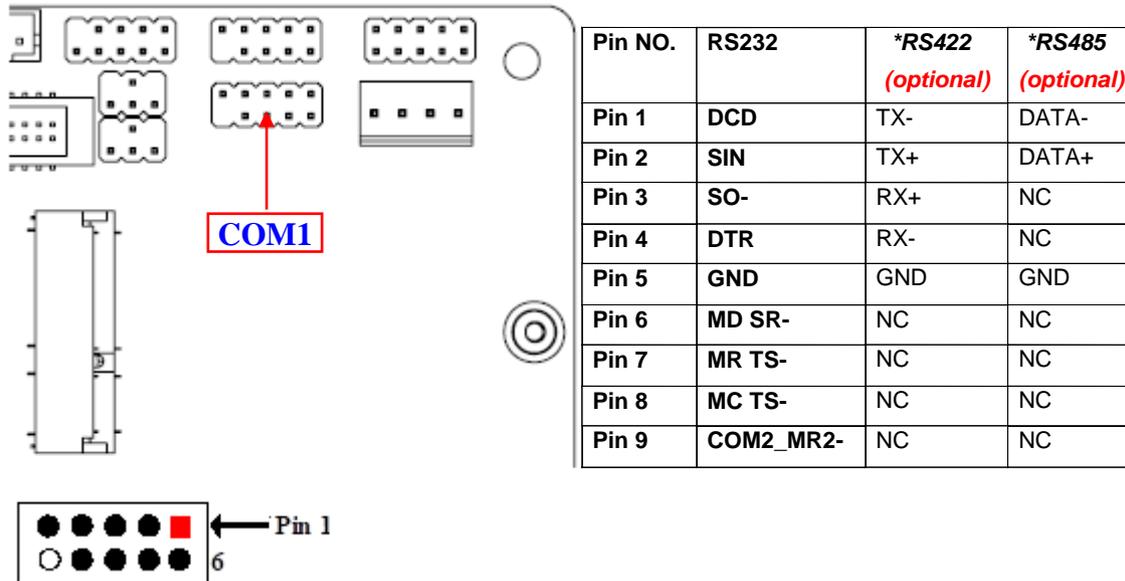


GPIO_CON (10-pin): GPIO Port Header (2.0 pitch)



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

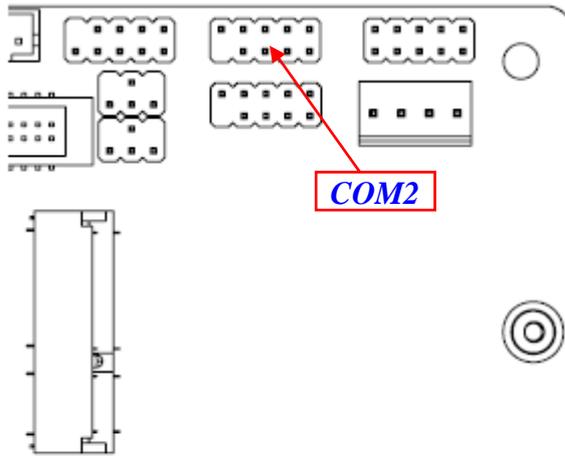
COM1: RS232/422/485 Serial Port Header.



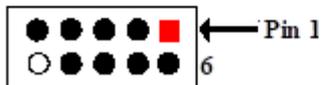
***Note:** COM1 header can function as RS232/422/485 port header. In normal settings COM1 functions as RS232 header. With compatible COM cable COM1 can function as RS422 or RS485 header. User also needs to go to BIOS to set '**Transmission Mode Select**' for COM1 at first, before using specialized cable to connect different pins of this port.

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

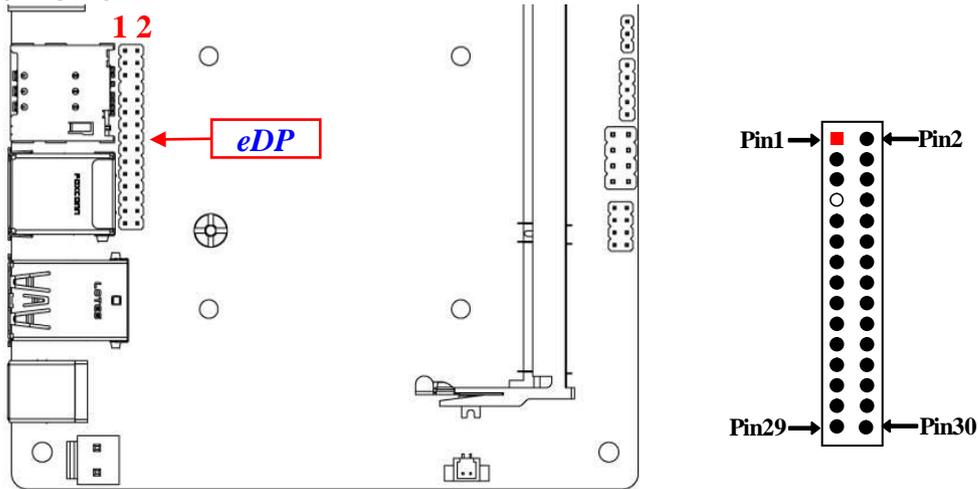
COM2: RS232 Serial Port Header.



Pin NO.	RS232
Pin 1	DCD
Pin 2	SIN
Pin 3	SO-
Pin 4	DTR
Pin 5	GND
Pin 6	MD SR-
Pin 7	MR TS-
Pin 8	MC TS-
Pin 9	COM2_MR2-

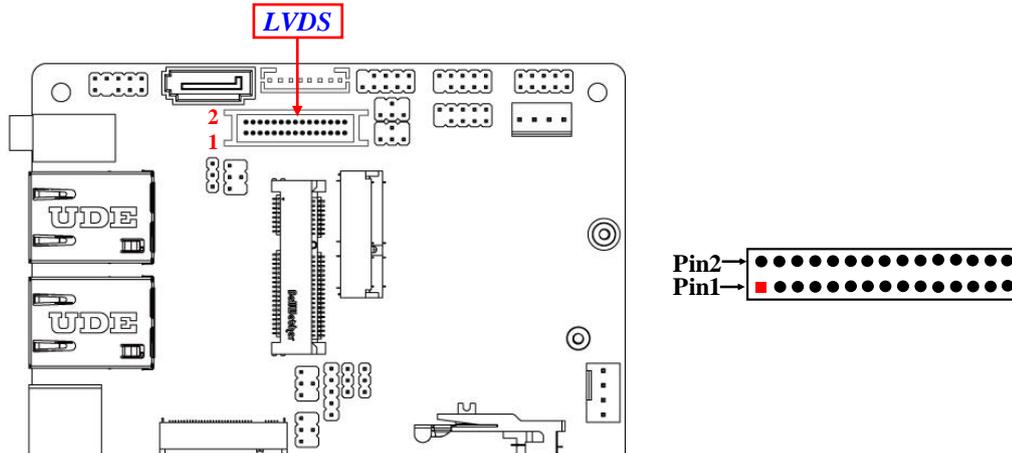


eDP (29-pin): eDP Port Header (2.0 pitch)



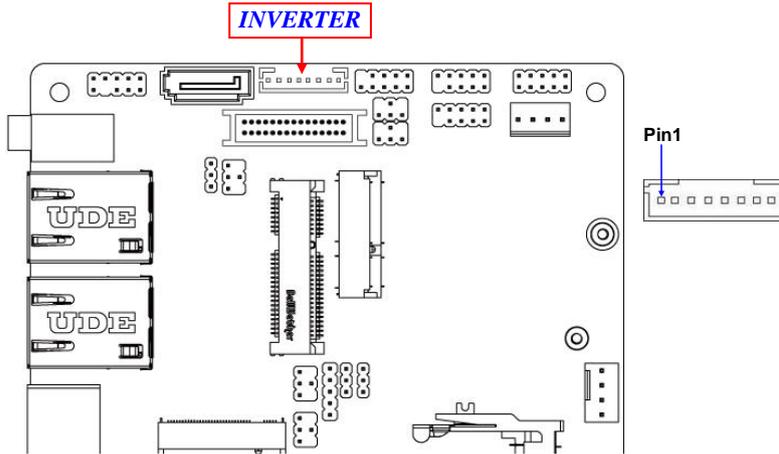
Pin Define	Pin No.	Pin No.	Pin Define
BKLT_PW	Pin 1	Pin 2	BKLT_PW
BKLT_PW	Pin 3	Pin 4	GND
GND	Pin 5	Pin 6	GND
N/A	Pin 7	Pin 8	NC
EDP_VDD	Pin 9	Pin 10	NC
EDP_VDD	Pin 11	Pin 12	L_BKLT_PWM
GND	Pin 13	Pin 14	GND
L_BKLT_EN	Pin 15	Pin 16	EDP_AUXP_C
EDP_HPD	Pin 17	Pin 18	EDP_AUXN_C
GND	Pin 19	Pin 20	GND
EDP_LANE+3	Pin 21	Pin 22	EDP_LANE-3
EDP_LANE+2	Pin 23	Pin 24	EDP_LANE-2
GND	Pin 25	Pin 26	GND
EDP_LANE+1	Pin 27	Pin 28	EDP_LANE-1
EDP_LANE+0	Pin 29	Pin 30	EDP_LANE-0

LVDS (30-pin): 24-bit Dual Channel LVDS 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	Pin 14	Pin 13	GND
NC/DDC_CLK	Pin 12	Pin 11	NC/DDC_DATA
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

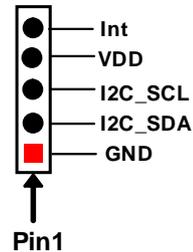
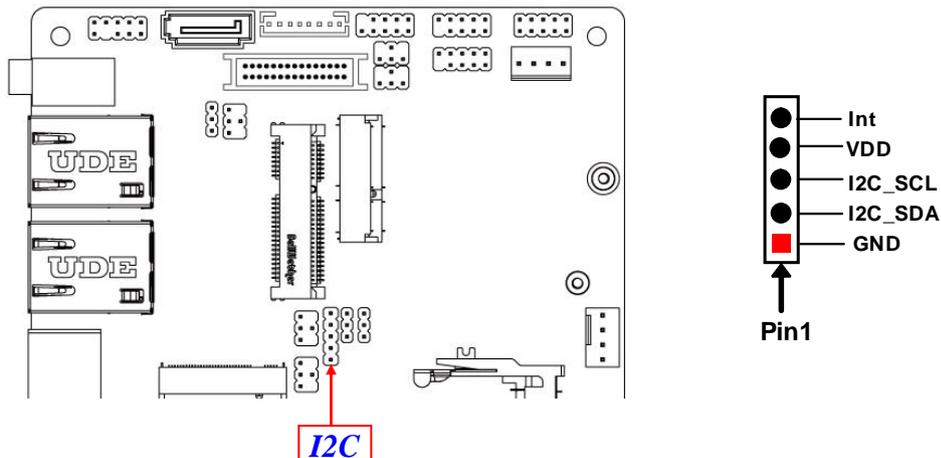
INVERTER (8-pin): LVDS Inverter (2.0 pitch)



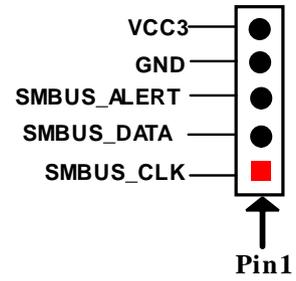
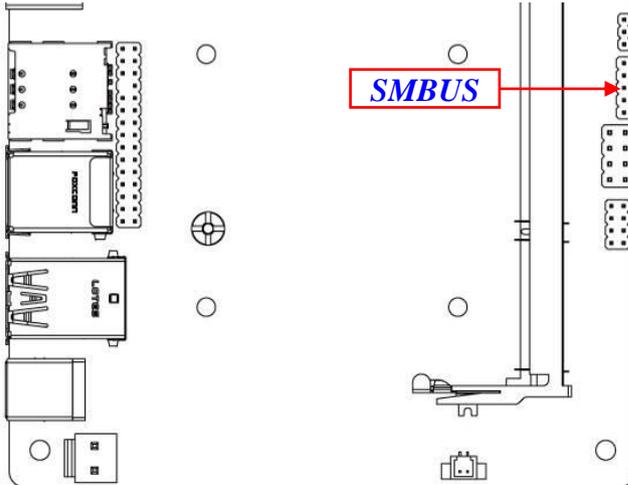
Pin No.	Definition
1	Backlight Enable
2	Backlight PWM
3	PVCC
4	PVCC
5	GND
6	GND
7	Backlight Up SW
8	Backlight Down SW

Warning! Find Pin-1 location of the inverter and make sure that the installation direction is correct! Otherwise serious harm will occur to the board/display panel!!

I2C (5-pin): I2C Header (2.0 pitch)



SMBUS (5-pin): SMBUS 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.

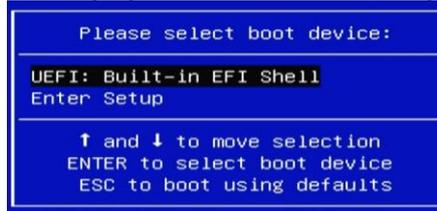
The BIOS is a program located on a Flash Memory on the motherboard. This program is a bridge between motherboard and operating system. When you start the computer, the BIOS program will gain control. The BIOS first operates an auto-diagnostic test called POST (power on self test) for all the necessary 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 immediately allows you to enter Setup.

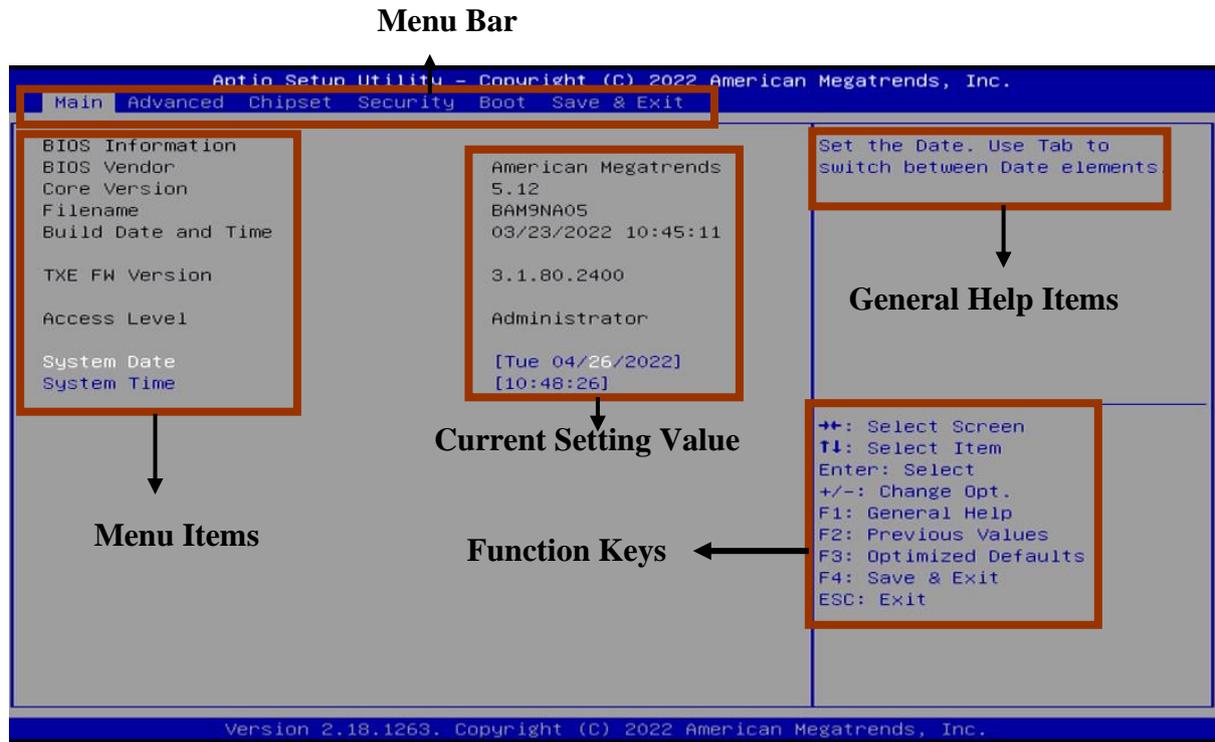
If the message disappears before your respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the “RESET” button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt> and <Delete> keys. If you do not press the keys at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

Press 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 value.
- [F3]: Optimized defaults.
- [F4]: Save & Exit.
- Press <Esc> to quit the 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

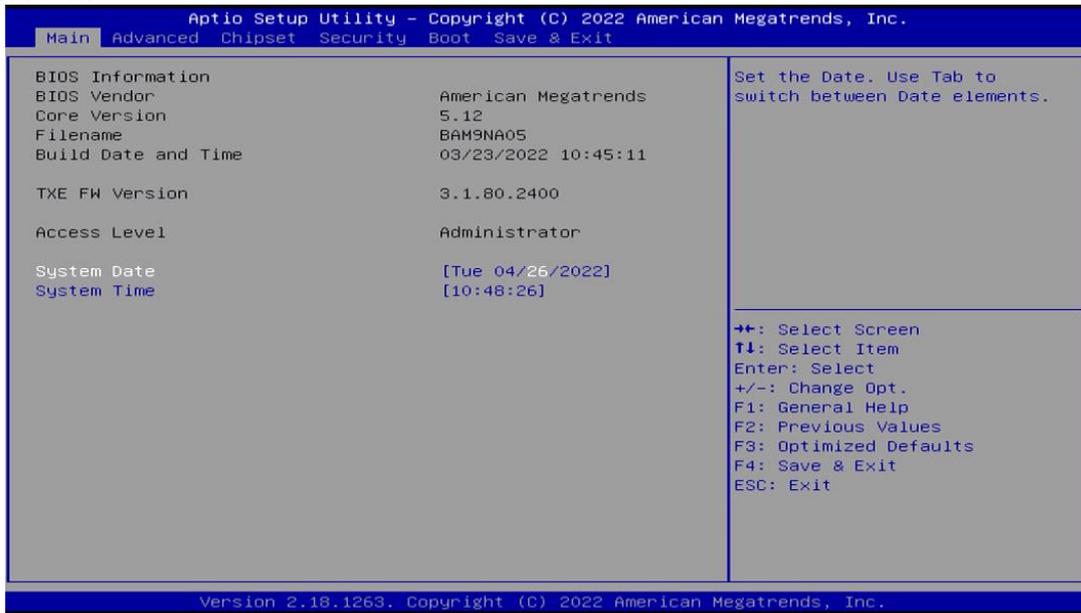
To change system basic configuration

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.



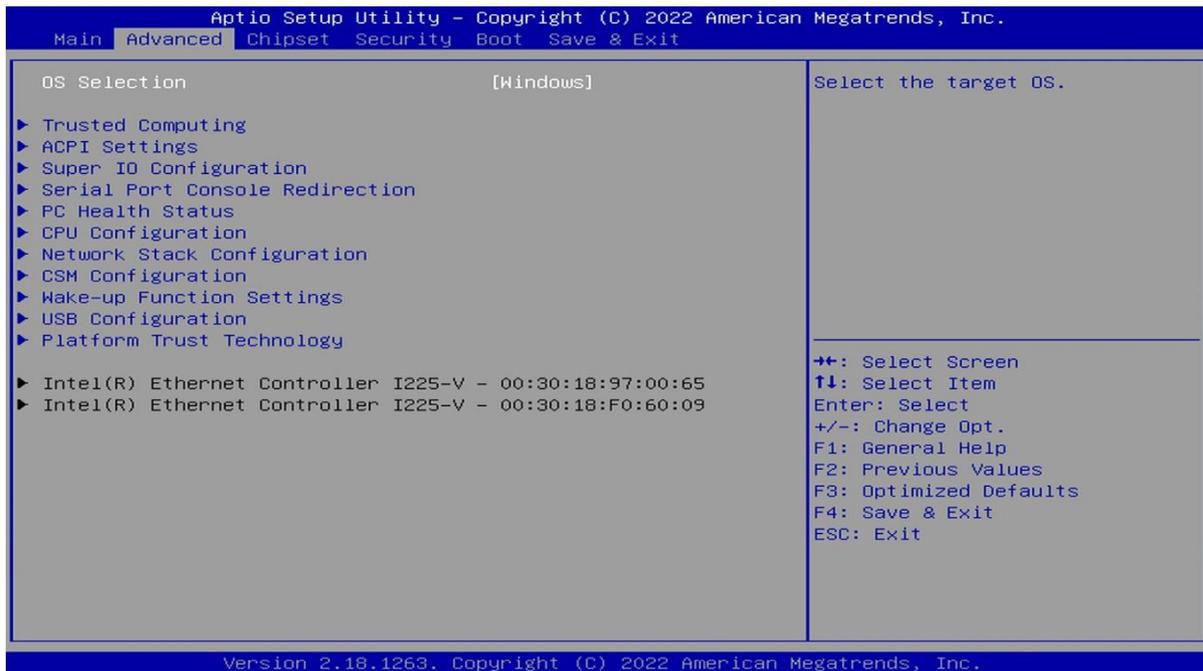
System Date

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



OS Selection

Use this item to select the target OS.

The optional settings are: [Windows]; [Intel Linux]; [MSDOS].

▶ Trusted Computing

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

Configuration

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].

No Security Device Found

▶ **ACPI Settings**

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

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**

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

Serial Port

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

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

Device Settings

Change Settings

Use this item to select an optimal settings for Super IO device. **Changing setting may conflict with system resources.**

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 are: [RS422]; [RS232]; [RS485].

Mode Speed Select

Use this item to select RS232/RS422/RS485 speed.

The optional settings are: [RS232/RS422/RS485=250Kbps]; [RS232=1Mbps, RS422/RS485=10Mbps].

► Serial Port 2 Configuration

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

Serial Port

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

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

Device Settings

Change Settings

Use this item to select optimal settings for Super IO device. **Changing setting may conflict with system resources.**

The optional settings are: [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.

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

Case Open Detect

Use this item to detect if case have ever been opened. Show message in POST.

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

When set as **[Enabled]**, system will detect if CASE OPEN has been short or not (refer to Page 13, **Jumper JPCLR for CASE OPEN Select**); if **Pin7-8 of JPCLR** is short, system will show Case Open Message during POST.

WatchDog Reset Timer

Use this item to support WDT reset function.

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

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

WatchDog Reset Timer Value

User can set a value in the range of [10] ~ [255] seconds, or [1] ~ [255] minutes.

WatchDog Reset Timer Unit

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

WatchDog Wake-up Timer

This item support WDT wake-up while ERP function is set as [Enabled].

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

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

WatchDog Wake-up Timer Value

The setting range is [10] ~ [4095] seconds, or [1] ~ [4095] minutes.

WatchDog Wake-up Timer Unit

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

ATX Power Emulate AT Power

This item displays current Emulate AT Power Status, motherboard power On/Off control by power supply. User needs to select 'AT or ATX Mode' on MB at first (refer to Page 13, ***Jumper AT_MODE block Pin 1-2 of ATX Mode & Pin 2-3 of AT Mode Select***).

▶ **Serial Port Console Redirection**

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

COM1

Console Redirection

Use this item to console redirection enable or disable

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

When set as [**Enabled**], users can make more setting for the following sub-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 items:

Terminal Type

[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.

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

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].

Legacy OS Redirection Resolution

On Legacy OS, the Number of Rows and Columns supported redirection.

The optional settings are: [80x24]; [80x25].

Putty KeyPad

Use this item to select FunctionKey and KeyPad on Putty.

The optional settings: [VT100]; [Intel Linux]; [XTERMR6]; [SCO]; [ESCN]; [VT400].

Redirect After BIOS POST

The optional settings are: [Always Enable]; [BootLoader].

When [**BootLoader**] is selected, then Legacy Console Redirection is disabled before booting to legacy OS. When [**Always Enabled**] is selected, then Legacy Console Redirection is enabled for legacy OS. Default setting for this option is set to [**Always Enabled**].

Serial Port for Out-of-Band Management/

Windows Emergency Management Services (EMS)

Console Redirection

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

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

▶ 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

The default setting is: [COM1].

Terminal Type

Use this item to 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

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

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]; [57600]; [115200].

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]; [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, set shutdown temperature, or make further settings in ‘**SmartFAN Configuration**’. Press [Enter] to make

settings for the following sub-items:

CPUFAN Smart Mode

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

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

CPUFAN Full-Speed Temperature

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

CPUFAN Full-Speed Duty

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

CPUFAN Idle-Speed Temperature

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

CPUFAN Idle-Speed Duty

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

▶ **CPU Configuration**

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

VT-d

Use this item to enable or disable CPU VT-d.

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

EIST

Use this item to enable or disable Intel SpeedStep.

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

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

Turbo Mode

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

C-States

Use this item to enable or disable C states.

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

When set as [Enabled], users can make more settings for the following sub-items:

Enhanced C-states

Use this item to enable or disable C1E. When enabled, CPU will switch to minimum speed when all cores enter C-State.

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

Max Package C State

This item controls the Max Package C state that the processor will support.

The optional settings are: [PC2]; [PC1]; [C0].

Max Core C State

This item controls the Max Core C state that cores will support.

The optional settings are: [Fused Value]; [Core C10]; [Core C9]; [Core C8]; [Core C7]; [Core C6]; [Core C1]; [Unlimited].

▶ **Network Stack Configuration**

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

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 optional will not be created.

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 optional will not be created.

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

PXE Boot Wait Time

Use this item to set wait time to press [ESC] key to abort the PXE boot.

Media Detect Count

Use this item to set media detect count.

▶ **CSM Configuration**

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

Compatibility Support Module Configuration

Boot Option Filter

This item controls Legacy/UEFI ROMs priority.

The optional settings are: [UEFI and Legacy]; [Legacy only]; [UEFI only].

Network

This item controls the execution of UEFI and legacy PXE OpROM.

The optional settings are: [Do not launch]; [UEFI]; [Legacy].

Storage

This item controls the execution of UEFI and Legacy Storage OpROM.

The optional settings are: [Do not Launch]; [UEFI]; [Legacy].

Video

This item controls the execution of UEFI and Legacy Video OpROM.

The optional settings are: [UEFI]; [Legacy].

Other PCI Devices

This item determines OpROM execution policy for devices other than Network, storage or video.

The optional settings are: [Do not launch]; [UEFI]; [Legacy].

▶ **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-up by RTC alarm.

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 displays and changes the system time from the Real-Time Clock. Clock is displayed in 24-hour format.

Wake-up Second

Use this item to displays and changes the system time from the Real-Time Clock. Clock is displayed in 24-hour format.

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 minutes.

The optional settings are: [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 Wake-up from S4

Use this item to enable or disable USB Wake-up by ERP function in S4.

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

**This item is only supported when 'ERP Support' is set as [Disabled]. Please disable ERP before activating this function in S4.*

▶ **USB Configuration**

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

USB Configuration

USB Devices

Legacy USB Support

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

[Enabled]: To enable legacy USB support.

[Disabled]: To keep USB devices available only for EFI applications.

[Auto]: To disable legacy support if no USB devices are connected.

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 Drive 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.

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

'Auto' uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor.

Select [Manual] you can set value for the following sub-item: '**Device Power-up Delay in Seconds**'.

Device Power-up Delay in Seconds

The delay range is from [1] to [40] seconds, in one second increments.

▶ **Platform Trust Technology**

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

TPM Configuration

fTPM

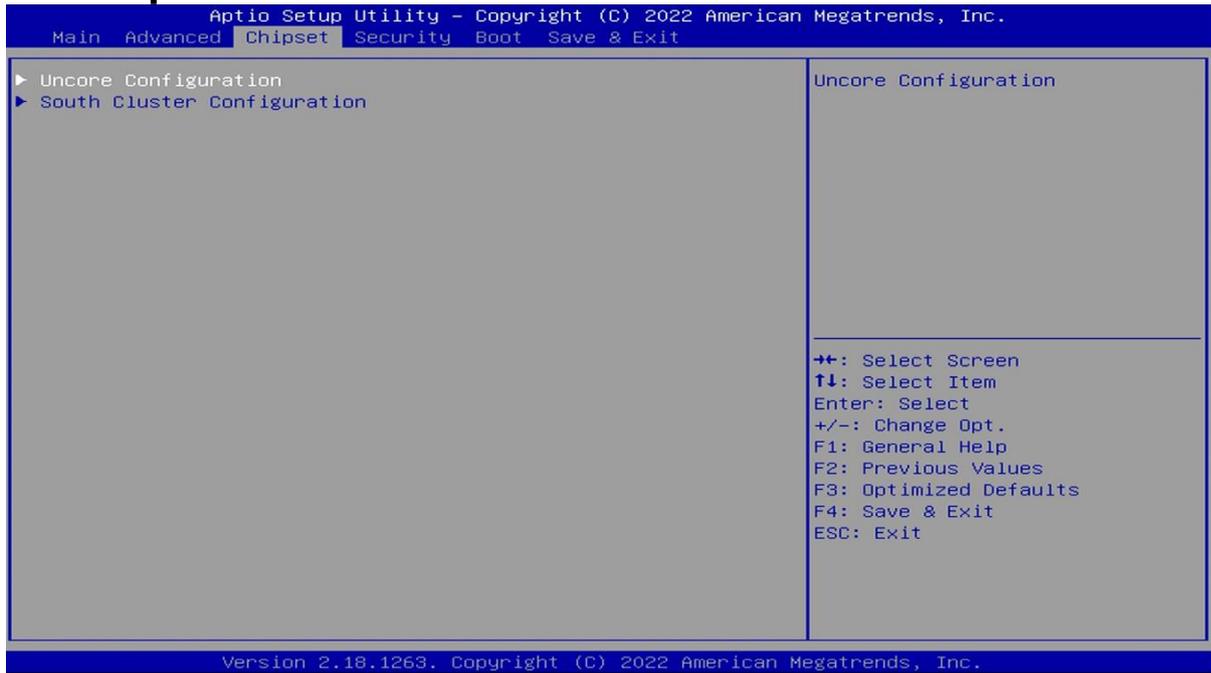
Use this item to enable or disable fTPM.

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

▶ **Intel(R) Ethernet Controller I225-V- XX:XX:XX:XX:XX:XX**

▶ **Intel(R) Ethernet Controller I225-V- XX:XX:XX:XX:XX:XX**

3-8 Chipset Menu



▶ **Uncore Configuration**

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

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: [64M]; [96M]; [128M]; [160M]; [192M]; [224M]; [256M]; [288M]; [320M]; [352M]; [384M]; [416M]; [448M]; [480M]; [512M].

DVMT Total Gfx Memory

Use this item to select DVMT5.0 Total Graphics Memory size.

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

Active LVDS

Use this item to enable or disable LVDS.

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

When set as [Enabled], the following item shall appear for setting:

LCD Panel Type

Use this item to select LCD panel used by Internal Graphics Device by selecting the appropriate setup item.

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].

GMCH BLC Control

Use this item to control Back Light Control Setting.

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

Primary IGFX Boot Display

Use this item to select the Video Device which will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on selection. VGA modes will be supported only on primary display.

The optional settings are: [Auto]; [eDP]; [HDMI]; [LVDS].

**This item is only supported when 'Active LVDS' is set as [Enabled]. Please enable Active LVDS before activating this function.*

Secondary IGFX Boot Display

Use this item to select Secondary Display Device

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

**This item is only supported when 'Active LVDS' is set as [Enabled]. Please enable Active LVDS before activating this function.*

Memory Information

The working memory information will be on display.

▶ **South Cluster Configuration**

Press [Enter] to further setting South Cluster Configuration.

▶ **PCI Express Configuration**

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

Peer Memory Write Enable

Use this item to enable or disable Peer Memory Write.

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

Compliance Mode

Use this item to enable or disable Compliance Mode.

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

Onboard PCIE LAN1

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

Onboard PCIE LAN2

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

▶ **SATA Configuration**

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

SATA Controller

Use this item to enables or disables the chipset SATA Controller. The Chipset SATA controller supports the 2 black internal SATA ports (up to 3Gb/s supported per port).

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

When set as **[Enabled]**, users can make more settings for following sub-items:

SATA Mode Selection

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

The default setting is: [AHCI].

SATA Port

SATA Port

Use this item to enable or disable SATA Port.

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

M.2

M.2

Use this item to enable or disable M.2 SATA port.

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

HD-Audio Support

Use this item to enable or disable HD-Audio support.

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

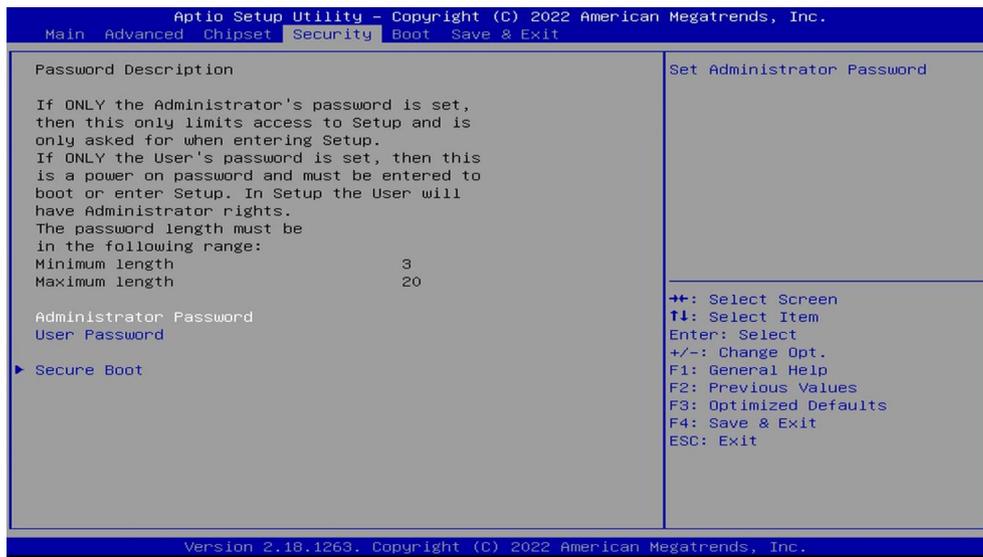
System State after Power Failure

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

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

***Note:** *[Always On] and [Former State] options are affected by ERP function. Please disable ERP to support [Always On] and [Former State].*

3-9 Security Menu



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

Setup 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:

Secure Boot Control

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

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

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

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

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

▶ **Key Management**

This item enables experienced users to modify Secure Boot variables, which

includes the following items:

Provision Factory Default Keys

Use this item to install factory default Secure Boot Keys when System is in Setup Mode.

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

▶ **Enroll All Factory Default Keys**

Use this item to force System to User Mode- install all Factory Default Keys.

▶ **Save All Secure Boot Variables**

Use this item to save NVRAM content of all secure boot variables to the files (EFI_SIGNATURE_LIST data format) in root folder on a target file system device

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

Use this item to enroll Factory Defaults or load the keys from a file with:

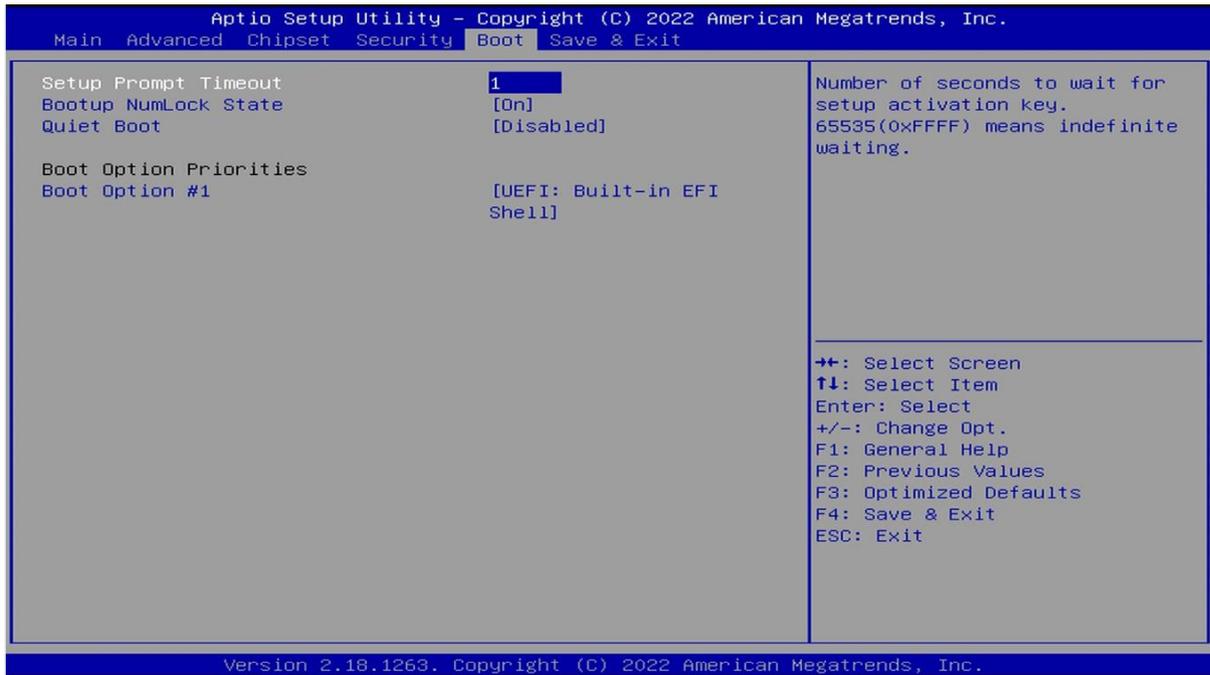
1. Public Key Certificate in:

- a) EFI_SIGNATURE_LIST
- b) EFI_CERT_X509 (DER)
- c) EFI_CERT_RSA2048 (bin)
- d) EFI_CERT_SHA256 (bin)

2. Authenticated UEFI Variable

Key: Vendor, Custom, Mixed, Test (*) modified from Setup menu.

3-10 Boot Menu



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 are: [On]; [Off].

Quiet Boot

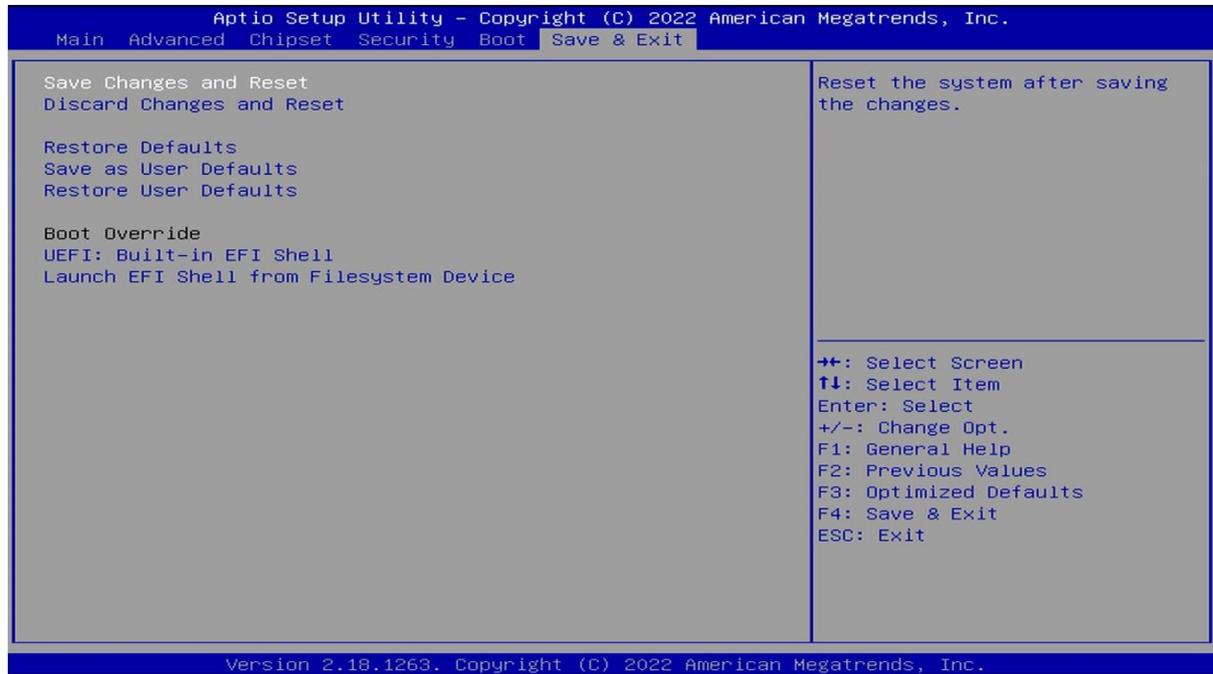
Use this item to enable or disable Quiet Boot option. The optional settings are: [Disabled]; [Enabled].

Boot Option Priorities

Boot Option #1

Use this item to decide system boot order from available options.
The optional settings are: [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

Use this item to save configuration and reset.

Launch EFI Shell from Filesystem Device

This item attempts to Launch EFI Shell application (Shell.efi) from one of the available filesystem devices.