



SBC-230-WT

SBC-230D

SBC-230L

User Manual

Version 1.0

Published May 2017

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Published May 2017

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# Chapter 1: Introduction

Thank you for purchasing ASRock **SBC-230-WT / SBC-230D / SBC-230L** motherboard, a reliable motherboard produced under ASRock's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRock's commitment to quality and endurance.

In this manual, chapter 1 and 2 contain introduction of the motherboard and step-by-step guide to the hardware installation. Chapter 3 and 4 contain the configuration guide to BIOS setup and information of the Support CD.



Because the motherboard specifications and the BIOS software might be updated, the content of this manual will be subject to change without notice. In case any modifications of this manual occur, the updated version will be available on ASRock website without further notice. You may find the latest VGA cards and CPU support lists on ASRock website as well. ASRock website <http://www.asrock.com>

If you require technical support related to this motherboard, please visit our website for specific information about the model you are using.

[www.asrock.com/support/index.asp](http://www.asrock.com/support/index.asp)

## 1.1 Package Contents

ASRock **SBC-230-WT / SBC-230D / SBC-230L** Motherboard

(3.5" SBC (5.8-in x 4.0-in) / (146 x 102 mm))

ASRock **SBC-230-WT / SBC-230D / SBC-230L** Driver CD

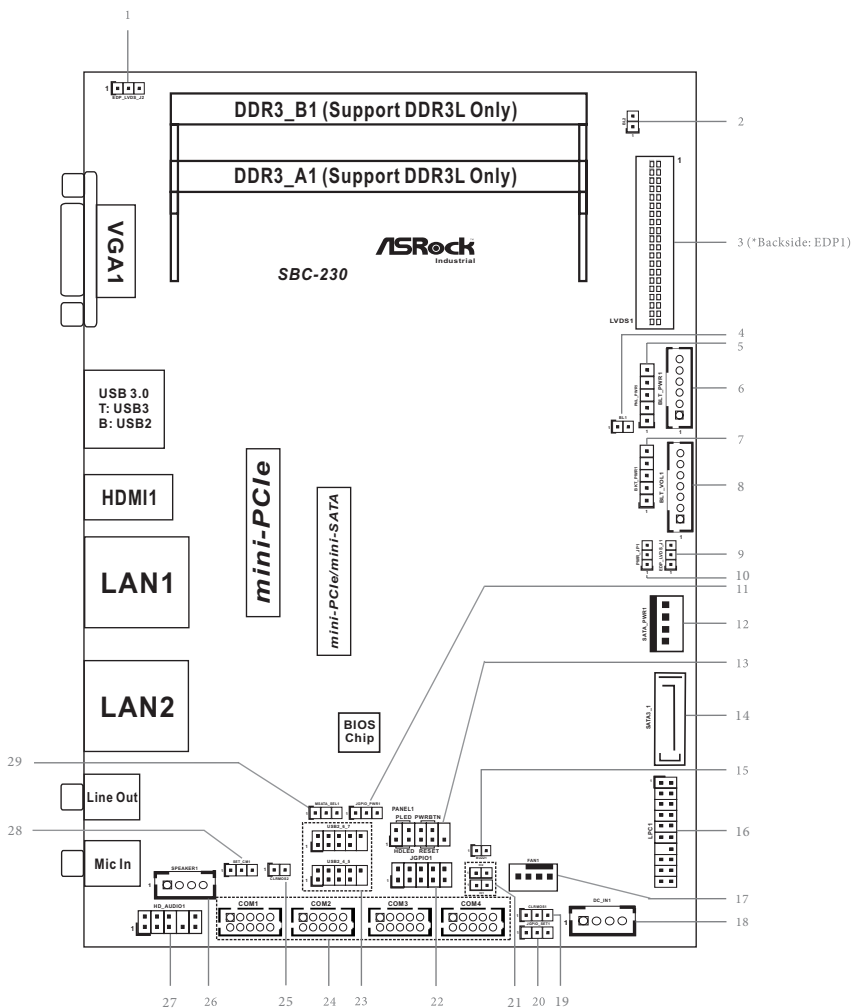
ASRock **SBC-230-WT / SBC-230D / SBC-230L** Jumper Setting Instruction

## 1.2 Specifications

<b>Form Factor</b>	Dimensions	3.5" SBC (5.8-in x 4.0-in) / (146 x 102 mm)
<b>Processor System</b>	CPU	BGA1296 for Intel® Apollo Lake SoC
	Core Number	(By CPU, Max 4)
	Max Speed	(By CPU)
	L2 Cache	(By CPU)
	Chipset	N/A
	BIOS	UEFI
<b>Expansion Slot</b>	PCIe	0
	Mini-PCIe	1 x mini-PCIe (half/full size, PCIe1 + USB), 1 x mini-PCIe (full size, shared with mSATA + USB)
	mSATA	1
	M.2	0
<b>Memory</b>	Technology	Dual Channel DDR3L 1867MHz
	Max.	16GB
	Socket	2 x SO-DIMM
<b>Graphics</b>	Controller	Intel® Gen9 Graphics 4K Codec Decode & Encode
	VRAM	Shared Memory
	VGA	Supports Max resolution up to 1920 x 1200
	DVI	No
	LVDS	Supports Max resolution up to 1920 x 1200@60Hz
	HDMI	Supports HDMI, Max resolution up to 4096 x 2160@24Hz
	DisplayPort	No
Multi Display	Yes (Triple Display)	
<b>Ethernet</b>	Interface	10/100/1000 Mbps
	Controller	2 x Intel® i210
	Connector	2 x RJ45
<b>SATA</b>	Max Data Transfer Rate	SATA3 (6.0Gb/s)

<b>Rear I/O</b>	VGA	1
	DVI	0
	HDMI	1
	DisplayPort	0
	Ethernet	2
	USB	2 (USB 3.0)
	Audio	2 (Mic-in, Line-out)
	Serial	0
	PS/2	0
<b>Internal Connector</b>	USB	4 x USB 2.0 (2 x 2.54 pitch header)
	LVDS/ Inverter	1/1
	eDP	1
	VGA	1
	Serial	4 x COM (COM1 supports RS-232/422/485)
	SATA	1
	mPCIe	2
	Parallel	0
	mSATA	1 (shared with mini-PCIe)
	IrDA	0
	GPIO 8-bit	4 x GPI + 4 x GPO
	SATA PWR Output Con	1
	Speaker Header	1
<b>Watchdog Timer</b>	Output	Output from super I/O to drag RESETCON#
	Interval	256 Segments, 0,1,2...255 Sec/Min
<b>Power Requirements</b>	Input PWR	9V~36V DC-in (4-pin PWR Con)
	Power On	AT/ATX Supported AT: Directly PWR on as power input ready ATX: Press button to PWR on after power input ready
<b>Environment</b>	Temperature	0°C – 60°C

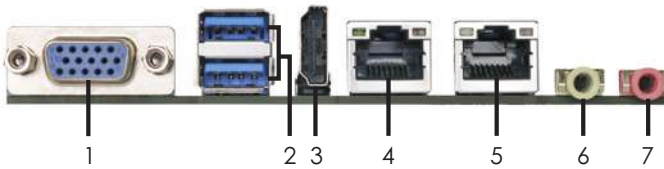
### 1.3 Motherboard Layout





- 
- 1 : EDP\_LVDS\_J2
  - 2 : BL2
  - 3 : LVDS Panel Connector
    - \* eDP Connector (on the Backside of PCB)
  - 4 : BL1
  - 5 : Panel Power Selection (LCD\_VCC) (PNL\_PWR1)
  - 6 : Inverter Power Control Wafer (BLT\_PWR1)
  - 7 : Backlight Power Select (LCD\_BLT\_VCC) (BKT\_PWR1)
  - 8 : Backlight & Amp Volume Control (BLT\_VOL1)
  - 9 : EDP\_LVDS\_J1
  - 10 : ATX/AT Mode Select (PWR\_JP1)
  - 11 : Digital Input / Output Power Select (JGPIO\_PWR1)
  - 12 : SATA Power Output Connector
  - 13 : System Panel Header
  - 14 : SATA3 Connector (SATA3\_1)
  - 15 : 2-Pin Buzzer Header
  - 16 : LPC Header
  - 17 : 4-Pin FAN Connector (+12V)
  - 18 : ATX Power Connector (Input 9V~36V)
  - 19 : Clear CMOS Header (CLRMOS1)
  - 20 : GPIO Default Setting (JGPIO\_SET1)
  - 21 : Chassis Intrusion Headers (CI1, CI2)
  - 22 : Digital Input / Output Pin Header (JGPIO1)
  - 23 : USB2.0 Connectors (USB2\_4\_5, USB2\_6\_7)
  - 24 : COM1, 2, 3, 4 Headers
  - 25 : Clear CMOS Header (CLRMOS2)
  - 26 : 3W Audio AMP Output Wafer
  - 27 : Front Panel Audio Header
  - 28 : COM1 Pin9 PWR Setting Jumper (SET\_CM1)
  - 29 : mSATA Select (MSATA\_SEL1)

## 1.4 I/O Panel



- |   |                          |   |                        |
|---|--------------------------|---|------------------------|
| 1 | D-Sub Port (VGA1)        | 5 | LAN RJ-45 Port (LAN2)* |
| 2 | USB 3.0 Ports (USB3_2_3) | 6 | Line Out (Green)       |
| 3 | HDMI Port (HDMI1)        | 7 | Microphone (Pink)      |
| 4 | LAN RJ-45 Port (LAN1)*   |   |                        |

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

### LAN Port LED Indications

#### Activity/Link LED

Status	Description
Off	No Link
Blinking	Data Activity
On	Link

#### SPEED LED

Status	Description
Off	10Mbps connection
Off	100Mbps connection
Green	1Gbps connection

ACT/LINK LED    SPEED LED



LAN Port

---

## Chapter 2: Installation

This is a 3.5" SBC (5.8-in x 4.0-in) form factor (146 x 102 mm) motherboard. Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.



Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so may cause physical injuries to you and damages to motherboard components.

### 2.1 Screw Holes

Place screws into the holes to secure the motherboard to the chassis.



Do not over-tighten the screws! Doing so may damage the motherboard.

### 2.2 Pre-installation Precautions

Take note of the following precautions before you install motherboard components or change any motherboard settings.

1. Unplug the power cord from the wall socket before touching any component.
2. To avoid damaging the motherboard components due to static electricity, NEVER place your motherboard directly on the carpet or the like. Also remember to use a grounded wrist strap or touch a safety grounded object before you handle components.
3. Hold components by the edges and do not touch the ICs.
4. Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that comes with the component.



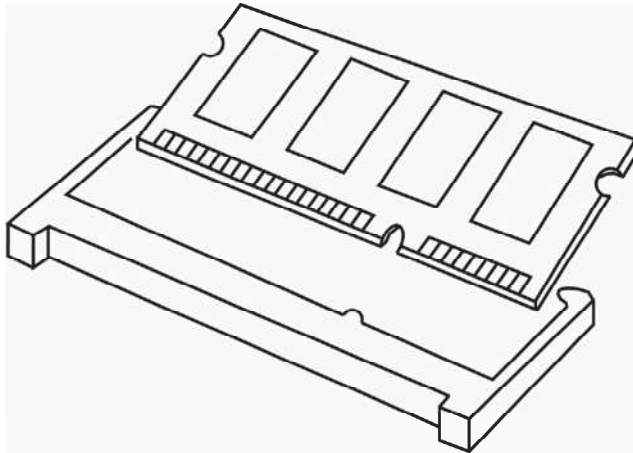
Before you install or remove any component, ensure that the power is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

---

## 2.3 Installation of Memory Modules (SO-DIMM)

**SBC-230-WT / SBC-230D / SBC-230L** provides two 204-pin DDR3 (Double Data Rate 3) SO-DIMM slots.

- Step 1. Align a SO-DIMM on the slot such that the notch on the SO-DIMM matches the break on the slot.



The SO-DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the SO-DIMM if you force the SO-DIMM into the slot at incorrect orientation.

- Step 2. Firmly insert the SO-DIMM into the slot until the retaining clips at both ends fully snap back in place and the SO-DIMM is properly seated.

---

## 2.4 Expansion Slots (mini-PCIe and mini-PCIe/mini-SATA Slots)

There is 1 mini-PCIe slot and 1 mini-PCIe/mini-SATA slot on this motherboard.

### mini-PCIe slot:

MINI\_PCIE1 (mini-PCIe slot; full size) is used for PCI Express mini cards.

### mini-PCIe/mini-SATA slot:

MINI\_SATA1 (mini-PCIe/mini-SATA slot; full size) is used for PCI Express mini cards or mSATA cards.

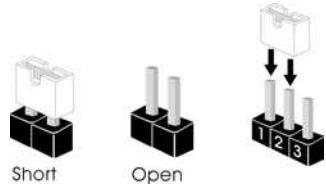
## Installing an expansion card

- Step 1. Before installing the expansion card, please make sure that the power supply is switched off or the power cord is unplugged. Please read the documentation of the expansion card and make necessary hardware settings for the card before you start the installation.
- Step 2. Remove the system unit cover (if your motherboard is already installed in a chassis).
- Step 3. Remove the bracket facing the slot that you intend to use. Keep the screws for later use.
- Step 4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.
- Step 5. Fasten the card to the chassis with screws.
- Step 6. Replace the system cover.

---

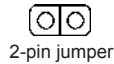
## 2.5 Jumpers Setup

The illustration shows how jumpers are setup. When the jumper cap is placed on pins, the jumper is “Short”. If no jumper cap is placed on pins, the jumper is “Open”. The illustration shows a 3-pin jumper whose pin1 and pin2 are “Short” when jumper cap is placed on these 2 pins.



---

Clear CMOS Jumper  
(2-pin CLRMOS2)  
(see p.8, No. 25)

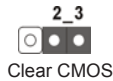


Open: Normal  
Short: Auto Clear CMOS When AC  
Power On

Note: CLRMOS2 allows you to clear the data in CMOS. The data in CMOS includes system setup information such as system password, date, time, and system setup parameters. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord, then use a jumper cap to short the pins on CLRMOS2 for 3 seconds. Please remember to remove the jumper cap after clearing the CMOS. If you need to clear the CMOS when you just finish updating the BIOS, you must boot up the system first, and then shut it down before you do the clear-CMOS action.

---

Clear CMOS Jumper  
(CLRMOS1)  
(see p.8, No. 19)



Note: CLRMOS1 allows you to clear the data in CMOS. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord from the power supply. After waiting for 15 seconds, use a jumper cap to short pin2 and pin3 on CLRMOS1 for 5 seconds. However, please do not clear the CMOS right after you update the BIOS. If you need to clear the CMOS when you just finish updating the BIOS, you must boot up the system first, and then shut it down before you do the clear-CMOS action. Please be noted that the password, date, time, user default profile and MAC address will be cleared only if the CMOS battery is removed.

---

Digital Input/Output Power Select  
(3-pin JGPIO\_PWR1)  
(see p.8 No. 11)



1-2: +12V  
2-3: +5V

---

**ATX/AT Mode Select**

(3-pin PWR\_JP1)

(see p.8 No. 10)



1-2: AT Mode

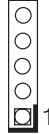
2-3: ATX Mode

---

**Panel Power Select (LCD\_VCC)**

(5-pin PNL\_PWR1)

(see p.8 No. 5)



Use this to set up the VDD power of the LVDS connector.

1-2: +3V

2-3: +5V

3-4: +5V

4-5: +12V

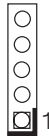
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**Backlight Power Select**

(LCD\_BLT\_VCC)

(5-pin BKT\_PWR1)

(see p.8 No. 7)



Use this to set up the backlight power of the LVDS connector.

1-2: +5V

2-3: +12V

3-4: +12V

4-5: DC\_IN Power

---

**COM1 Pin9 PWR Setting Jumpers**

(3-pin SET\_COM1)

(see p.8 No. 28)



1-2: +5V

2-3: +12V

---

**GPIO Default Setting**

(3-pin JGPIO\_SET1)

(see p.8 No. 20)



1-2: Pull-High

2-3: Pull-Low

---

**EDP\_LVDS\_J2**

(3-pin EDP\_LVDS\_J2)

(see p.8 No. 1)



1-2: eDP

2-3: LVDS

---

**EDP\_LVDS\_J1**

(3-pin EDP\_LVDS\_J1)

(see p.8 No. 9)



1-2: eDP

2-3: LVDS

---

**mSATA Select**

(3-pin MSATA\_SEL1)

(see p.8 No. 29)



1-2: Auto Detect or Auto Select

2-3: Fixed Mini-SATA

---

## 2.6 Onboard Headers and Connectors



Onboard headers and connectors are NOT jumpers. Do NOT place jumper caps over these headers and connectors. Placing jumper caps over the headers and connectors will cause permanent damage of the motherboard!

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### SATA3 Connector

(SATA3\_1: see p.8, No. 14)



SATA3\_1

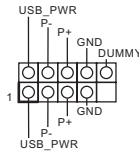
This Serial ATA3 (SATA3) connector supports SATA data cables for internal storage devices. The current SATA3 interface allows up to 6.0 Gb/s data transfer rate.

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### USB 2.0 Headers

(9-pin USB2\_4\_5, USB2\_6\_7)

(see p.8 No. 23)



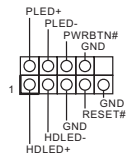
There are two USB 2.0 headers on this motherboard.

---

### System Panel Header

(9-pin PANEL1)

(see p.8 No. 13)



This header accommodates several system front panel functions.



Connect the power switch, reset switch and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.

**PWRBTN (Power Switch):**

Connect to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch.

**RESET (Reset Switch):**

Connect to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.

**PLED (System Power LED):**

Connect to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED keeps blinking when the system is in S1 sleep state. The LED is off when the system is in S3/S4 sleep state or powered off (S5).



### HDLED (Hard Drive Activity LED):

Connect to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data.

The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.

### 3W Audio AMP Output Wafer

(4-pin SPEAKER1)

(see p.8 No. 26)

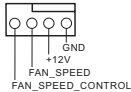


PIN	Signal Name	PIN	Signal Name	PIN	Signal Name	PIN	Signal Name
1	SPK L-	2	SPK L+	3	SPK R+	4	SPK R-

### Fan Connector

(4-pin FAN1)

(see p.8 No. 17)



Please connect the fan cable to the fan connector and match the black wire to the ground pin.

### ATX Power Connector (Input 9V~36V)

(4-pin ATX12V1)

(see p.8 No. 18)



Please connect a DC power supply (9V~36V) to this connector.

1-4 : GND

2-3 : DC Input

### SATA Power Output Connector

(4-pin SATA\_PWR1)

(see p.8 No. 12)



### Inverter Power Control Wafer

(6-pin BLT\_PWR1)

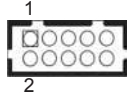
(see p.8 No. 6)



PIN	Signal Name
6	LCD_BLT_VCC
5	LCD_BLT_VCC
4	CON_LBKLT_EN
3	CON_LBKLT_CTL
2	GND
1	GND

## COM Port Headers

(10-pin COM1~4)  
(see p.8 No. 24)



PIN	Signal Name	PIN	Signal Name	PIN	Signal Name	PIN	Signal Name	PIN	Signal Name
1	DDCD#	3	TTXD	5	GND	7	RRTS#	9	COM_PWR
2	RRXD	4	DDTR#	6	DDSR#	8	CCTS#	10	DUMMY



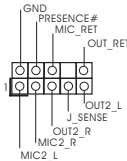
This motherboard supports RS232/422/485 on COM1 port. Please refer to below table for the pin definition. In addition, COM1 port (RS232/422/485) can be adjusted in BIOS setup utility > Advanced Screen > Super IO Configuration. You may refer to page 28 for details.

### COM1 Port Pin Definition

PIN	RS232	RS422	RS485
1	DCD	TX-	RTX-
2	RXD	RX+	N/A
3	TXD	TX+	RTX+
4	DTR	RX-	N/A
5	GND	GND	GND
6	DSR	N/A	N/A
7	RTS	N/A	N/A
8	CTS	N/A	N/A
9	NA/+5V/+12V	N/A	N/A

## Front Panel Audio Header

(9-pin HD\_AUDIO1)  
(see p.8 No. 27)



This is an interface for front panel audio cable that allows convenient connection and control of audio devices.

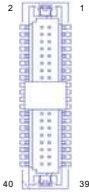


- High Definition Audio supports Jack Sensing, but the panel wire on the chassis must support HDA to function correctly. Please follow the instruction in our manual and chassis manual to install your system.
- If you use AC'97 audio panel, please install it to the front panel audio header as below:
  - Connect Mic\_IN (MIC) to MIC2\_L.
  - Connect Audio\_R (RIN) to OUT2\_R and Audio\_L (LIN) to OUT2\_L.
  - Connect Ground (GND) to Ground (GND).
  - MIC\_RET and OUT\_RET are for HD audio panel only. You don't need to connect them for AC'97 audio panel.
  - To activate the front mic.  
Go to the "FrontMic" Tab in the Realtek Control panel. Adjust "Recording Volume".

## LVDS Connector

(40-pin LVDS1)

(see p.8 No. 3)



PIN	Signal Name	PIN	Signal Name
2	LCD_VCC	1	LCD_VCC
4	LDDC_CLK	3	+3.3V
6	LVDS_A_DATA0#	5	LDDC_DATA
8	GND	7	LVDS_A_DATA0
10	LVDS_A_DATA1#	9	LVDS_A_DATA1#
12	LVDS_A_DATA2#	11	GND
14	GND	13	LVDS_A_DATA2
16	LVDS_A_DATA3#	15	LVDS_A_DATA3#
18	LVDS_A_CLK#	17	GND
20	GND	19	LVDS_A_CLK
22	LVDS_B_DATA0	21	LVDS_B_DATA0#
24	LVDS_B_DATA1#	23	GND
26	GND	25	LVDS_B_DATA1
28	LVDS_B_DATA2	27	LVDS_B_DATA2#
30	LVDS_B_DATA3#	29	DPLVDD_EN
32	GND	31	LVDS_B_DATA3
34	LVDS_B_CLK	33	LVDS_B_CLK#
36	CON_LBKLT_EN	35	GND
38	LCD_BLT_VCC	37	CON_LBKLT_CTL
40	LCD_BLT_VCC	39	LCD_BLT_VCC

\* eDP Connector (on the Backside of PCB)

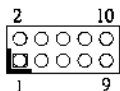


PIN	Signal Name
40	NA
39	LCD_BLT_VCC
38	LCD_BLT_VCC
37	LCD_BLT_VCC
36	LCD_BLT_VCC
35	NA
34	NA
33	CON_LBKLT_CTL
32	CON_LBKLT_EN
31	GND
30	GND
29	GND
28	GND
27	eDP_HPD_CON
26	GND
25	GND
24	GND
23	GND
22	NA
21	LCD_VCC
20	LCD_VCC
19	LCD_VCC
18	LCD_VCC
17	GND
16	eDP_AUX#_CON
15	eDP_AUX_CON
14	GND
13	eDP_TX0_CON
12	eDP_TX#0_CON
11	GND
10	eDP_TX1_CON
9	eDP_TX#1_CON
8	GND
7	eDP_TX2_CON
6	eDP_TX#2_CON
5	GND
4	eDP_TX3_CON
3	eDP_TX#3_CON
2	GND
1	NA

## Digital Input/Output Pin Header

(10-pin JGPIO1)

(see p.8 No. 22)



PIN	Signal Name	PIN	Signal Name	PIN	Signal Name	PIN	Signal Name	PIN	Signal Name
2	SIO_GP30	4	SIO_GP31	6	SIO_GP32	8	SIO_GP33	10	GND
1	SIO_GP34	3	SIO_GP35	5	SIO_GP36	7	SIO_GP37	9	JGPIO_PWR

## Backlight & Amp Volume Control

(7-pin BLT\_VOL1)

(see p.8 No. 8)

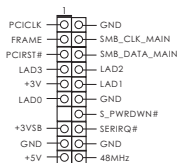


PIN	Signal Name
7	GND
6	GND
5	GPIO_BLT_DW
4	GPIO_BLT_UP
3	PWRDN
2	GPIO_VOL_DW
1	GPIO_VOL_UP

## LPC Header

(19-pin LPC1)

(see p.8 No. 16)



This connector supports Trusted Platform Module (TPM) system, which can securely store keys, digital certificates, passwords, and data. A TPM system also helps enhance network security, protects digital identities, and ensures platform integrity.

## BL1, BL2

(2-pin BL1)

(see p.8 No. 4)

(2-pin BL2)

(see p.8 No. 2)



## Chassis Intrusion Headers

(2-pin CI1, CI2)

(see p.8 No. 21)



This motherboard supports CASE OPEN detection feature that detects if the chassis cover has been removed. This feature requires a chassis with chassis intrusion detection design.

## Buzzer Header

(2-pin BUZZ1)

(see p.8 No. 15)



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## Chapter 3: UEFI SETUP UTILITY

### 3.1 Introduction

This section explains how to use the UEFI SETUP UTILITY to configure your system. The UEFI chip on the motherboard stores the UEFI SETUP UTILITY. You may run the UEFI SETUP UTILITY when you start up the computer. Please press <F2> or <Del> during the Power-On-Self-Test (POST) to enter the UEFI SETUP UTILITY, otherwise, POST will continue with its test routines.

If you wish to enter the UEFI SETUP UTILITY after POST, restart the system by pressing <Ctl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You may also restart by turning the system off and then back on.



Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen.

#### 3.1.1 UEFI Menu Bar

The top of the screen has a menu bar with the following selections:

- Main**                    To set up the system time/date information
- Advanced**              To set up the advanced UEFI features
- H/W Monitor**          To display current hardware status
- Security**                To set up the security features
- Boot**                    To set up the default system device to locate and load the Operating System
- Exit**                     To exit the current screen or the UEFI SETUP UTILITY

Use < ← > key or < → > key to choose among the selections on the menu bar, and then press <Enter> to get into the sub screen. You can also use the mouse to click your required item.

---

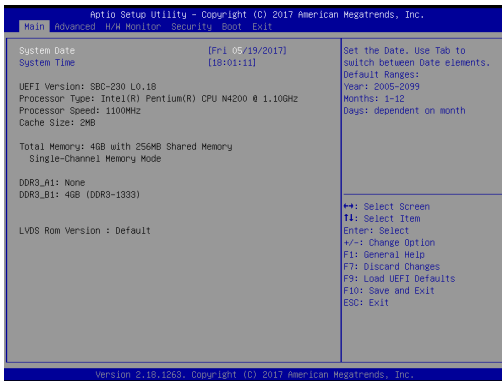
### 3.1.2 Navigation Keys

Please check the following table for the function description of each navigation key.

Navigation Key(s)	Function Description
← / →	Moves cursor left or right to select Screens
↑ / ↓	Moves cursor up or down to select items
+ / -	To change option for the selected items
<Enter>	To bring up the selected screen
<F1>	To display the General Help Screen
<F7>	Discard changes
<F9>	To load optimal default values for all the settings
<F10>	To save changes and exit the UEFI SETUP UTILITY
<F12>	Print screen
<ESC>	To jump to the Exit Screen or exit the current screen

### 3.2 Main Screen

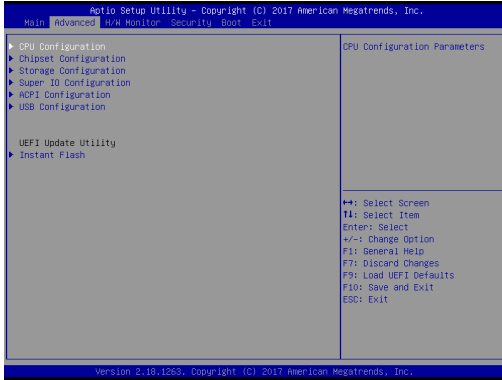
When you enter the UEFI SETUP UTILITY, the Main screen will appear and display the system overview.



---

### 3.3 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, Chipset Configuration, Storage Configuration, Super IO Configuration, ACPI Configuration and USB Configuration.



Setting wrong values in this section may cause the system to malfunction.

#### Instant Flash

Instant Flash is a UEFI flash utility embedded in Flash ROM. This convenient UEFI update tool allows you to update system UEFI without entering operating systems first like MS-DOS or Windows®. Just launch this tool and save the new UEFI file to your USB flash drive, floppy disk or hard drive, then you can update your UEFI only in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system. If you execute Instant Flash utility, the utility will show the UEFI files and their respective information. Select the proper UEFI file to update your UEFI, and reboot your system after UEFI update process completes.

---

## 3.3.1 CPU Configuration



### Intel SpeedStep Technology

Intel SpeedStep technology is Intel's new power saving technology. Processors can switch between multiple frequencies and voltage points to enable power saving. The default value is [Enabled]. Configuration options: [Enabled] and [Disabled]. If you install Windows® OS and want to enable this function, please set this item to [Enabled]. This item will be hidden if the current CPU does not support Intel SpeedStep technology.



Please note that enabling this function may reduce CPU voltage and lead to system stability or compatibility issues with some power supplies. Please set this item to [Disabled] if above issues occur.

### CPU C States Support

Enable CPU C States Support for power saving. It is recommended to keep C3, C6 and C7 all enabled for better power saving.

### Enhanced Halt State (C1E)

Enable Enhanced Halt State (C1E) for lower power consumption.

### Intel Virtualization Technology

When this option is set to [Enabled], a VMM (Virtual Machine Architecture) can utilize the additional hardware capabilities provided by Vanderpool Technology. This option will be hidden if the installed CPU does not support Intel Virtualization Technology.

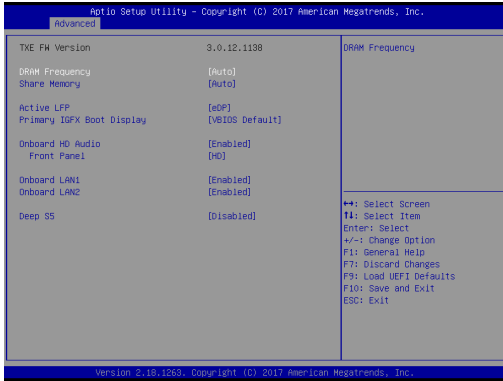
### VT-d

Intel® Virtualization Technology for Directed I/O helps your virtual machine monitor better utilize hardware by improving application compatibility and reliability, and providing additional levels of manageability, security, isolation, and I/O performance.



---

## 3.3.2 Chipset Configuration



### DRAM Frequency

If [Auto] is selected, the motherboard will detect the memory module(s) inserted and assign the appropriate frequency automatically.

### Share Memory

Configure the size of memory that is allocated to the integrated graphics processor when the system boots up.

### Active LFP

Select [eDP] or [LVDS]. The default value is [eDP].

### Primary IGFX Boot Display

Use this to select primary internal graphics boot display. The default value is [VBIOS Default].

### Onboard HD Audio

Select [Auto], [Enabled] or [Disabled] for the onboard HD Audio feature. If you select [Auto], the onboard HD Audio will be disabled when PCI Sound Card is plugged.

### Front Panel

Select [HD] or [AC 97] for the onboard HD Audio Front Panel.

### Onboard LAN 1

This allows you to enable or disable the Onboard LAN 1 feature.

### Onboard LAN 2

This allows you to enable or disable the Onboard LAN 2 feature.

---

### **Deep S5**

Mobile platforms support Deep S5 in DC only and desktop platforms support Deep S5 in AC only. The default value is [Disabled].

---

### 3.3.3 Storage Configuration



#### SATA Controller(s)

Use this item to enable or disable the SATA Controller feature.

#### SATA Mode Selection

Use this to select SATA mode. Configuration options: [IDE Mode] and [AHCI Mode]. The default value is [AHCI Mode].



AHCI (Advanced Host Controller Interface) supports NCQ and other new features that will improve SATA disk performance but IDE mode does not have these advantages.

#### Aggressive Link Power Management

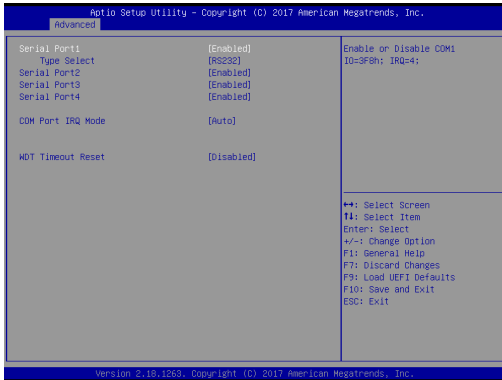
Use this item to configure Aggressive Link Power Management.

#### Hard Disk S.M.A.R.T.

Use this item to enable or disable the S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) feature. Configuration options: [Disabled] and [Enabled].

---

### 3.3.4 Super IO Configuration



#### Serial Port1

Use this to enable or disable COM1.

#### Type Select

Use this to set parameters of COM1. Select COM1 port type: [RS232], [RS422] or [RS485].

#### Serial Port2

Use this to set parameters of COM2.

#### Serial Port3

Use this to set parameters of COM3.

#### Serial Port4

Use this to set parameters of COM4.

#### COM Port IQR Mode

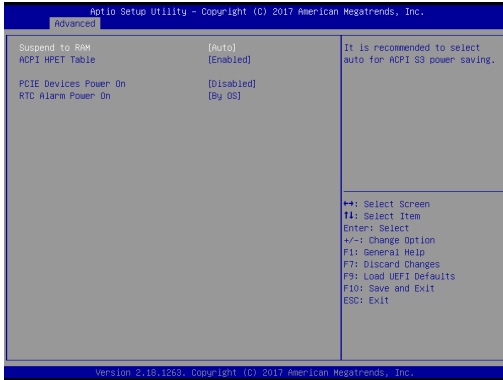
Use this set COM port IQR mode.

#### WDT Timeout Reset

This allows users to enable/disable the Watch Dog Timer timeout to reset system. The default value is [Disabled].

---

### 3.3.5 ACPI Configuration



#### **Suspend to RAM**

Use this item to select whether to auto-detect or disable the Suspend-to-RAM feature. Select [Auto] will enable this feature if the OS supports it.

#### **ACPI HPET Table**

Use this item to enable or disable ACPI HPET Table. The default value is [Enabled]. Please set this option to [Enabled] if you plan to use this motherboard to submit Windows® certification.

#### **PCIE Devices Power On**

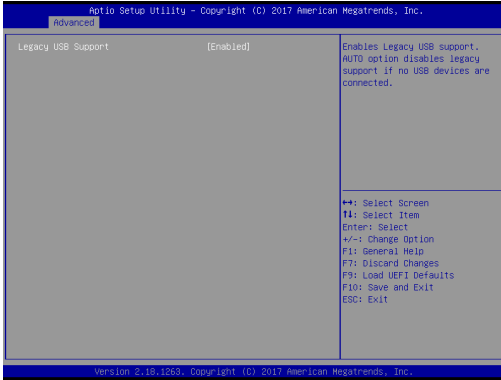
Allow the system to be waked up by a PCIE device and enable wake on LAN.

#### **RTC Alarm Power On**

Use this item to enable or disable RTC (Real Time Clock) to power on the system.

---

### 3.3.6 USB Configuration



#### Legacy USB Support

Use this option to select legacy support for USB devices. There are four configuration options: [Enabled], [Auto] and [UEFI Setup Only]. The default value is [Auto]. Please refer to below descriptions for the details of these four options:

[Enabled] - Enables support for legacy USB.

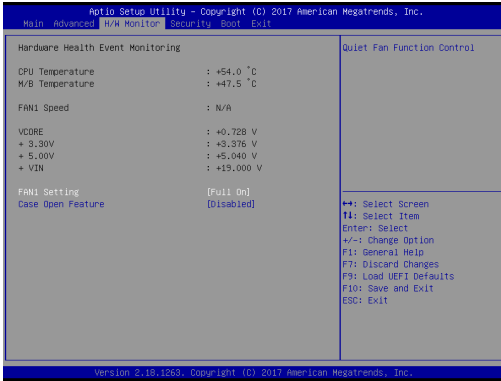
[Auto] - Enables legacy support if USB devices are connected.

[UEFI Setup Only] - USB devices are allowed to use only under UEFI setup and Windows / Linux OS.

---

## 3.4 Hardware Health Event Monitoring Screen

In this section, it allows you to monitor the status of the hardware on your system, including the parameters of the CPU temperature, motherboard temperature, CPU fan speed, chassis fan speed, and the critical voltage.



### FAN1 Setting

This allows you to set fan 1's speed. Configuration options: [Full On] and [Automatic Mode]. The default value is [Full On].

### Case Open Feature

This allows you to enable or disable case open detection feature. The default is value [Disabled].

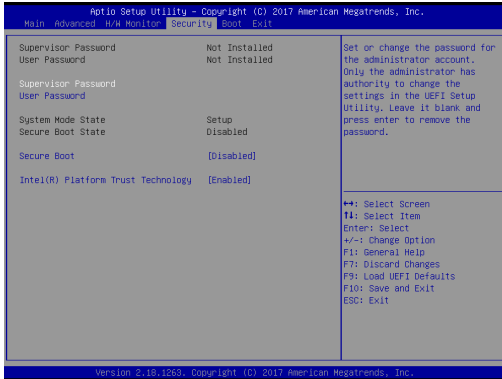
### Clear Status

This option appears only when the case open has been detected. Use this option to keep or clear the record of previous chassis intrusion status.

---

## 3.5 Security Screen

In this section, you may set, change or clear the supervisor/user password for the system.



### Supervisor Password

Set or change the password for the administrator account. Only the administrator has authority to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

### User Password

Set or change the password for the user account. Users are unable to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

### Secure Boot

Enable to support Windows 8 / 8.1 Secure Boot.

### Intel(R) Platform Trust Technology

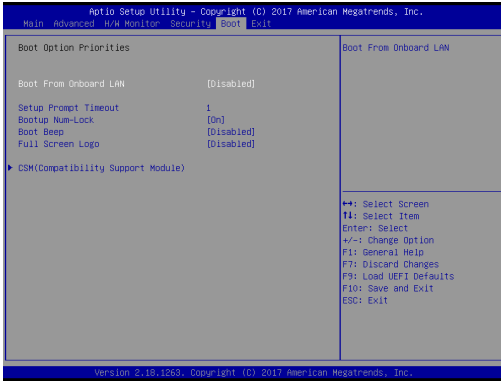
Enable/disable Intel PTT in ME. Disable this option to use discrete TPM Module.



---

## 3.6 Boot Screen

In this section, it will display the available devices on your system for you to configure the boot settings and the boot priority.



### Boot From Onboard LAN

Use this item to enable or disable the Boot From Onboard LAN feature.

### Setup Prompt Timeout

This shows the number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.

### Bootup Num-Lock

If this item is set to [On], it will automatically activate the Numeric Lock function after boot-up.

### Boot Beep

Select whether the Boot Beep should be turned on or off when the system boots up. Please note that a buzzer is needed.

### Full Screen Logo

Use this item to enable or disable OEM Logo. The default value is [Disabled].

---

## CSM (Compatibility Support Module)



### CSM

Enable to launch the Compatibility Support Module. Please do not disable unless you're running a WHCK test. If you are using Windows® 8 / 8.1 64-bit and all of your devices support UEFI, you may also disable CSM for faster boot speed.

### Launch PXE OpROM Policy

Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. Select Do not launch to not execute both legacy and UEFI option ROM.

### Launch Video OpROM Policy

Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. Select Do not launch to not execute both legacy and UEFI option ROM.

---

## 3.7 Exit Screen



### Save Changes and Exit

When you select this option, it will pop-out the following message, "Save configuration changes and exit setup?" Select [OK] to save the changes and exit the UEFI SETUP UTILITY.

### Discard Changes and Exit

When you select this option, it will pop-out the following message, "Discard changes and exit setup?" Select [OK] to exit the UEFI SETUP UTILITY without saving any changes.

### Discard Changes

When you select this option, it will pop-out the following message, "Discard changes?" Select [OK] to discard all changes.

### Load UEFI Defaults

Load UEFI default values for all the setup questions. F9 key can be used for this operation.

### Launch EFI Shell from filesystem device

Attempts to Launch EFI Shell application (Shell64.efi) from one of the available filesystem devices.

---

## **Chapter 4: Software Support**

### **4.1 Install Operating System**

This motherboard supports Microsoft® Windows® operating systems: 10 64-bit. Because motherboard settings and hardware options vary, use the setup procedures in this chapter for general reference only. Refer to your OS documentation for more information.

### **4.2 Support CD Information**

The Support CD that came with the motherboard contains necessary drivers and useful utilities that enhance the motherboard's features.

#### **4.2.1 Running The Support CD**

To begin using the support CD, insert the CD into your CD-ROM drive. The CD automatically displays the Main Menu if "AUTORUN" is enabled in your computer. If the Main Menu did not appear automatically, locate and double click on the file "ASRSETUP.EXE" from the BIN folder in the Support CD to display the menus.

#### **4.2.2 Drivers Menu**

The Drivers Menu shows the available device's drivers if the system detects installed devices. Please install the necessary drivers to activate the devices.

#### **4.2.3 Utilities Menu**

The Utilities Menu shows the application software that the motherboard supports. Click on a specific item then follow the installation wizard to install it.

#### **4.2.4 Contact Information**

If you need to contact ASRock or want to know more about ASRock, you're welcome to visit ASRock's website at <http://www.asrock.com>; or you may contact your dealer for further information.