LE30 Series

User's Manual

NO. G03-LE30-F

Revision: 1.0

Release date: August 31, 2023

Trademark:

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.

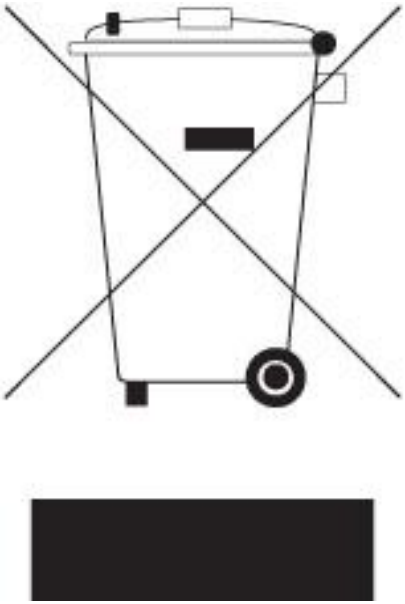


TABLE OF CONTENT

Environmental Safety Instruction

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

USER'S NOTICE

Manual Revision Information

Reversion	Revision History	Date
1.0	First Edition	August 31, 2023

Item Checklist

☑ Motherboard

Chapter 1
Introduction of the Motherboard

1-1 Feature of Motherboard

- Onboard Intel® Tiger Lake-UP3 SoC serial processor (TDP 12~28W)
  Support 1* DDR4 3200MHz SO-DIMM up to 32GB
- Integrated with 2* Intel i225-V 2.5 GbE LAN chip
- 1* HDMI2.0b port, 1*VGA & 1* EDP & 1* 24-bits LVDS Output
- Support 2* RS232/422/485COM port & 2* RS232COM port
- Support 4* USB3.2 (Gen.2) ports and 2* USB2.0 ports
- Support 1* SATAIII (6Gb/s) Device & 1* M.2 M-key (2242/2280) slot
- Onboard 1* M.2 E-key(2230) slot,1* M.2 B-key (3042/3052) slot
- 2* Mixture Header expansible for 1* PSKBMS, 1* 8-bit GPIO, 2* RS232 COM ports (from **CN_MIXTURE-IO1**) & 1* PCI-Ex1 interface,3* USB2.0 ports and1* LPC (from **CN_MIXTURE-IO2**)
- Onboard TPM 2.0 (optional)
- Support CPU Smart FAN function
- Supports ACPI S3 Function
- Support Watchdog Timer Technology

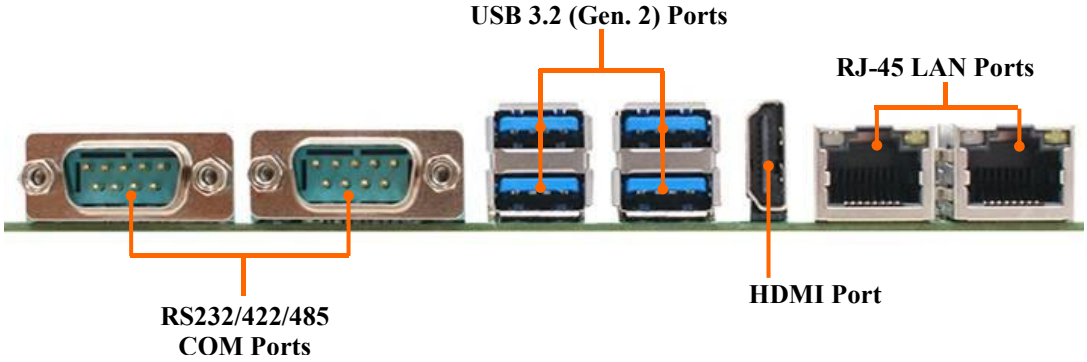
1-2 Specification

Spec	Description
Design	● 5.5” EPIC form factor; 8-layers; PCB size: 120x168mm
Embedded CPU	● Integrated Intel® Tiger Lake series CPU **For detailed CPU support information please visit our website*
Memory Slot	● 1* DDR4 SO-DIMM slot support 1* DDR4 3200MHz up to 32GB
Expansion Slot	● ***M2E1:***1* M.2 E-key 2230 slot(USB2.0/PCIex1 interface) supports CNVi ● ***M2B1:***1*M.2 B-key 3042/3052 slot (USB2.0/PCIex1 interface) supports 3G/4G Module ● ***SIMCARD1:***1* Nano-SIM card slot; co-function with **M2B1** slot
Storage	● ***M2M1:*** 1* M.2 M-key 2242/2280 slot (PCIe 4.0x4 interface) supports NVMe/SATA ● 1* SATAIII 6G/s connector
LAN Chip	● Integrated with 2* Intel i225-V 2.5GbE PCIe LAN chip ● Support 10/100/1000/2500Mbps Ethernet data transfer rate ****Note: 2500Mbps** high-speed transmission rate is **only** supported over **CAT 5e UTP cable**.*
BIOS	● AMI 128Mb Flash ROM
Rear I/O	● 2* COM ports support RS232/422/485 **(COM1/COM2)** ● 4* USB 3.2 (Gen.2) ports ● 1* HDMI port ● 2* 2.5GbE RJ-45 LAN ports
Internal I/O	● 1* 12V~24V internal power jack **(DC_IN1)** ● 1 * SATA HDD power-out connector ● 1* CPUFAN1 connector ● 1* CMOS battery connector ● 1* Front panel hearer ● 2* Serial port headers support RS232**(COM5/COM6)**

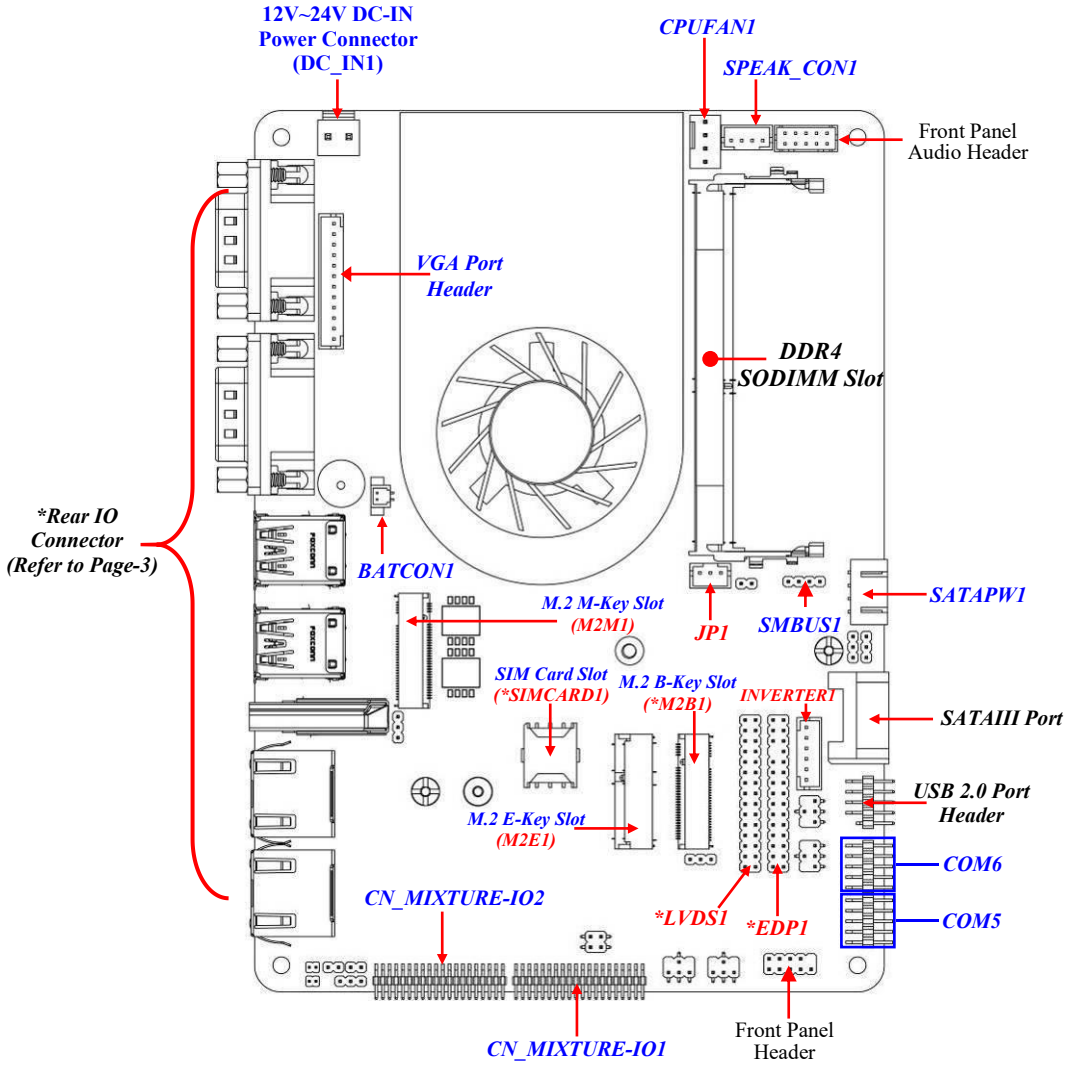
	● 1* 9-Pin USB 2.0 header ● 1* LVDS header **(*co-lay EDP1)** ● 1* EDP header **(*co-lay LVDS1)** ● 1* Inverter wafer ● 1* LCD backlight control wafer **(JP1)** ● 1* SMBUS header ● 1* Front panel audio header ● 1* 2W 8Ω Speaker wafer ● 2* **Mixture headers** support 2* UART, 3* USB2.0, 1* LPC, 1* 8-bit GPIO, 1* PCI-Ex1

1-3 Layout Diagram

Rear IO Diagram



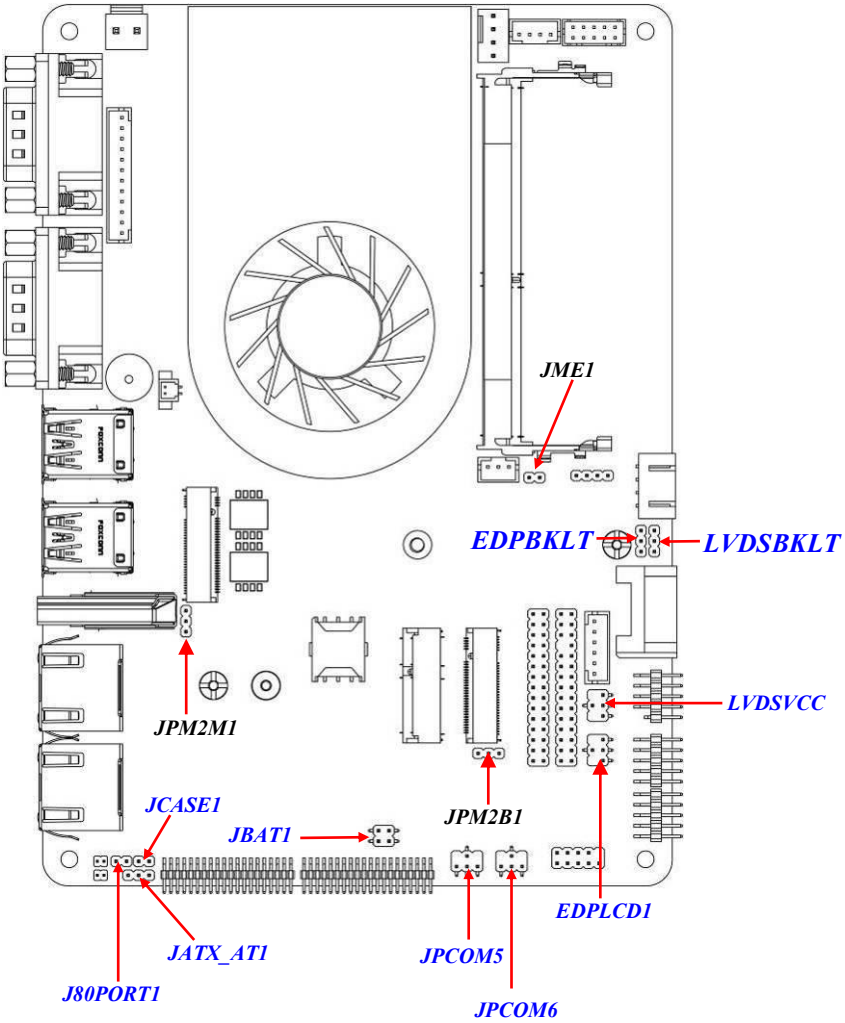
Motherboard Internal Diagram-Front



***Note:** **1**.the board co-lays **LVDS1** and **EDP1**, but user can only choose one of them to function.*

***2. SIMCARD1** slot only work when compatible SIM card installed & 3G/4G LAN card installed in **M2B1** M.2 B-key slot.*

Motherboard Jumper Position



Jumpers:

Jumper	Function	Description	Pitch
JPCOM5	COM5 Header Pin9 Function Select	4-pin Block	2.0mm
JPCOM6	COM6 Header Pin9 Function Select	4-pin Block	2.0mm
JBAT1	PIN (1-2) = Clear CMOS PIN (3-4) = Clear ME_RTC	4-pin Block	2.0mm
JATX_AT1	ATX Mode / AT Mode Select	3-pin Block	2.0mm
JCASE1	Case Open Display Select	2-pin Block	2.0mm
J80PORT1	GPIO/80 Port Function Select	2-pin Block	2.0mm
JPM2M1	M2M1 Slot VCC Select	3-pin Block	2.0mm
JPM2B1	M2B1 Slot VCC Select	3-pin Block	2.0mm
JME1	ME_Features Select	2-pin Block	2.0mm
LVDSVCC	LVDS LCD Panel Power Select	4-pin Block	2.0mm
EDPLCD1	EDP LCD Panel Power Select	4-pin Block	2.0mm
LVDSBKLT	LVDS LCD Backlight Power Select	3-pin Block	2.0mm
EDPBKLT	EDP Backlight Power Select	3-pin Block	2.0mm

Switch:

Switch	Function	Description	Pitch
SW1 & SW2	**M2M1** SATA/PCIE Function Select	8-Key Block	1.27mm

Connectors

Connector	Name
COM1	RS232/422/485 Serial Port Connector
COM2	RS232/422/485 Serial Port Connector
USB2	USB 3.2 (Gen.2) Port Connector X2
USB1	USB 3.2 (Gen.2) Port Connector X2
HDMI1	HDMI Port Connector
LAN2/LAN1	2.5GbE RJ-45 LAN Connector
DC_IN1	12V~24V DC-In Power Jack
CPUFAN1	CPUFAN Connector
SATA1	SATAIII Port Connector
SATAPW1	SATA HDD Power-Out Connector
BATCON1	CMOS Battery Connector

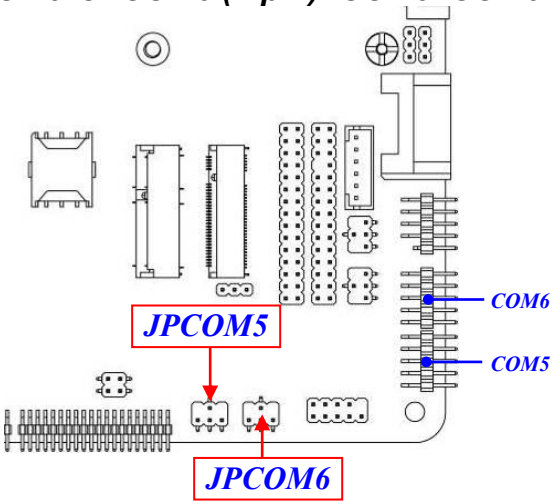
Headers & Wafers

Header	Name	Description	Pitch
JW_FP1	Front Panel Header (PWR LED/ HD LED/Power Button /Reset)	9-pin Block	2.0mm
COM5/ COM6	Serial Port Header	9-pin Block	2.0mm
F_USB1	USB 2.0 Port Header X1	9-pin Block	2.0mm
LVDS1	LVDS Port Header	30-pin Block	2.0mm
EDP1	EDP Port Header	29-pin Block	2.0mm
INVERTER1	Inverter Wafer	6-pin Block	2.0mm
JP1	LCD Backlight Control Wafer	3-pin Block	2.0mm
VGA1	VGA Port Wafer	12-pin Block	2.0mm
SMBUS1	SMBUS Header	4-pin Block	2.0mm
FP_AUDIO1	Front Panel Audio Header	10-pin Block	2.0mm
SPEAK_CON1	2W 8Ω Amplifier Wafer	4-pin Block	2.0mm
CN_MIXTURE-IO1/ CN_MIXTURE-IO2	Mixture Header X1	40-pin Block	1.27mm

Chapter 2
Hardware Installation

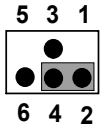
2-1 Jumper & Switch Settings

JPCOM5/ JPCOM6 (4-pin): COM5 /COM6 Port Pin9 Function Select

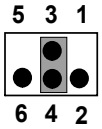


JPCOM5 → COM5 Header Pin-9

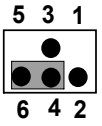
JPCOM6 → COM6 Header Pin-9



2-4 Closed: PIN9=RS232;

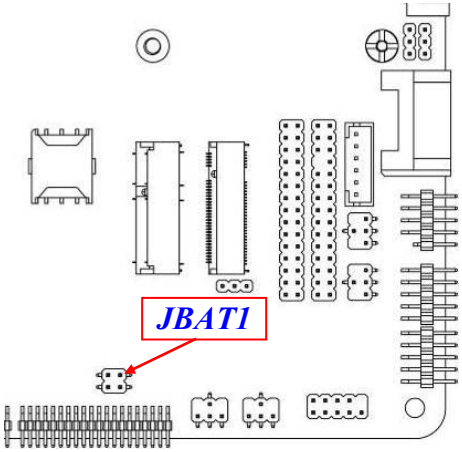


3-4 Closed: PIN9=+5V;

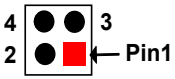


4-6 Closed: PIN9=+12V

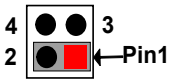
Pin (1-2) of JBAT1 (4-pin): Clear CMOS Setting



PIN(1-2) of JBAT1: Clear CMOS

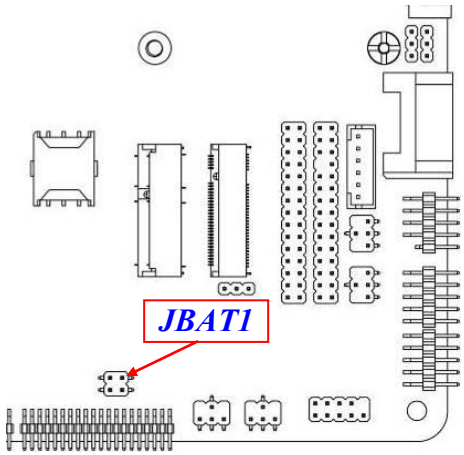


1-2 Open: Normal(Default);

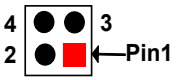


1-2 Closed: Clear CMOS.

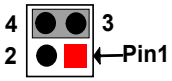
Pin (3-4) of JBAT1 (4-pin): Clear ME_RTC



PIN(3-4) of JBAT: Clear ME_RTC

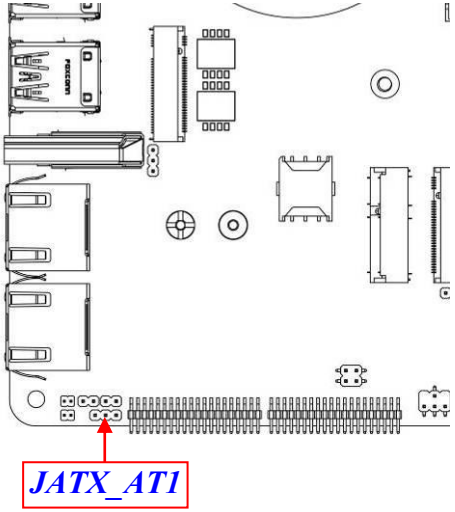


3-4 Open: Normal(Default);

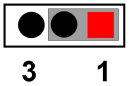


3-4 Closed: Clear ME_RTC.

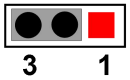
JATX_AT1 (3-pin): AT Mode /ATX Mode Select



JATX_AT1→ATX/AT Mode Select



1-2 Closed: ATX Mode Selected;

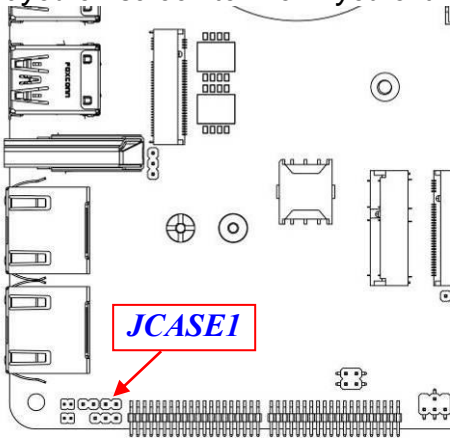


2-3 Closed: AT Mode Selected.

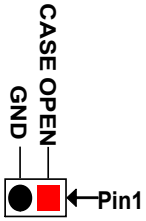
***ATX Mode Selected:** Press power button to power on after power input ready;*
***AT Mode Selected:** Directly power on as power input ready.*

JCASE1 (2-pin): Case Open Message Display Function

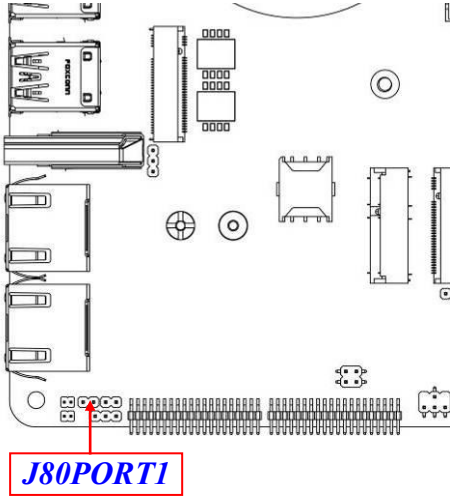
Pin (1&2) Short: *When Case open function pin short to GND, the Case open function was detected. When used, needs to enter BIOS and enable 'Case Open Detect' function. In this case if your case is removed, next time when you restart your computer, a message will be displayed on screen to inform you of this.*



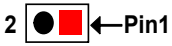
JCASE1→Case Open Detection



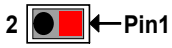
J80PORT1 (2-pin): GPIO/80 Port Select



J80PORT1→GPIO/80 Function Select

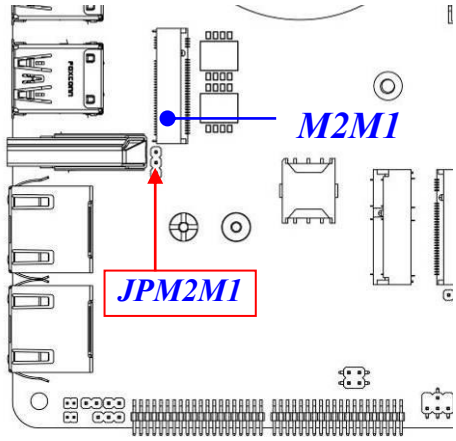


1-2 Open: Function as 80 Port;

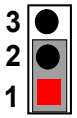


1-2 Closed: Function as GPIO Port.

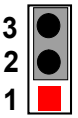
JPM2M1 (3-pin): M2M1 Slot Power VCC



JPM2M1→M2M1 Slot Power VCC

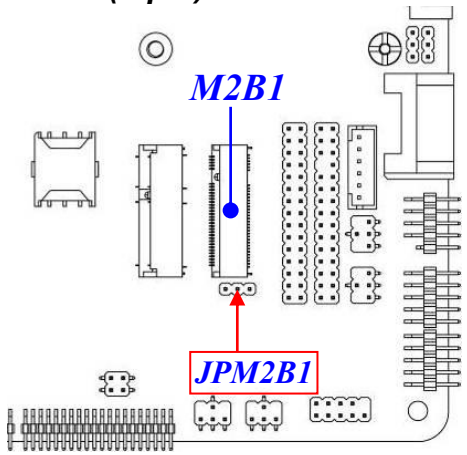


1-2 Closed=3VSB;

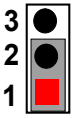


2-3 Closed: VCC3.

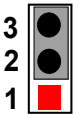
JPM2B1 (3-pin): M2B1 Slot Power VCC



JPM2B1→M2B1 Slot Power VCC

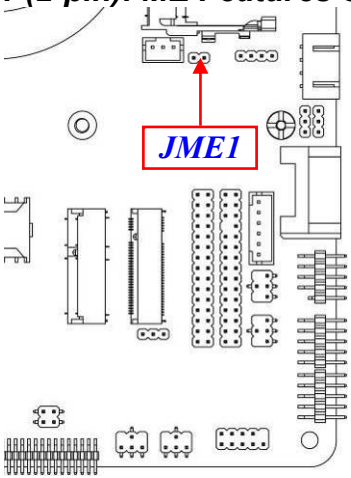


1-2 Closed=3VSB;



2-3 Closed: VCC3.

JME1 (2-pin): ME Features Select

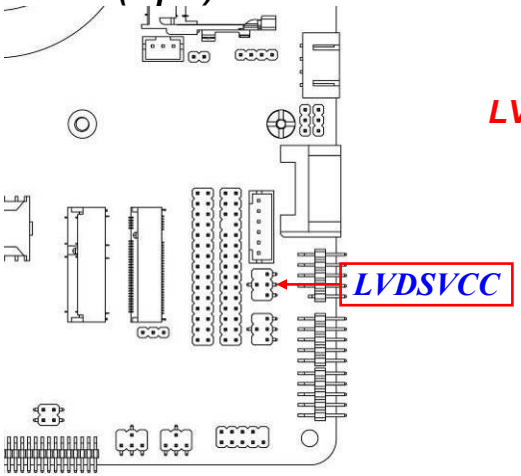


JME1→ ME Features Select

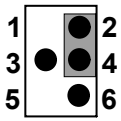
1-2 Open: Enable ME Features;

1-2 Closed: Disable ME Features.

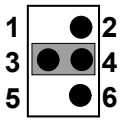
LVDSVCC (4-pin): LVDS LCD Panel Power VCC Select



LVDSVCC→LVDS Panel Power VCC Select



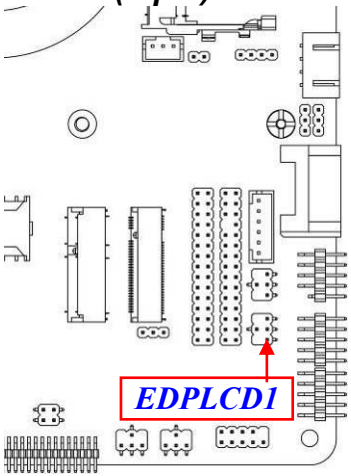
2-4 Closed:
VCC=3.3V



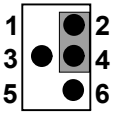
3-4 Closed:
VCC=5V

*****Warning!** Wrong voltage setting will result in screen burn out.*

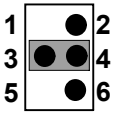
EDPLCD1 (4-pin): EDP Panel Power VCC Select



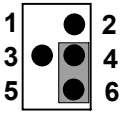
EDPLCD1→EDP Panel Power VCC Select



2-4 Closed:
VCC=3.3V



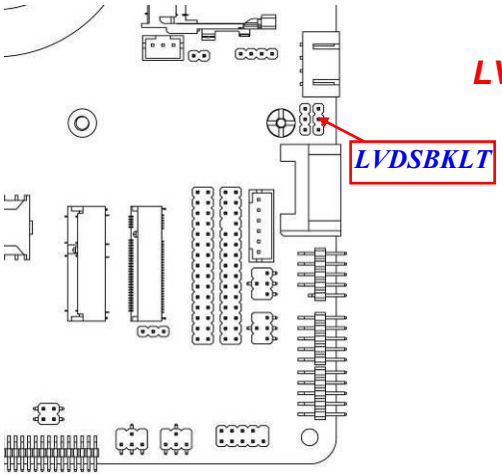
3-4 Closed:
VCC=5V



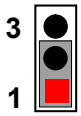
4-6 Closed:
VCC= 12V

*****Warning!** Wrong voltage setting will result in screen burn out.*

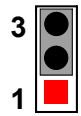
LVDSBKLT (3-pin): LVDS LCD BACKLIGHT VCC Select



LVDSBKLT→LVDS Backlight Power VCC

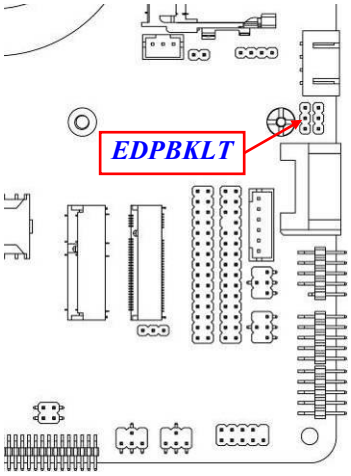


1-2 Closed: VCC=+5V;

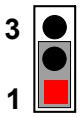


2-3 Closed: VCC=+12V.

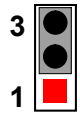
EDPBKLT (3-pin): EDP LCD BACKLIGHT VCC Select



EDPBKLT→EDPBacklight Power VCC

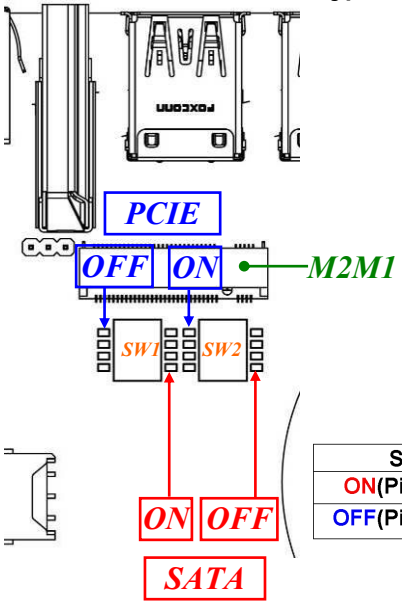


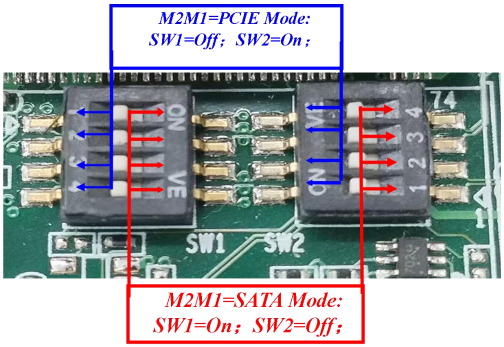
1-2 Closed: VCC=+5V;



2-3 Closed: VCC=+12V.

SW1 (8-key) & SW2 (8-key): M2M1 Slot SATA/PCIE Function Select

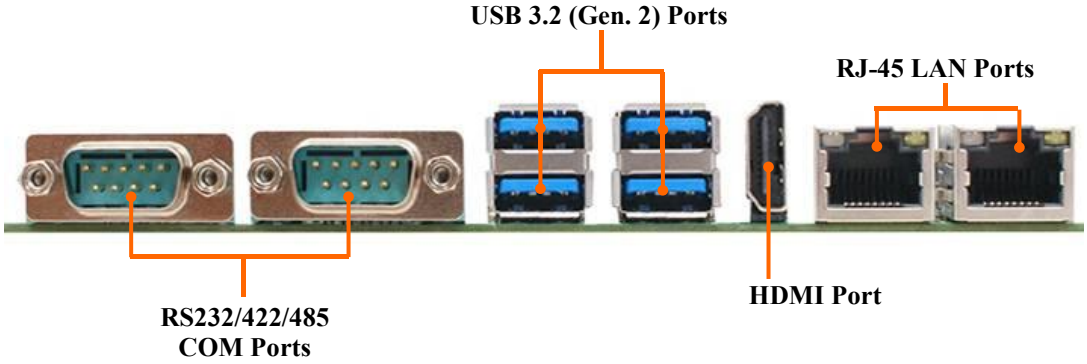




SW1 & SW2

SW1	SW2	Switch Keys	M2M1 Function as
ON(Pin5/6/7/8)	OFF(Pin1/2/3/4)	→	SATA
OFF(Pin1/2/3/4)	ON(Pin5/6/7/8)	←	PCIE

2-2 Connectors, Headers and Wafers
2-2-1 Connectors
(1) Rear Panel Connectors

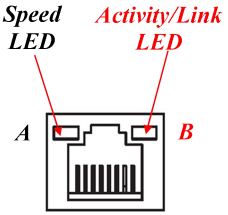


Icon	*Name*	*Function*
	**RS232/422/485 Serial Port**	Mainly for user to connect external MODEM or other devices that supports Serial Communications Interface.
	**USB 3.2 Ports**	To connect USB keyboard, mouse or other devices compatible with USB specification. USB 3.2 (Gen.2) ports support up to 10Gbps data transfer rate.
	**HDMI Port**	To connect display device that support HDMI specification.
	**RJ-45 LAN Port**	This connector is standard RJ-45 LAN jack for Network connection which supports10/100/1000/2500 Mbps Ethernet data transfer rate ***(*Note: 2.5Gbps** is **only** supported with **CAT 5e UTP cable).***

(1) 2.5GbE RJ-45 Ethernet Connectors

*** There are two LED next to the RJ-45 LAN port. Please refer to the table below for LAN port LED indications.*

For 2.5Gbps RJ-45 LAN port LED Signals:



A: Speed LED

Status	Description
Orange	10/100/1000Mbps connection
Green	2.5Gbps connection

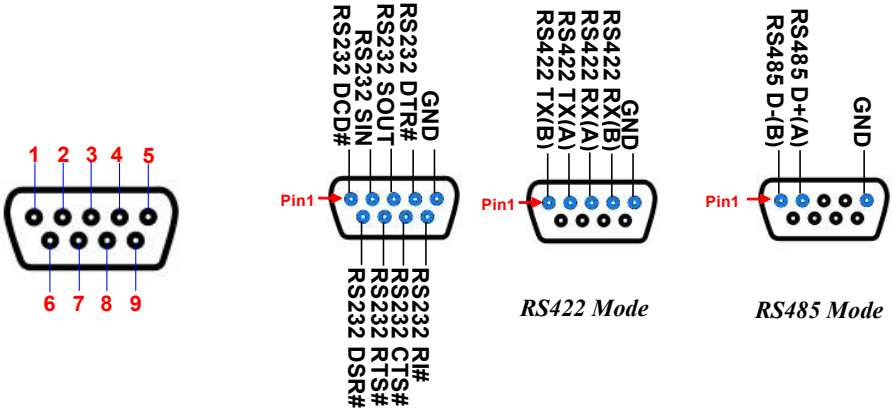
B: Activity/Link LED

Status	Description
Off	No Link
Blinking	Data Activity
On	Link

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

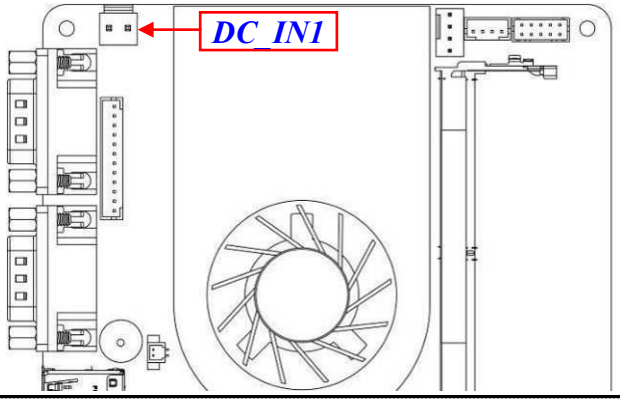
(2) COM1/COM2 (9-pin Block): RS232/422/485 Serial Port

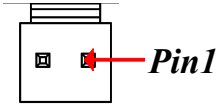
The pin assignment for RS-232/ 422/ 485 is listed as follows:



COM1 & COM2 port can function as RS232/422/485 port. In default settings COM1/2 functions as RS232 port. With compatible COM cable COM1 can function as RS422 or RS 485 port. User also needs to go to BIOS to set **'Transmission Mode Select'** for COM1/2 at first, before using specialized cable to connect different pins of this port.

(3) DC_IN1(2-pin) : 12V~24V DC-in Power Connector

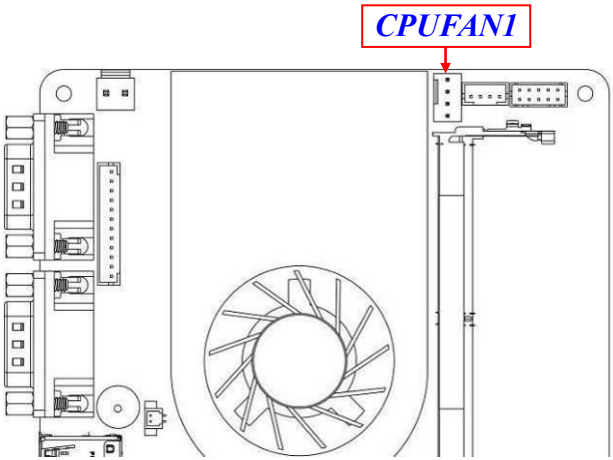


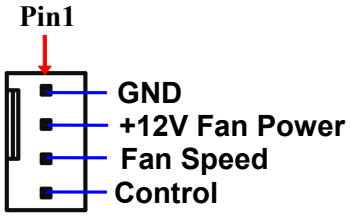


Pin No.	Definition
1	+12V~24V VCC
2	GND

Warning: *Find Pin-1 position before connecting power cable to this 3-pin power connector.* ***WRONG INSTALLATION DIRECTION WILL DAMAGE THE BOARD!!***

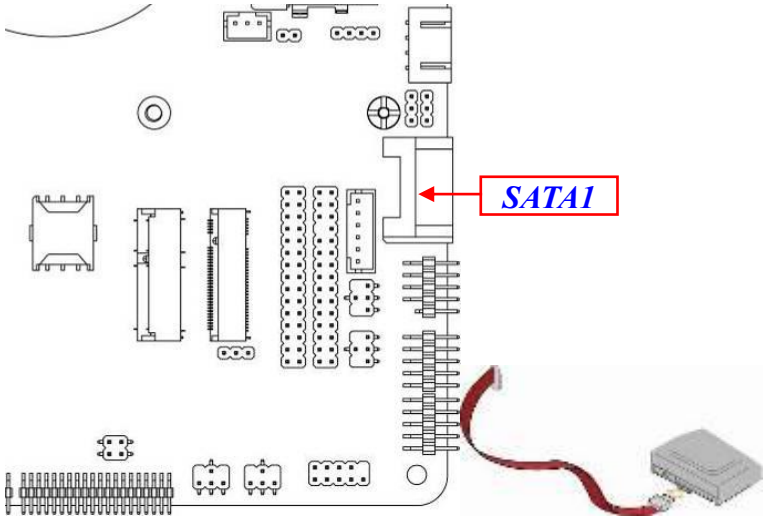
(4) CPUFAN1 (4-pin):CPU Fan Connector





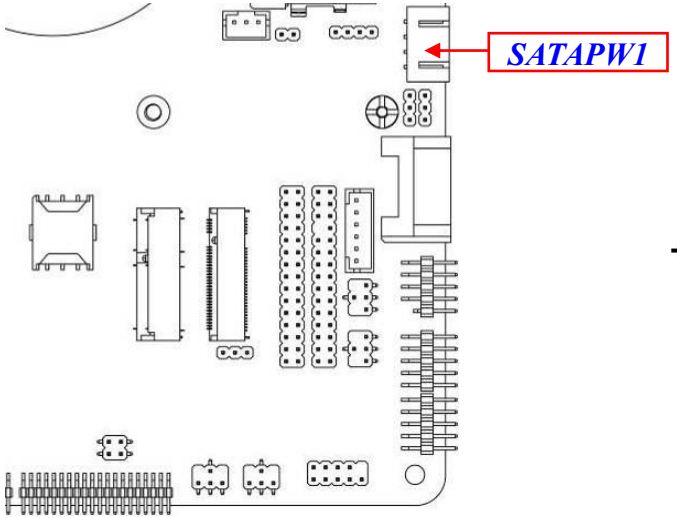
(5) SATA1 (7-pin block):SATAIII Port connector

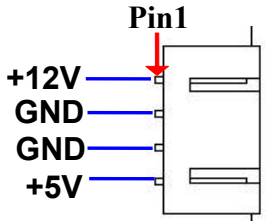
The board comes with a SATAIII port supporting 6GB/s transfer rate.



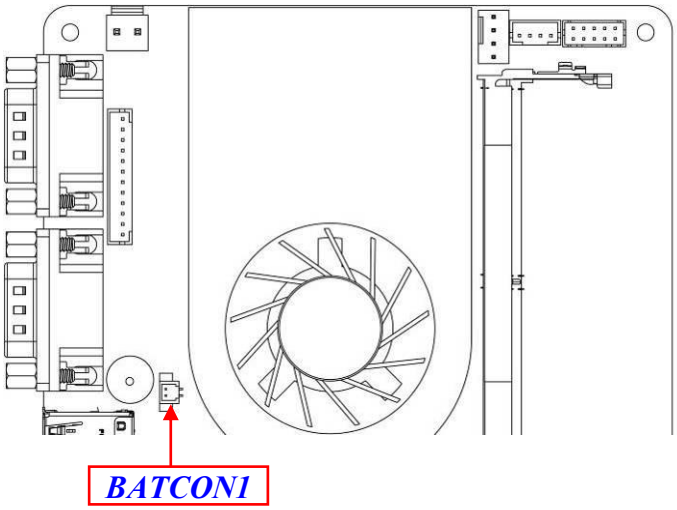
Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

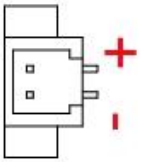
(6) SATAPW1 (4-pin): SATA HDD Power-out Connector





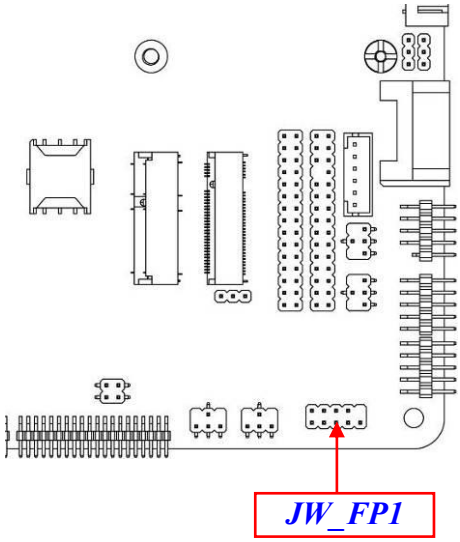
(7) BATCON1 (2-pin): Battery Connector

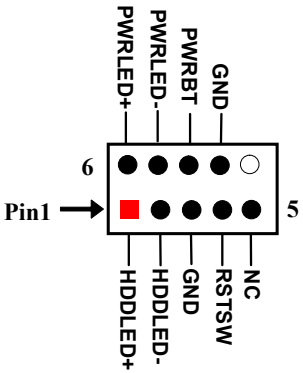




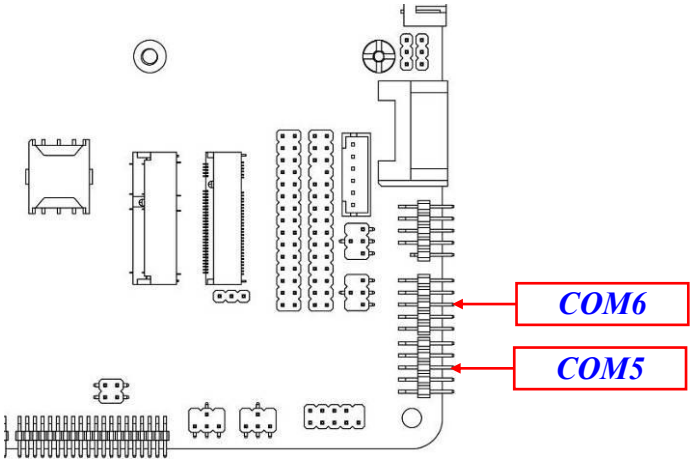
2-2-2 Pin Definition for Headers & Wafers

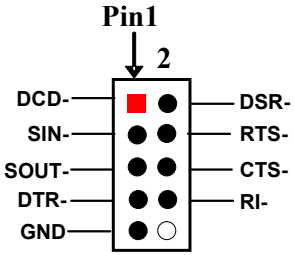
(1) JW_FP1 (9-pin): Front Panel Header



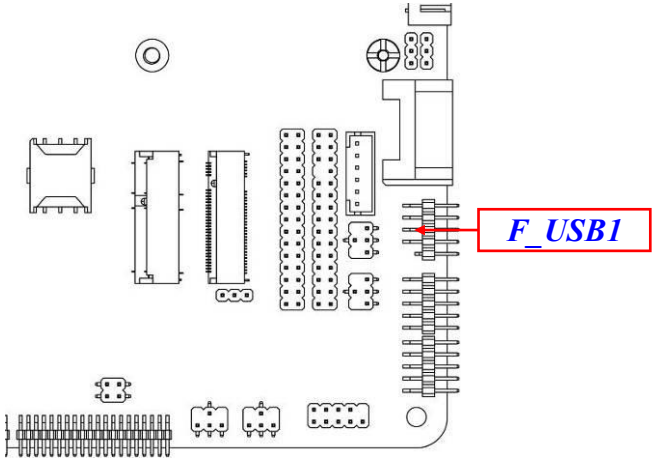


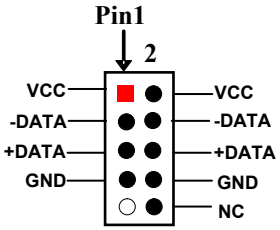
(2) COM5/COM6(9-pin): RS232 Serial Port Header



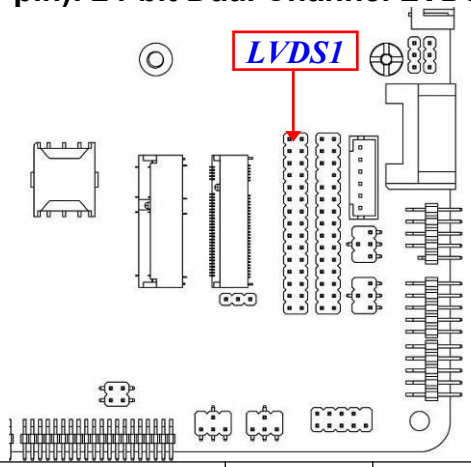


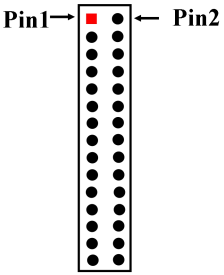
(3) F_USB1 (9-pin): USB 2.0 Port Header





(4) *LVDS1 (30-pin): 24-bit Dual Channel LVDS Header



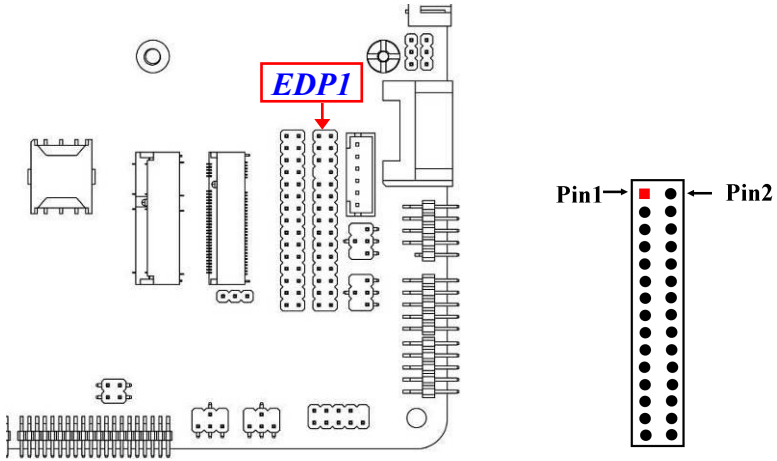


Pin Define	Pin NO.	Pin NO.	Pin Define
LCD_VCC	**Pin 1**	**Pin 2**	LCD_VCC
LCD_VCC	**Pin 3**	**Pin 4**	GND
GND	**Pin 5**	**Pin 6**	GND
LVDSA_DATAN0	**Pin 7**	**Pin 8**	LVDSA_DATAP0
LVDSA_DATAN1	**Pin 9**	**Pin 10**	LVDSA_DATAP1
LVDSA_DATAN2	**Pin 11**	**Pin 12**	LVDSA_DATAP2
GND	**Pin 13**	**Pin 14**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

Note*: *1.Please follow the settings of **LVDS VCC** for **LVDS panel power VCC.

***2.** The board co-lays **LVDS1** and **EDP1**, but user can only choose one of them to function.*

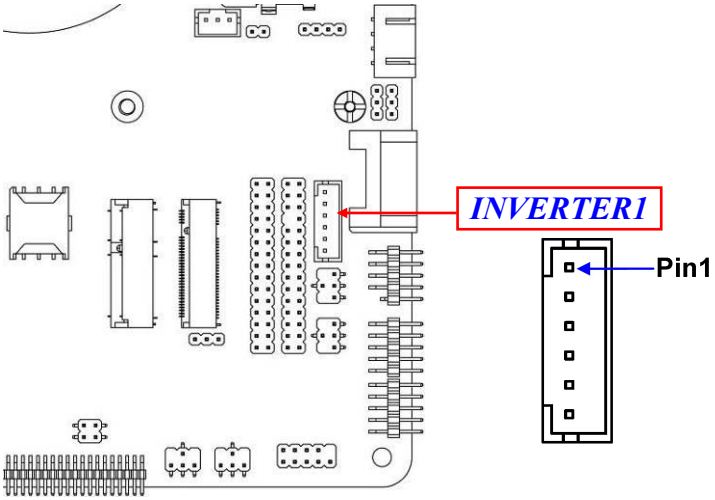
(5) *EDP1 (29-pin): eDP Header



Pin Define	Pin NO.	Pin NO.	Pin Define
EDP_BKLT_PWR	**Pin 1**	**Pin 2**	EDP_BKLT_PWR
EDP_BKLT_PWR	**Pin 3**	**Pin 4**	GND
GND	**Pin 5**	**Pin 6**	NC
NC	**Pin 7**	**Pin 8**	EDP_SCL
EDP_LCD_VCC	**Pin 9**	**Pin 10**	EDP_SDA
EDP_LCD_VCC	**Pin 11**	**Pin 12**	BKLTCTL
GND	**Pin 13**	**Pin 14**	GND
EDP_BKLT_EN	**Pin 15**	**Pin 16**	EDP_AUXP
EDP_HPD	**Pin 17**	**Pin 18**	EDP2_AUXN
GND	**Pin 19**	**Pin 20**	GND
EDP_DATA3P	**Pin 21**	**Pin 22**	EDP_DATA3N
EDP_DATA2P	**Pin 23**	**Pin 24**	EDP_DATA2N
GND	**Pin 25**	**Pin 26**	GND
GND EDP2_DATA1P	**Pin 27**	**Pin 28**	EDP_DATA1N
EDP2_DATA0P	**Pin 29**	**Pin 30**	EDP_DATA0N

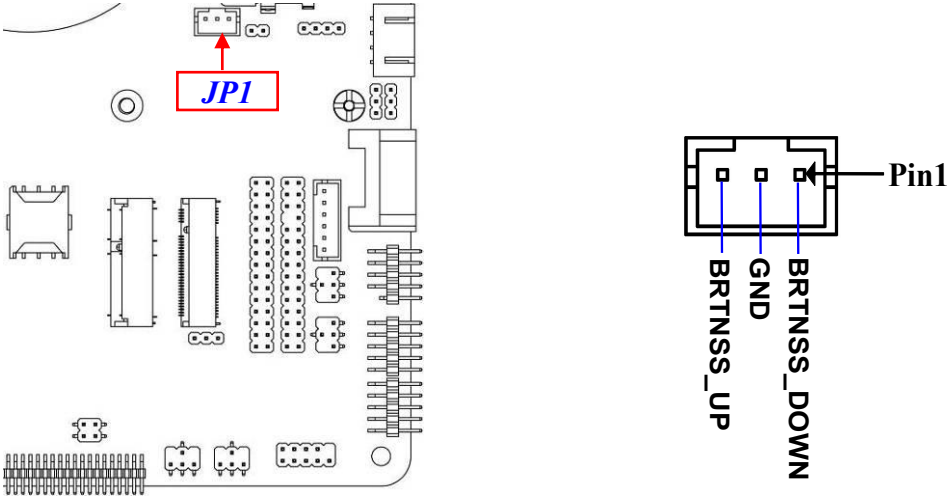
***Note:** **1.**Please follow the setting of **EDPLCD1 for EDP Power VCC;** follow the setting of **EDPBKLT** for EDP backlight power VCC; **2.the board co-lays LVDS1 and EDP1**, but user can only choose one of them to function.*

(6) INVERTER1 (6-pin): LVDS Inverter Connector

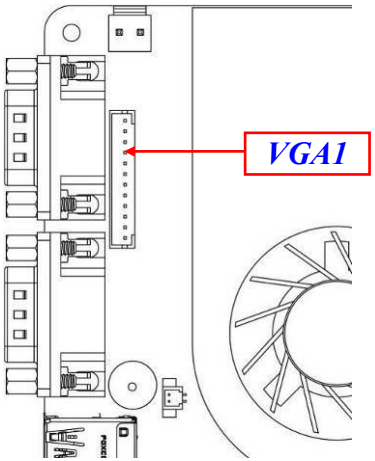


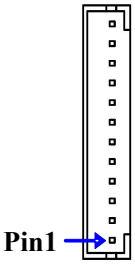
Pin No.	Definition
1	Backlight Power
2	Backlight Power
3	Backlight Enable
4	Backlight PWM
5	GND
6	GND

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



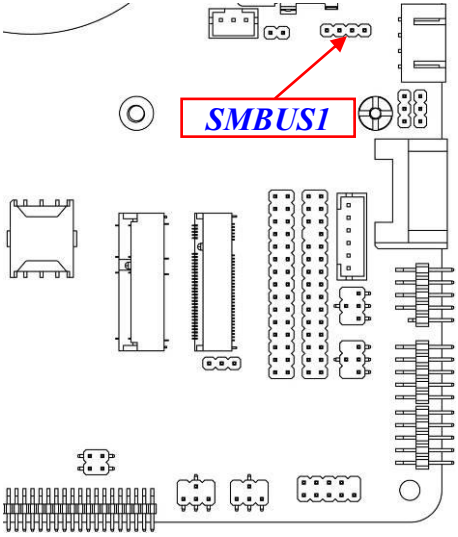
(8) VGA1 (12-Pin): VGA Port Header

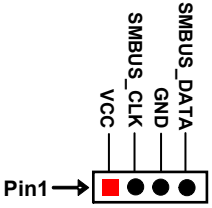




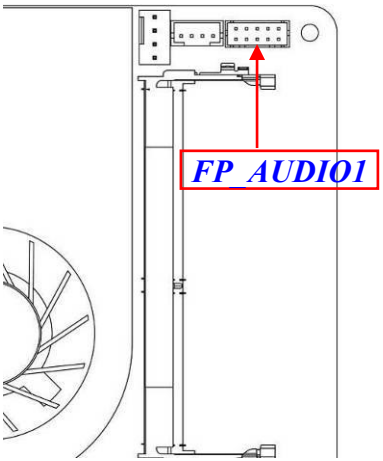
Pin No.	Definition
1	VCC5(Reserved)
2	VGA_VSYNC
3	VGA_HSYNC
4	GND_RED
5	RED_VGA
6	GND_GRN
7	GRN_VGA
8	GND_BLUE
9	BLUE_VGA
10	GND
11	DDC_DATA
12	DDC_CLK

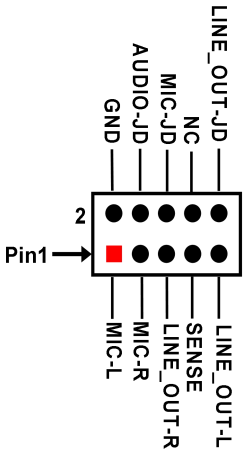
(9) SMBUS1 (4-Pin): SMBUS Header



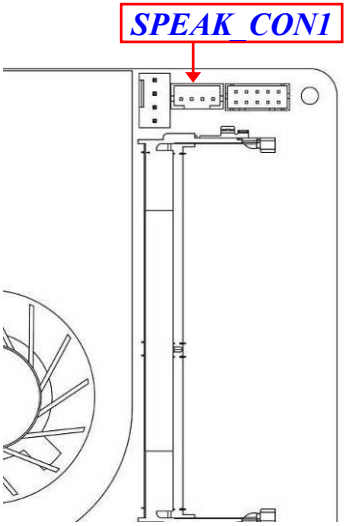


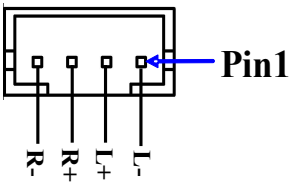
(10) FP_AUDIO1 (10-Pin): Front Panel Audio Header



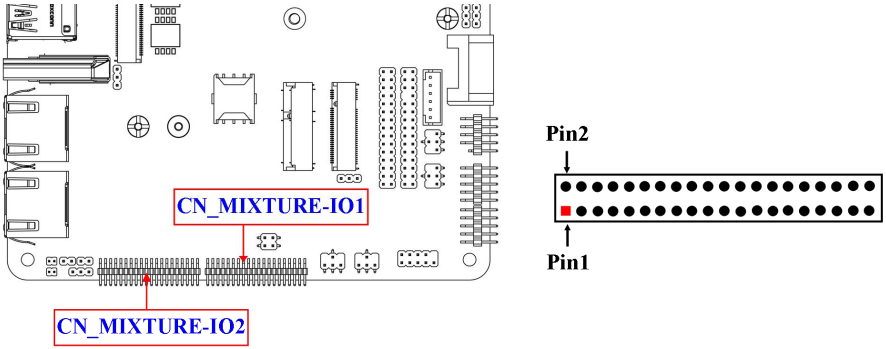


(11) SPEAK_CON1 (4-pin): 2W 8Ω Amplifier Wafer





(12) CN_MIXTURE-IO1/2 (40-pin): Multi-Function Mixture Header



CN_MIXTURE-IO1 supports expansion of:

1* PS/2 Keyboard & mouse; 1*8-bit GPIO; 2*RS232 COM port (COM3/COM4).

Pin Definition			
Pin Define	**Pin NO.**	**Pin NO.**	**Pin Define**
RTC_RST_N	**Pin 1**	**Pin 2**	FP_SPSW
GND	**Pin 3**	**Pin 4**	GND
GND	**Pin 5**	**Pin 6**	VCC
KBCL	**Pin 7**	**Pin 8**	MDA
MCL	**Pin 9**	**Pin 10**	KBDA
VCC	**Pin 11**	**Pin 12**	GND
SIO_GPIO80	**Pin 13**	**Pin 14**	SIO_GPIO81
SIO_GPIO82	**Pin 15**	**Pin 16**	SIO_GPIO83
SIO_GPIO84	**Pin 17**	**Pin 18**	SIO_GPIO85
SIO_GPIO86	**Pin 19**	**Pin 20**	SIO_GPIO87
VCC3	**Pin 21**	**Pin 22**	+12V
DTR3-	**Pin 23**	**Pin 24**	DCD3-
DSR3-	**Pin 25**	**Pin 26**	SIN3
RTS3-	**Pin 27**	**Pin 28**	SOUT3
CTS3-	**Pin 29**	**Pin 30**	GND
DTR4-	**Pin 31**	**Pin 32**	RI3-
DSR4-	**Pin 33**	**Pin 34**	DCD4-
RTS4-	**Pin 35**	**Pin 36**	SIN4
CTS4-	**Pin 37**	**Pin 38**	SOUT4
RI4-	**Pin 39**	**Pin 40**	GND

***GPIO** can function as 80Port or GPIO port via **J80PORT1** jumper setting (refer to **Page-10** for **J80PORT1** description).*

- ***J80PORT1 Pin1-2 Open:** function as 80Port;*
- ***J80PORT1 Pin1-2 Closed:** function as Normal 8-bit GPIO.*

CN_MIXTURE-IO2 supports expansion of:

1* PCI-Ex1 Interface; 3*USB 2.0 Port; 1*LPC.

Pin Definition			
Pin Define	**Pin NO.**	**Pin NO.**	**Pin Define**
SRCCLKREQ6_N	**Pin 1**	**Pin 2**	VCC
PCIE9_RXP	**Pin 3**	**Pin 4**	USB2_P9_P
PCIE9_RXN	**Pin 5**	**Pin 6**	USB2_P9_N
GND	**Pin 7**	**Pin 8**	GND
CLK_SRC6_DP	**Pin 9**	**Pin 10**	1USB_HUB_DM3
CLK_SRC6_DN	**Pin 11**	**Pin 12**	1USB_HUB_DP3
GND	**Pin 13**	**Pin 14**	VCC
PCIE9_TXN	**Pin 15**	**Pin 16**	1USB_HUB_DM4
PCIE9_TXP	**Pin 17**	**Pin 18**	1USB_HUB_DP4
GND	**Pin 19**	**Pin 20**	GND
SMBCLK	**Pin 21**	**Pin 22**	VCC3
SMBDATA	**Pin 23**	**Pin 24**	VCC
VCC3	**Pin 25**	**Pin 26**	VCC
VCC3	**Pin 27**	**Pin 28**	DBG_LPCCLK
LPC_CLK0	**Pin 29**	**Pin 30**	GND
LPC_SERIRQ	**Pin 31**	**Pin 32**	LPC_AD3
LRESET#	**Pin 33**	**Pin 34**	LPC_AD2
LPC_LFRAME-	**Pin 35**	**Pin 36**	LPC_AD1
LPC_LDRQ	**Pin 37**	**Pin 38**	LPC_AD0
GND	**Pin 39**	**Pin 40**	DBG_LPCCLK

2-3 Maximum Voltage & Current Limit

Below is a list of maximum voltage & Current Limit specification for motherboard interface (including but not limited to slots, connectors and headers) for setup reference:

Parts		Working Voltage	Current Support
USB Ports from	***USB2 (USB 3.2 Gen.2)***	5V	1.5A
	USB1 (USB 3.2 Gen.2)	5V	1.5A
	F_USB1 (USB2.0)	5V	1.5A
JW_FP1		5V	1A
CPUFAN1		12V	1.5A
COM5		5V/12V (via **JPCOM5** setting)	0.5A
COM6		5V/12V(via **JPCOM6** setting)	0.5A
LVDS1		3.3V/5V (via **LVDSVCC1** setting)	2A
EDP1		3.3V/5V/12V (via **EDPLCD1** setting)	2A
M2M1		3.3V (via **JPM2M1** setting)	2A
M2B1		3.3V (via J**PM2B1** setting)	2A

Chapter 3
Introducing BIOS

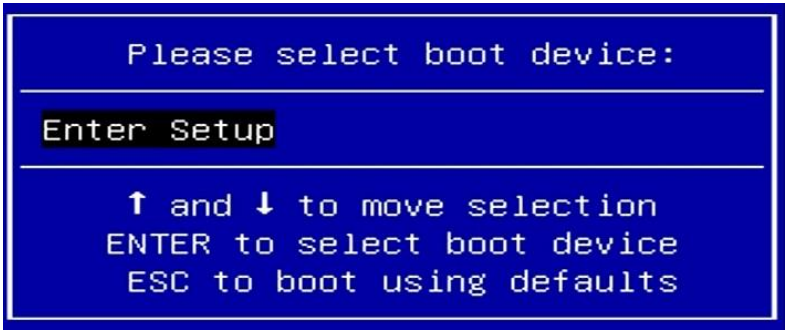
Notice!	The BIOS options in this manual are for reference only. Different configurations may lead to difference in BIOS screen and BIOS screens in manuals are usually the first BIOS version when the board is released and may be different from your purchased motherboard. Users are welcome to download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

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

3-1 Entering Setup

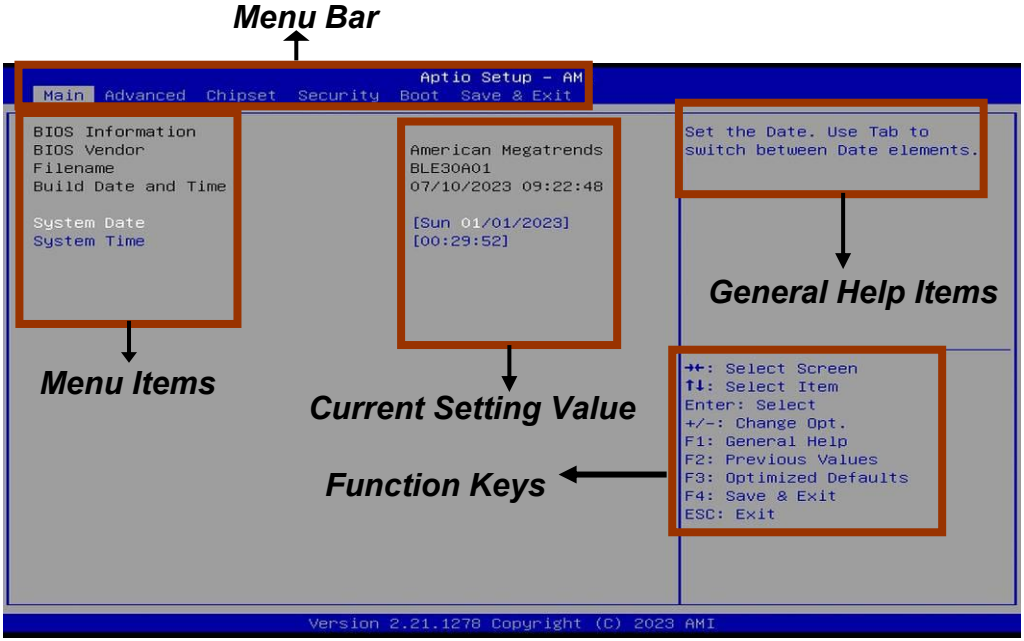
Power on the computer and by pressing <Del> immediately allows you to enter Setup. If the message disappears before your respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the “RESET” button on the system case. You may also restart by simultaneously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

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



3-2 BIOS Menu Screen

The following diagram show a general BIOS menu screen:



3-3 Function Keys

In the above BIOS Setup main menu of, you can see several options. We will explain these options step by step in the following pages of this chapter, but let us first see a short description of the function keys you may use here:

- Press←→ (left, right) to select screen;
- Press ↑↓ (up, down) to choose, in the main menu, the option you want to confirm or to modify.
- Press **<Enter>** to select.
- Press <+>/<–> keys when you want to modify the BIOS parameters for the active option.
- **[F1]:** General help.
- **[F2]:** Previous values.
- **[F3]:** Optimized defaults.
- **[F4]:** Save & Exit.
- Press **<Esc>** to exit from BIOS Setup.

3-4 Getting Help

Main Menu

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

Status Page Setup Menu/Option Page Setup Menu

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

3-5 Menu Bars

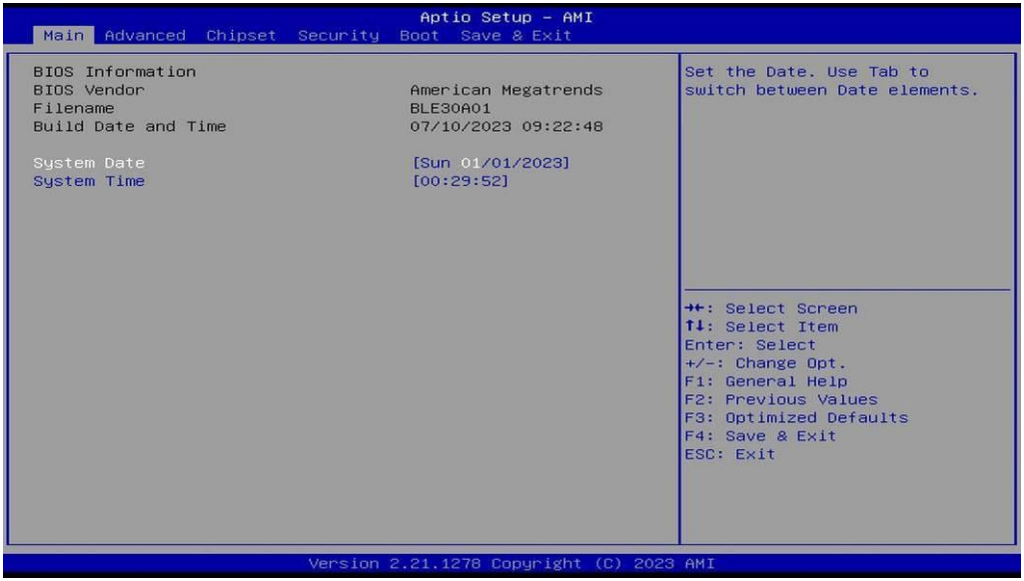
There are six menu bars on top of BIOS screen:

Main	To change system basic configuration
Advanced	To change system advanced configuration
Chipset	To change chipset configuration
Security	Password settings
Boot	To change boot settings
Save & Exit	Save setting, loading and exit options.

User can press the right or left arrow key on the keyboard to switch from menu bar. The selected one is highlighted.

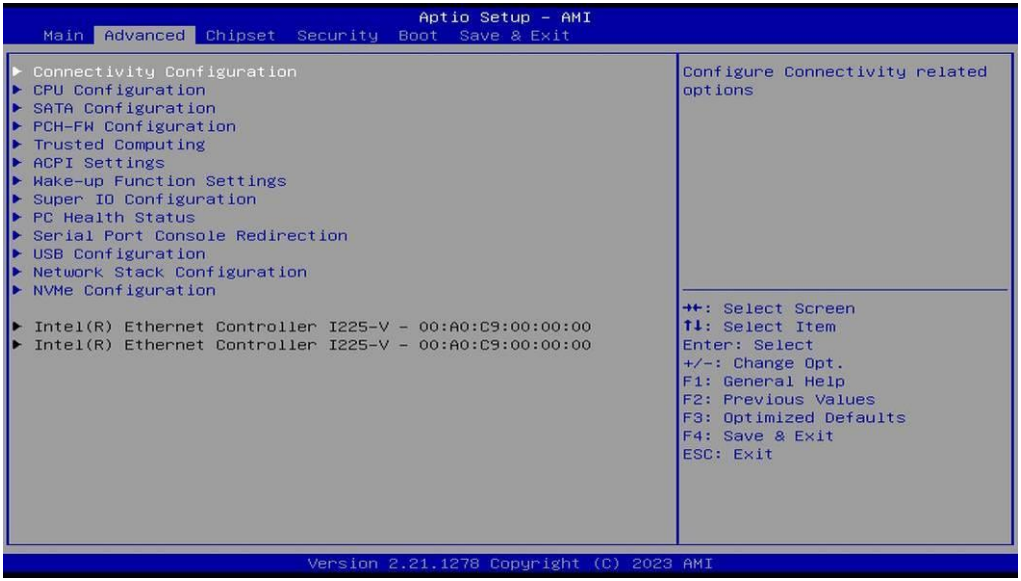
3-6 Main Menu

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



System 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



- **Connectivity Configuration**

  Use this item to configure Connectivity related options. Press [Enter] to make settings for the following sub-items:

  CNVi present

  CNVi Configuration

  CNVi Mode

  This option configures Connectivity.

  The optional settings: [Disabled Integrated]; [Auto Detection].

  [Auto Detection] means that if Discrete solution is discovered it will be enabled by default. Otherwise Integrated solution (CNVi) will be enabled;

  [Disabled Integrated] disables Integrated Solution.

- **CPU Configuration**

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

  Intel (VMX) Virtualization

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

When set as **[Enabled]**, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Intel(R) SpeedStep(tm)

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

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

C states

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

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

Hardware Prefetcher

Use this item to turn on/off the MLC streamer prefetcher.

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

Adjacent Cache Line Prefetch

Use this item to turn on/off prefetching of adjacent cache lines.

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

- **SATA Configuration**

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

SATA Configuration

SATA Controller (s)

Use this item to enable or disable SATA Device.

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

M.2

Port

Use this item to enable or disable SATA Port.

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

SATA

Port

Use this item to enable or disable SATA Port.

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

Hot Plug

Use this item to designate this port as Hot Pluggable.

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

- **PCH-FW Configuration**

  Press [Enter] to view Management Engine Technology Parameters and make settings in the following sub-item:

  ME Firmware Version

  ME Firmware Mode

  TPM Device Selection

  Use this item to select TPM Device.

  The optional settings: [dTPM]; [PTT].

  [PTT]: Enable PTT in SkuMgr; **[dTPM]**: Disable PTT in SkuMgr.

  Warning! *PTT/dTPM will be disabled and all data saved on it will be lost.*

- **Firmware Update Configuration**

  Press [Enter] to make settings for '**Me FW Image Re-Flash**'.

  Me FW Image Re-Flash

  Use this item to enable or disable Me FW Image Re-Flash function.

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

  ** **Note**: In the case that user needs to update Me firmware, user should set **'Me FW Image Re-Flash**' as [**Enabled**], save the settings and exit. The system will turn off and reboot after 4 seconds. If the user goes to BIOS screen again will find this item is set again as [**Disabled**], but user can still re-flash to update firmware next time.*

- **Trusted Computing**

  Press [Enter] to view current status information, or make further settings in 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: [Disabled]; [Enabled].

  Pending Operation

  Use this item to schedule an operation for the security device.

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

** **Note**: Your computer will reboot during restart in order to change state of security device.*

TPM 2.0 UEFI Spec Version

Use this item to select the TCG2 Spce version support.

The optional settings: [TCG_1_2]; [TCG_2].

[TCG_1_2]: Support the compatible mode for Win8/Win10; **[TCG_2]**: Support new TCG2 protocol and event format for Win10 or later.

- **ACPI Settings**

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

ACPI Settings

ACPI Sleep State

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

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

- **Wake-up Function Settings**

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

Wake-up System With Fixed Time

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

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

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

Wake-up Hour

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

Wake-up Minute

Use this item to select 0-59.

Wake-up Second

Use this item to select 0-59.

Wake-up System with Dynamic Time

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

System will wake on the current time + Increase minute(s).

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

When set as **[Enabled]**, system will wake on the current time + increased minute(s).

PS2 KB/MS Wake-up
Use this item to enable or disable PS2 KB/MS Wake-up from (S3/S4/S5).
The optional settings: [Disabled]; [Enabled].
**Note: This function is supported when 'ERP Support' is set as [Disabled].*
PCIE Wake-up from S3-S5
Use this item to enable or disable PS2 KB/MS Wake-up from (S3/S4/S5).
The optional settings: [Disabled]; [Enabled].
**Note: This function is supported when 'ERP Support' is set as [Disabled].*
USB S3/S4 Wake-up
Use this item to enable or disable USB S3/S4 wake-up.
The optional settings: [Disabled]; [Enabled].
**Note: This function is supported when 'ERP Support' is set as [Disabled].*
USB S5 Power
Use this item to enable or disable USB Power after System Shutdown.
The optional settings: [Disabled]; [Enabled].
**Note: This function is supported when 'ERP Support' is set as [Disabled].*
Internal USB Port S5 Power
Use this item to enable or disable USB Power after System Shutdown.
The optional settings: [Disabled]; [Enabled].
**Note: This function is supported when 'ERP Support' is set as [Disabled].*

- **Super IO Configuration**

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

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: [Disabled]; [Auto].

► **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).

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.
The optional settings: [IO=3F8h; IRQ=4;]; [IO=3F8h; IRQ=3,4,5,7,10,11;]; [IO=2F8h; IRQ=3,4,5,7,10,11;]; [IO=3E8h; IRQ=3,4,5,7,10,11;]; [IO=2E8h; IRQ=3,4,5,7,10,11;].

Transmission Mode Select

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

Mode Speed Select

Use this item to select RS232/RS422/RS485 Speed.
The optional settings: [RS232/RS422/RS485=250Kbps]; [RS232=1Mbps, RS422/RS485=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).
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.
The optional settings: [IO=2F8h; IRQ=3;]; [IO=3F8h; IRQ=3,4,5,7,10,11;]; [IO=2F8h; IRQ=3,4,5,7,10,11;]; [IO=3E8h; IRQ=3,4,5,7,10,11;]; [IO=2E8h; IRQ=3,4,5,7,10,11;].

Transmission Mode Select

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

Mode Speed Select

Use this item to select RS232/RS422/RS485 Speed.
The optional settings: [RS232/RS422/RS485=250Kbps]; [RS232=1Mbps, RS422/RS485=10Mbps].

► **Serial Port 3 Configuration**
Press [Enter] to make settings for the following items:
Serial Port 3 Configuration

Serial Port
Use this item to enable or disable Serial Port (COM).
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.
The optional settings: [IO=3E8h; IRQ=10;]; [IO=3F8h; IRQ=3,4,5,7,10,11;]; [IO=2F8h; IRQ=3,4,5,7,10,11;]; [IO=3E8h; IRQ=3,4,5,7,10,11;]; [IO=2E8h; IRQ=3,4,5,7,10,11;]; [IO=3E0h; IRQ=3,4,5,7,10,11;]; [IO=2E0h; IRQ=3,4,5,7,10,11;].

► **Serial Port 4 Configuration**
Press [Enter] to make settings for the following items:
Serial Port 4 Configuration

Serial Port
Use this item to enable or disable Serial Port (COM).
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.
The optional settings: [IO=2E8h; IRQ=10;]; [IO=3F8h; IRQ=3,4,5,7,10,11;]; [IO=2F8h; IRQ=3,4,5,7,10,11;]; [IO=3E8h; IRQ=3,4,5,7,10,11;]; [IO=2E8h; IRQ=3,4,5,7,10,11;]; [IO=3E0h; IRQ=3,4,5,7,10,11;]; [IO=2E0h; IRQ=3,4,5,7,10,11;].

► **Serial Port 5 Configuration**
Press [Enter] to make settings for the following items:

Serial Port 5 Configuration

Serial Port
Use this item to enable or disable Serial Port (COM).
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.
The optional settings: [IO=3E0h; IRQ=11;]; [IO=3F8h; IRQ=3,4,5,7,10,11;]; [IO=2F8h; IRQ=3,4,5,7,10,11;]; [IO=3E8h; IRQ=3,4,5,7,10,11;]; [IO=2E8h; IRQ=3,4,5,7,10,11;]; [IO=3E0h; IRQ=3,4,5,7,10,11;]; [IO=2E0h; IRQ=3,4,5,7,10,11].

► **Serial Port 6 Configuration**
Press [Enter] to make settings for the following items:
Serial Port 6 Configuration

Serial Port
Use this item to enable or disable Serial Port (COM).
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.
The optional settings: [IO=2E0h; IRQ=11;]; [IO=3F8h; IRQ=3,4,5,7,10,11;]; [IO=2F8h; IRQ=3,4,5,7,10,11;]; [IO=3E8h; IRQ=3,4,5,7,10,11;]; [IO=2E8h; IRQ=3,4,5,7,10,11;]; [IO=3E0h; IRQ=3,4,5,7,10,11;]; [IO=2E0h; IRQ=3,4,5,7,10,11;].
WatchDog Reset Timer
Use this item to enable or disable WDT reset function.
The optional settings: [Disabled]; [Enabled].
When set as **[Enabled]**, the following sub-items shall appear:
WatchDog Reset Timer Value
User can select a value in the range of [4] to [255] seconds when ‘WatchDog

Reset Timer Unit' set as [Sec]; or in the range of [4] to [255] minutes when 'WatchDog Reset Timer Unit' set as [Min].

WatchDog Reset Timer Unit

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

ATX Power Emulate AT Power

This item support Emulate AT power function, MB power ON/OFF control by power supply. Use needs to select ' AT or ATX Mode' on MB jumper at first (refer to **JATX_AT1** jumper setting Pin 1&2 of for **ATX Mode** & Pin 2&3 of **AT Mode** Select).

CASE Open Detect

Use this item to detect case has already open or not, show message in POST.

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

When set as [Enabled], system will detect if **JCASE1** has been short or not (*refer to **JCASE1** jumper setting for Case Open Detection*); if Pin 1&2 of ***JCASE1*** are short, system will show Case Open Message during POST.

PC Health Status

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

► SmartFAN Configuration

Press [Enter] to make settings for '**SmartFan Configuration**':

SmartFAN Configuration

CPUFAN Smart Mode

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

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

CPUFAN Full-Speed Temperature

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

CPUFAN Full-Speed Duty

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

CPUFAN Idle-Speed Temperature

Use this item to set CPUFAN idle speed temperature. Fan will run at idle speed

when below this pre-set temperature.

CPUFAN Idle-Speed Duty

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

- **Serial Port Console Redirection**

COM1

Console Redirection

Use this item to enable or disable COM1 Console Redirection.

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

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

[ANSI]: Extended ASCII char set;

[VT100]: ASCII char set;

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

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

Bits per second

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

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

Data Bits

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

Parity

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

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

Recorder Mode

With this mode enable only text will be sent. This is to capture Terminal data.
The optional settings: [Disabled]; [Enabled].

Resolution 100x31

Use this item to enable or disable extended terminal resolution.
The optional settings: [Disabled]; [Enabled].

Putty KeyPad

Use this item to select FunctionKey and KeyPad on Putty.
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.
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

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 then [VT100]. See above, in Console Redirection Settings page, for more help with Terminal Type/Emulation.

Bits per second EMS

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

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

Flow Control EMS

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

The optional settings: [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.*

- **USB Configuration**

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

USB Configuration

XHCI Hand-off

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

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

USB Mass Storage Driver Support

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

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.

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.

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.

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.

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.

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.

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.

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.

- **NVMe Configuration**

  Press [Enter] to view current NVMe Configuration.

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

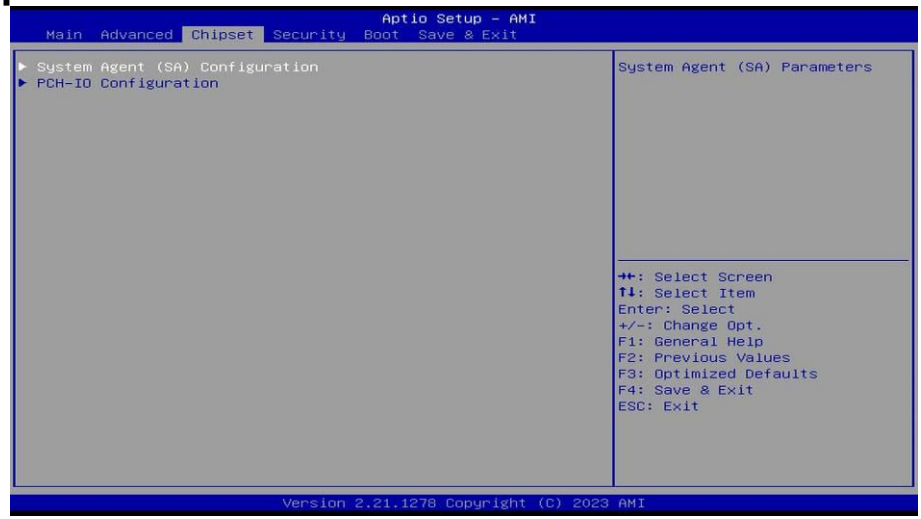
- **Intel(R) Ethernet Controller I225-V - XX:XX:XX:XX:XX:XX**

  This item shows current network brief information.

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

  This item shows current network brief information.

3-8 Chipset Menu



- **System Agent (SA) Configuration**

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

  System Agent (SA) Configuration

  VT-d

  ► Memory Configuration

  Press [Enter] to view brief information for the working memory module.

  ► Graphics Configuration

  Press [Enter] to make further settings for Graphics Configuration.

  Graphics Configuration

  Enable VGA

  Use this item to select the active configuration.

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

  Active LVDS

  Use this item to select the active configuration.

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

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

  Panel Type

Use this item to select panel type.
The optional settings are: [800x480; 18bit; Single]; [800x600; 18bit; Single]; [800x600; 24bit; Single]; [1024x600; 18bit; Single]; [1024x768; 18bit; Single]; [1024x768; 24bit; Single]; [1280x768; 24bit; Single]; [1280x800; 18bit; Single]; [1280x800; 24bit; Single]; [1366x768; 18bit; Single]; [1366x768; 24bit; Single]; [1440x900; 18bit; Dual]; [1440x900; 24bit; Dual]; [1280x1024; 24bit; Dual]; [1600x900; 18bit; Dual]; [1920x1080; 24bit; Dual].

Aperture Size

Use this item to select the Aperture Size.
The optional settings: [128M]; [256M]; [512M]; [1024M].

***Note:** Above 4GB MMIO BIOS assignment is automatically enabled when selecting 2048MB aperture. To use this feature, please disable CSM Support.*

DVMT Pre-Allocated

Use this item to select DVMT5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.
The optional settings: [0M]; [32M]; [64M]; [96M]; [128M]; [160M].

DVMT Total Gfx Mem

Use this item to select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device.
The optional settings: [128M]; [256M]; [MAX].

► **VMD setup menu**

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

VMD Configuration

Enable VMD controller

Use this item to enable/disable to VMD controller.
The optional settings: [Enable]; [Disable].
When set as **[Enabled]**, the following sub-items shall appear:

Map this Root Port under VMD

Use this item to Map/UnMap this Root Port to VMD.
The optional settings: [Enable]; [Disable].

Root Port BDF details

PCH-IO Configuration

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

PCH-IO Configuration

USB Controller

Use this item to enable or disable USB Physical Connector (physical port). Once **[Disabled]**, any USB devices plug into the connector will not be detected by BIOS or OS.

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

HD Audio

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

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

[**Disabled**]: HDA will be unconditionally disabled.

[**Enabled**]: HAD will be unconditionally 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 (G3 state).

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

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

Onboard Lan1 Controller

Use this item to control the PCI Express Root Port.

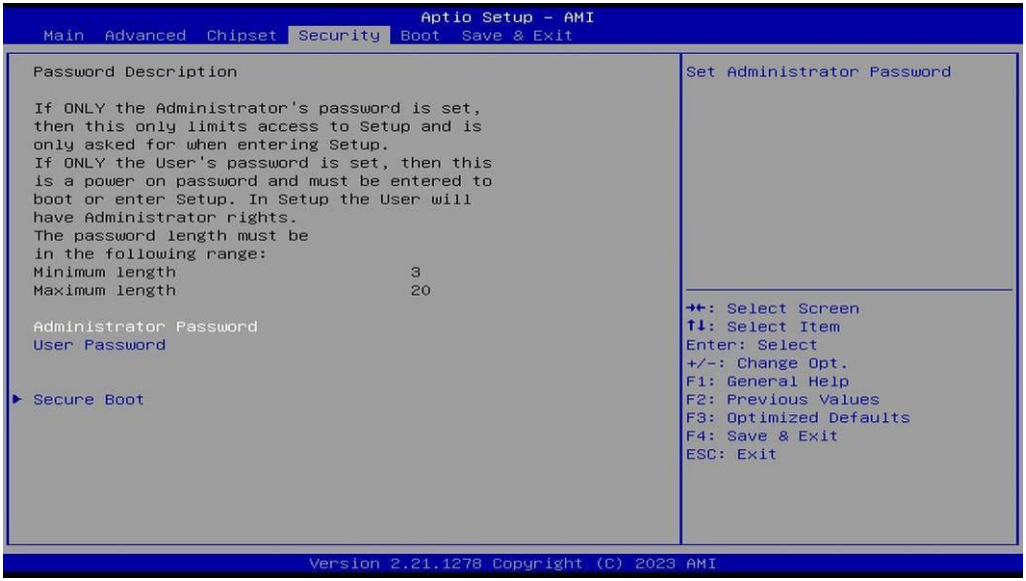
The optional settings: [Disabled]; [Enabled].

Onboard Lan2 Controller

Use this item to enable or disable onboard PCI Express Root Port.

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

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 are: [Disabled]; [Enabled].

Secure Boot Mode

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

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

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

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

Restore Factory Keys

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

Reset to Setup Mode

Press [Enter] to delete all Secure Boot key databases from NVRAM.

Key Management

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

Vendor Keys

Factory Key Provision

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

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

Restore Factory Keys

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

Reset To Setup Mode

Press [Enter] to delete all Secure Boot key databases from NVRAM.

Export Secure Boot Variables

Press [Enter] 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

Device Guard ready system must not list 'Microsoft UEFI CA' Certificate in Authorized Signature database (dp).

Restore DB default

This item restore DB variable to factory defaults.

Secure Boot variable/Size/Keys/Key Source

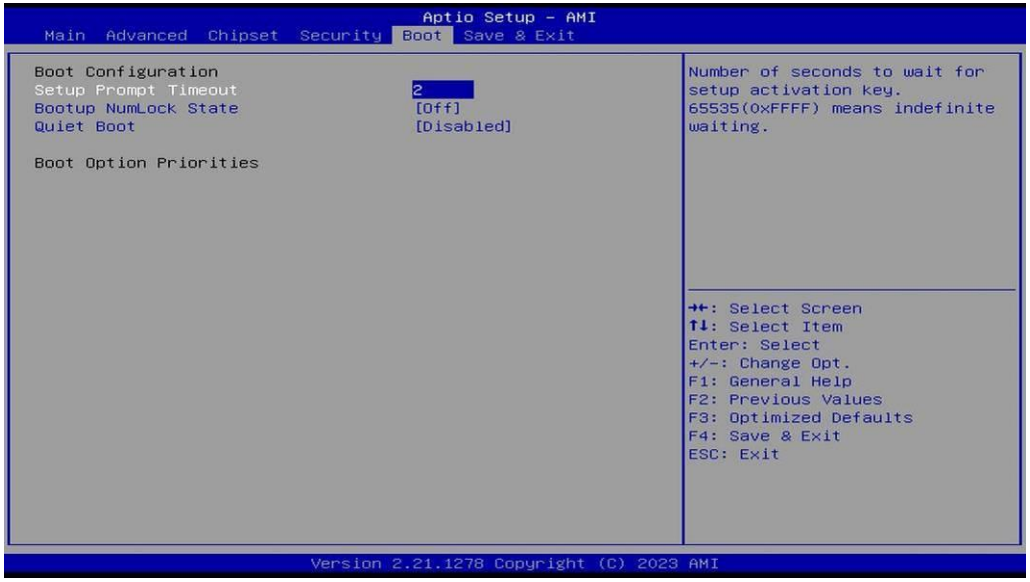
Platform Key(PK)/Key Exchange Keys/Authorized Signatures/Forbidden Signatures/ Authorized TimeStamps/OsRecovery Signatures

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

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

Key Source: Factory, External, Mixed.

3-10 Boot Menu



Boot Configuration

Setup Prompt Timeout

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

Bootup NumLock State

Use this item to select keyboard NumLock state.

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

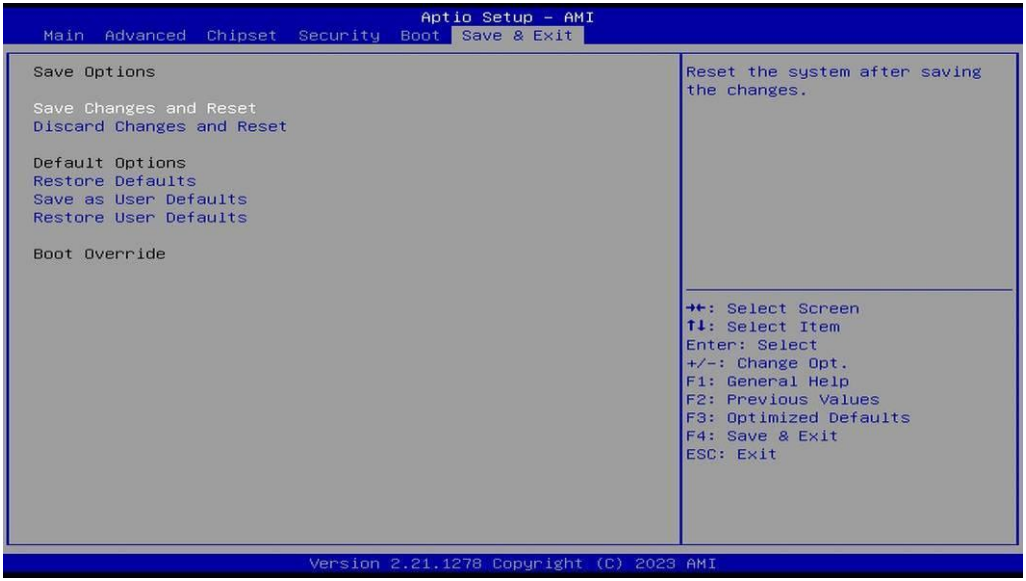
Quiet Boot

Use this item to enable or disable Quite Boot option.

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

Boot Option Priorities

3-11 Save & Exit Menu



Save Options:

Save Changes and Reset

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

Discard Changes and Reset

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

Default Options:

Restore Defaults

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

Save as User Defaults

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

Restore User Defaults

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

Boot Override