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SECTION 1 INTRODUCTION



This section contains general information and detailed specifications of the .Section 1 consist of the following sub-sections:

- General Descriptions
- System Specifications
- Dimensions
- I/O Outlets
- Packing List
- Model List

1.1 General Descriptions

A fanless embedded system with 6th/7th generation Intel® Core™ i7/i5/i3 and Celeron® processor (formally codename: Skylake/Kabylake) processor with flexible I/O design. To fulfill different application needs, the flexible embedded system supports Windows® 10 and Linux, and it can be wall-mounted and Din-rail mounted by optional requests.

The is built with an IP40-rated heavy-duty aluminum extrusion, enabling reliable operation in harsh environments. Moreover, a wide range 9 to 36V DC power input with power protection, -40°C to +50°C extended temperature. To highly reduce deployment time, this fan-less embedded PC supports one optional I/O door and one PCIe x4 expansion slot for customers to easily install additional I/O output. It is perfectly suitable for industrial grade applications and motion/vision markets.

Features

- LGA1151 socket 6th/7th generation Intel® Core™ i7/i5/i3 & Celeron® processor with Intel® H110
- Supports Jumbo Frame (9.5k), WoL, PXE Remote Boot, Teaming
- Wide range of DC power input supported from 9 to 36VDC
- One DisplayPort and two HDMI (one HDMI 2.0) with triple view supported
- Various of flexible I/O modules supported
- One PCIe x4 expansion slot supported

Reliable and Stable Design

The embedded system supports 6th/7th generation Intel® Core™ i7/i5/i3 and Celeron® processors, high flexibility and multi-functional design is the best solution for industrial field applications and motion/vision markets.

Flexible Connectivity

It comes with rich I/O interfaces including two RS-232 ports, four USB 3.0 ports, two USB 2.0 ports, four GbE LAN ports and one flexible I/O window and one PCIe x4 expansion slot.

Embedded O.S. Supported

supports Windows® 10 and Linux.

Various Storage Supported

In terms of storage,
one mSATA device.

supports one 2.5" SATA storage drive bay and

1.2 System Specifications

1.2.1 CPU

- **CPU**
 - LGA1151 socket 7th / 6th generation Intel® Core™ i7/i5/i3 & Celeron® processor, CPU TDP max. up to 35W
- **Chipset**
 - Intel® H110
- **BIOS**
 - American Megatrends Inc. UEFI (Unified Extensible Firmware Interface) BIOS.
- **System Memory**
 - Two 260-pin unbuffered DDR4-2133 MHz SO-DIMM socket, up to 32 GB at the maximum

1.2.2 I/O System

- **Display**
 - 2 x HDMI
(1 x HDMI 2.0 Resolution:4K/2K@60Hz & 1 x HDMI 1.4b Resolution : 4K/2K@30Hz)
 - 1 x DisplayPort (Resolution:4K/2K@60Hz)
- **Ethernet**
 - 4 x 10/100/1000 Ethernet ports (3 x i210IT & 1 x i219LM)
- **USB Ports**
 - 2 x USB 2.0
 - 4 x USB 3.0
 - 1 x internal USB Dongle
- **Serial Ports**
 - 2 x RS-232(COM1~2)
- **Audio**
 - 1 x Audio (Mic-in/Line-out)
- **Mini PCIe Interface**
 - 1 x full-size PCI Express Mini Card Slots (USB + PCI Express signal)
 - 1 x full-size PCI Express Mini Card Slots (USB + SATA signal)
- **Expansion Slot**
 - 1 x PCIe x4

Note: Supports dimensions of standard half size PCIE card.

(Max. up 167.65mm x 111.15mm x 18.71mm)

Note: max. Up to 25W for the PCIe x4 expansion slot
- **Storage**
 - 1 x 2.5" SATA HDD/SSD drive bay
 - 1 x mSATA (optional)
 - 1 x SIM slot
- **Indicator**
 - 1 x Green LED as indicator for PWR status
 - 1 x Yellow LED as indicator for HDD active
 - 4 x Green LED as indicator for programmable
- **Switch**
 - 1 x ATX PWR switch
 - 1 x Remote PWR switch
 - 1 x AT/ATX Quick switch
 - 1 x Reset switch
- **Antenna**
 - 4 x SMA type connector openings for antenna

1.2.3 System Specifications

- **Watchdog Timer**
 - 1~255 seconds or minutes; up to 255 levels.
- **Power Supply**
 - 9~36VDC input
- **Operation Temperature**
 - -40°C ~+50°C (-40 °F ~ 122°F), with W.T. SSD & Memory)
- **Humidity**
 - 10% ~ 95% (non-condensation)
- **Vibration Endurance**
 - 3Grm with SSD (5-500Hz, X, Y, Z directions)
- **Weight**
 - 3.8 kg (8.37 lb) without package
 - 4.6 kg (10.14 lb) with package
- **Dimension**
 - 280 mm (11.02") (W) x 190 mm (7.48") (D) x 76 mm (2.99") (H)

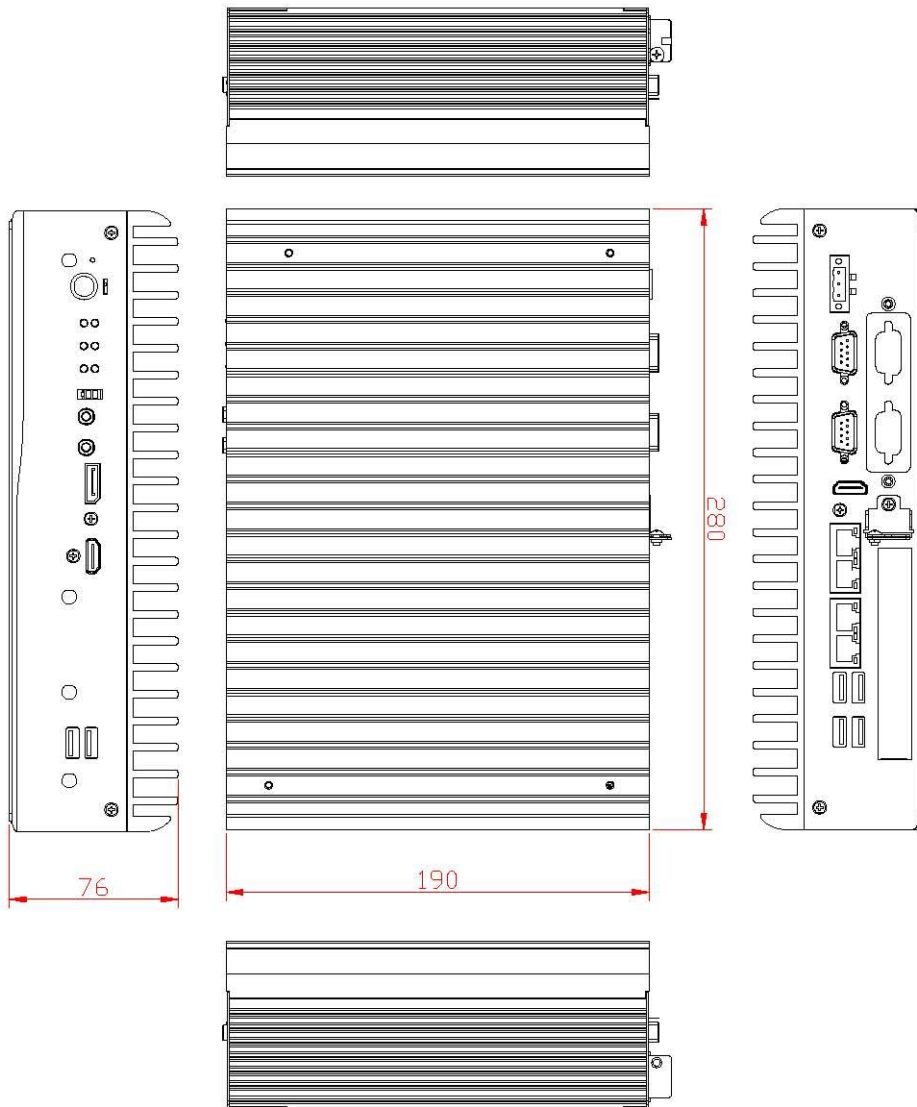
1.2.4 Driver CD Contents

- Ethernet
- Chipset
- Graphic
- Serial Port
- Intel® ME
- Audio
- AXVIEW 2.0
- User Manual
- Quick Manual

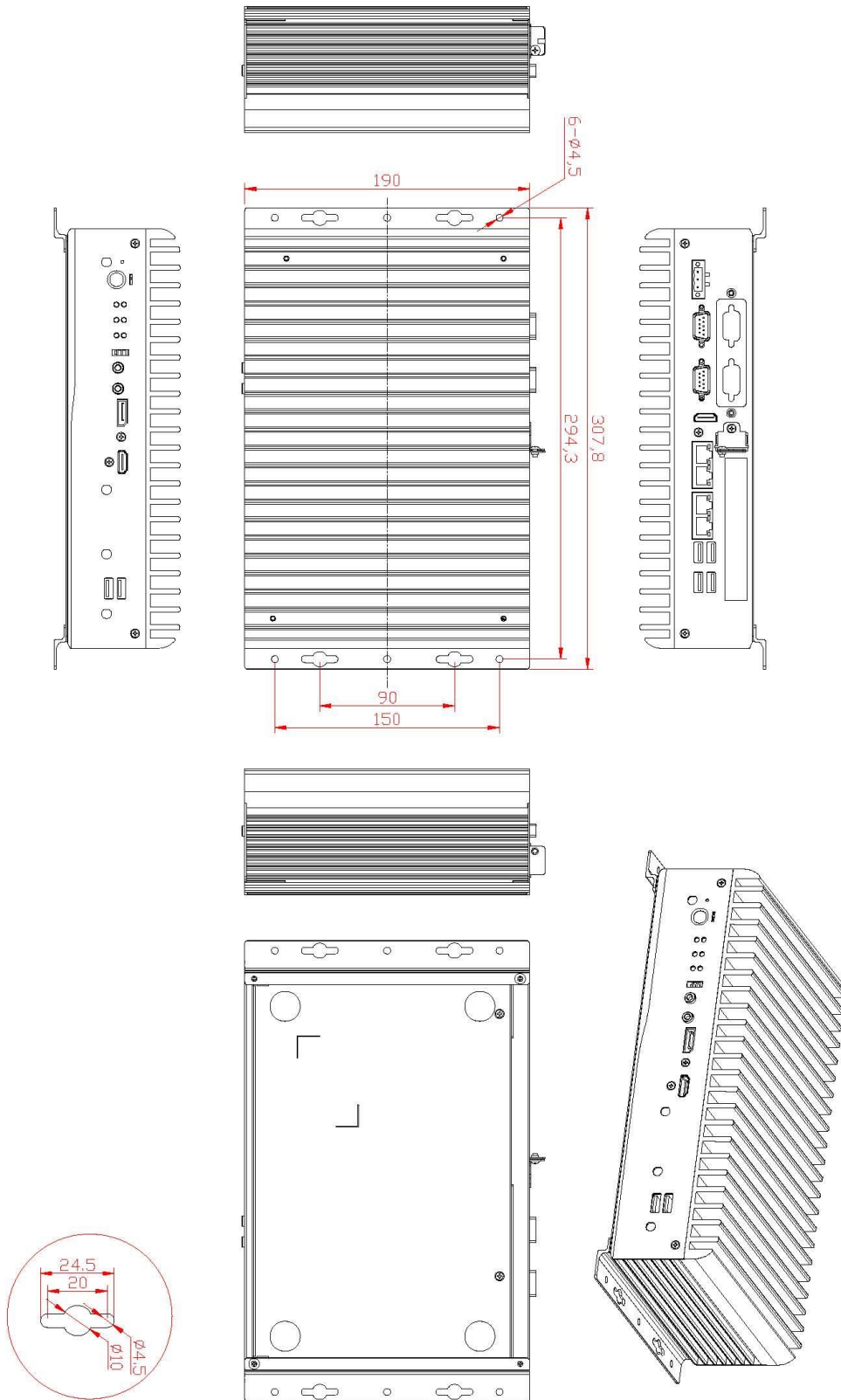
1.3 Dimensions

The following diagrams show dimensions and outline

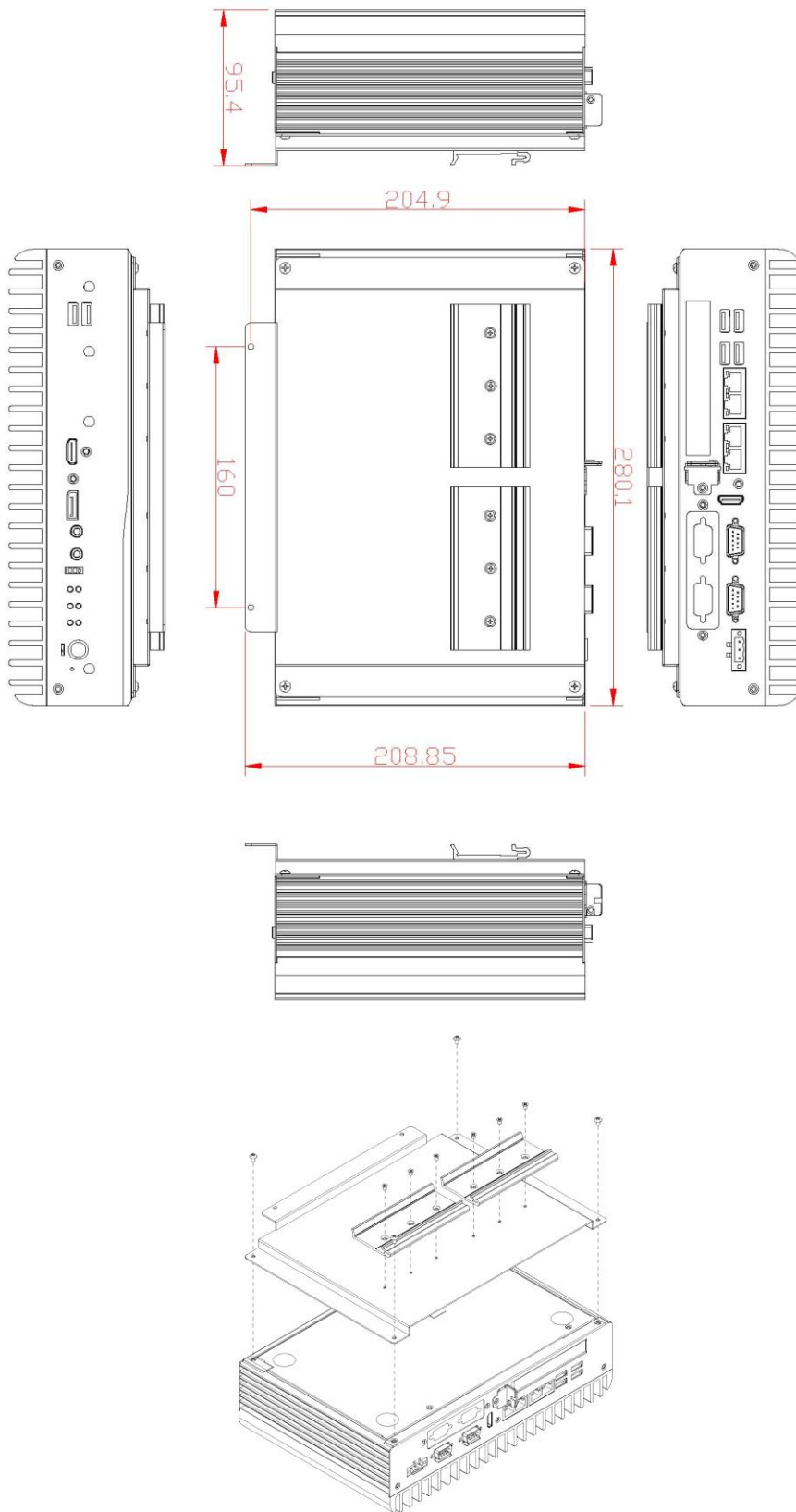
1.3.1 System Dimensions



1.3.2 Wall-mount Bracket Dimensions



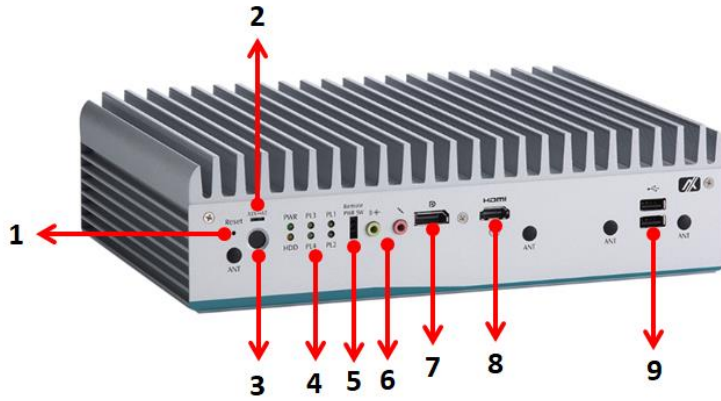
1.3.3 Din-rail Bracket Dimensions



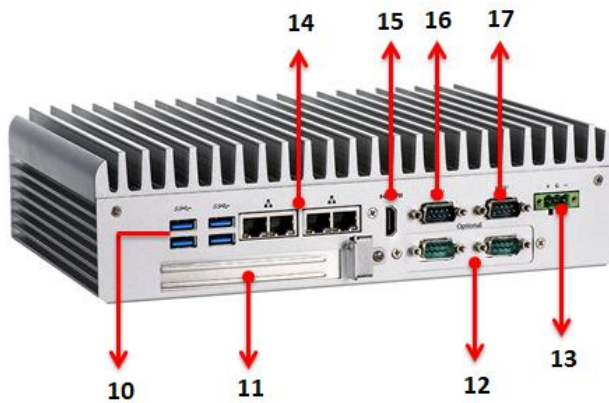
1.4 I/O Outlets

The following figures show I/O outlets on the

Front View



Rear View



1	Reset switch	7	DisplayPort	13	Phoenix connector(9-36VDC)
2	ATX/AT Quick switch	8	HDMI 1.4	14	4 x GbE LANs
3	ATX Power switch	9	2 x USB 2.0	15	HDMI 2.0
4	4 x Programmer LED	10	4 x USB 3.0	16	COM 2
5	Remote power switch	11	PCIe x4 slot	17	COM 1
6	Audio (Mic-in/Line out)	12	Flexible IO door		

1.5 Packing List

The _____ comes with the following bundle package:

- **System Unit x 1**
- **Quick Installation Guide x 1**
- **DVD x 1 (For Driver and Manual)**
- **CPU Thermal Pad x 2**
- **PCH Thermal Pad x 1**
- **HDD screws x 2**
- **Terminal Block x 1**
- **Remote switch cable x 1**
- **HDD Bracket x 1**

1.6 Model List

	Fanless Embedded System with LGA1151 Socket 6th/7th Gen Intel® Core™ i7/i5/i3& Celeron® Processor, Intel® H110, 2 HDMI/DisplayPort, 4 GbE LANs, 6 USB, 1 PCIe x4 Expansion and 9 ~ 36 VDC
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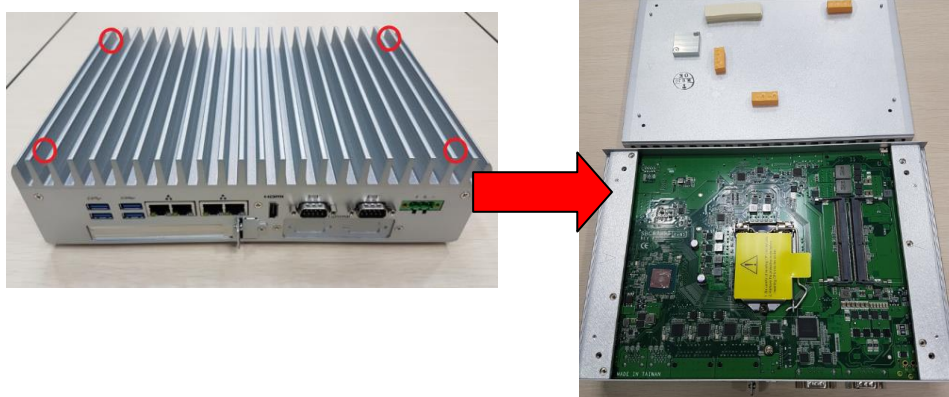
SECTION 2 HARDWARE INSTALLATION

The is convenient for various hardware configurations, such as CPU, DRAM, HDD (Hard Disk Drive), SSD (Solid State Drive), PCIe x4 expansion slot and PCI Express Mini card modules. Section 2 contains guidelines for hardware installation.

2.1 Installation of CPU

Step 1 Turn off the system.

Step 2 Loosen all screws to remove top cover.



Step 3 Remove the warning label and disengage load lever.

- Disengage load lever by releasing down and out on the hook.
- Rotate load lever to open position at approximately 135°.
- Rotate load plate to open position at approximately 150°.



Note

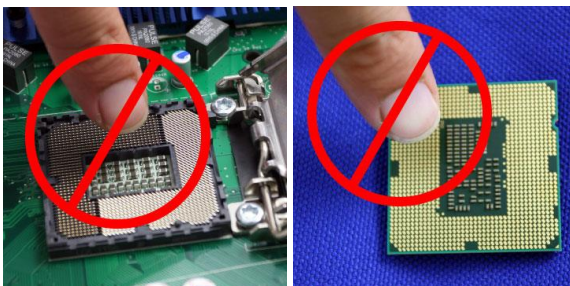
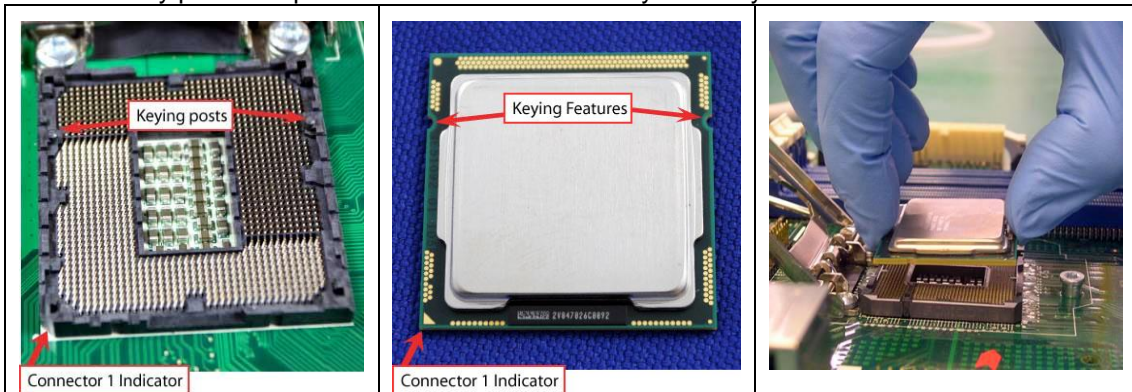
Apply pressure to corner with right-hand thumb when opening or closing load lever - otherwise lever will bounce back (as a mouse trap) causing bent contacts.

Step 4 CPU installation steps:

- Lift processor package from shipping media by grasping the substrate edges.



- Scan the processor package gold pads for any presence of foreign material.
- Locate connection 1 indicator on the processor which aligns with connection 1 indicator chamfer on the socket, and notice processor keying features that line up with posts along socket walls.
- Grasp the processor with thumb and index finger along the top and bottom edges. The socket will have cutouts for your fingers to fit into.
- Carefully place the processor into the socket body vertically.



Caution

Never touch fragile socket contacts to avoid damage and do not touch processor sensitive contacts at any time during installation.

Step 5 Align pins of the CPU with pin holes of the socket. Be careful of the CPU's orientation that user's need to align the arrow mark on the CPU with the arrow key on the socket.



Step 6 Paste the thermal pad on top of the processor with caution, and then remove protection film.



Step 7 Put the top cover and fasten four screws back onto the system.

2.2 Installation of 2.5" SATA Device

Step 1 Turn off the system.

Step 2 Turn the system upside down to locate screws at the bottom and then loosen all screws.

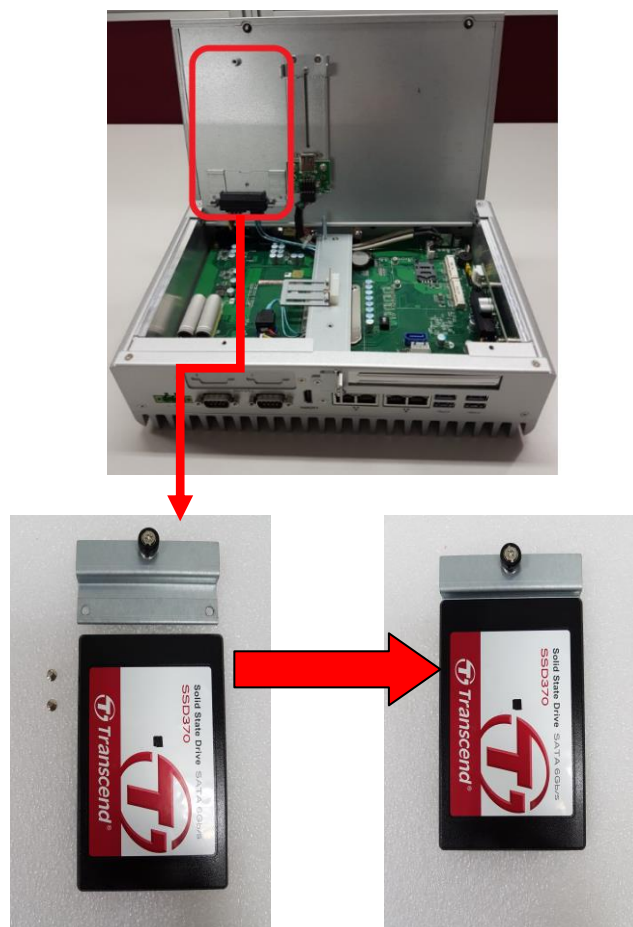
Step 3 Open the bottom cover.

Step 4 Locate SSD/HDD within the red line as marked.

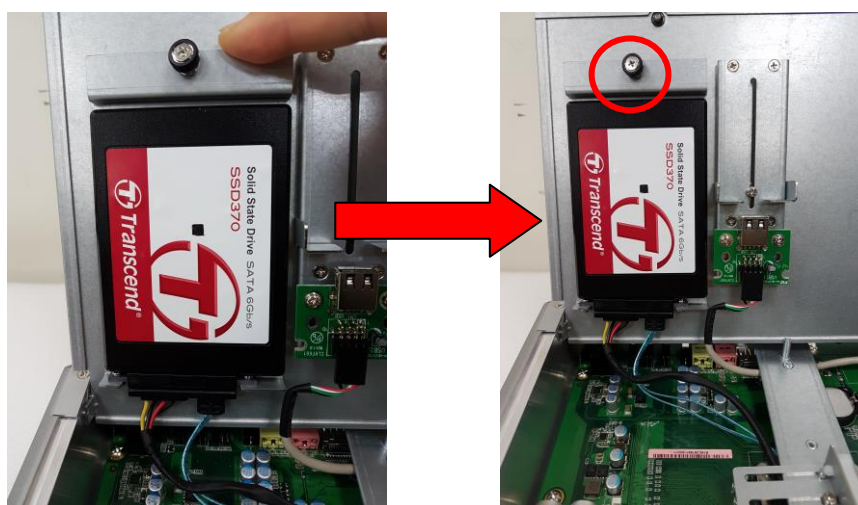
Please notice the direction of connector for HDD.



Step 5 Before assemble the SSD/HDD, please prepare HDD bracket/HDD/ screws, and then assemble the SSD / HDD with the HDD mounting screws. Make sure the PCB side of the SSD/HDD will be facing the bottom cover.



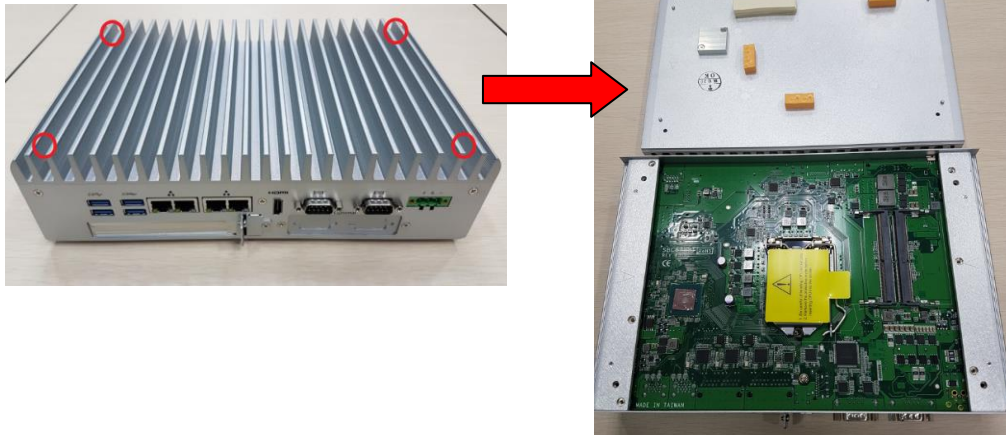
Step 6 Connected the SSD/HDD directly and make sure the insertion is complete and fasten the thumb screw.



2.3 Installation of SO-DIMM

Step 1 Turn off the system.

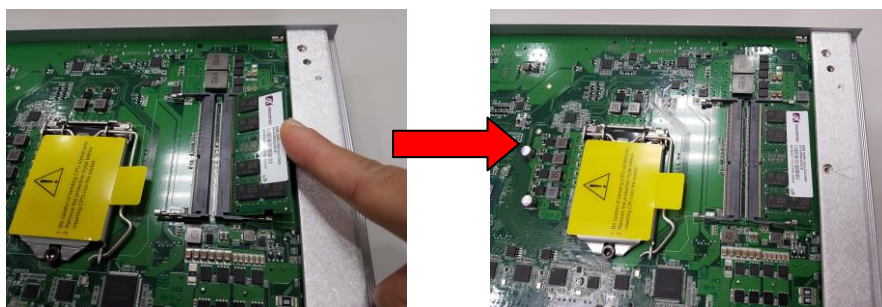
Step 2 Four screws on the top heatsink are used to fasten the heatsink to the chassis.



Step 3 Located the dual SO-DIMM sockets on main board.



Step 4 Locate the memory module, insert a gold colored contact into the socket and push the module two end latches till locked.



Step 5 Put the top cover and fasten four screws back onto the system.

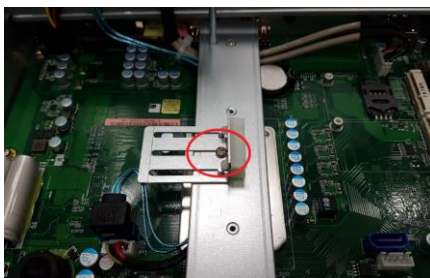
2.4 Installation of PCIe card

Step 1 Turn off the system

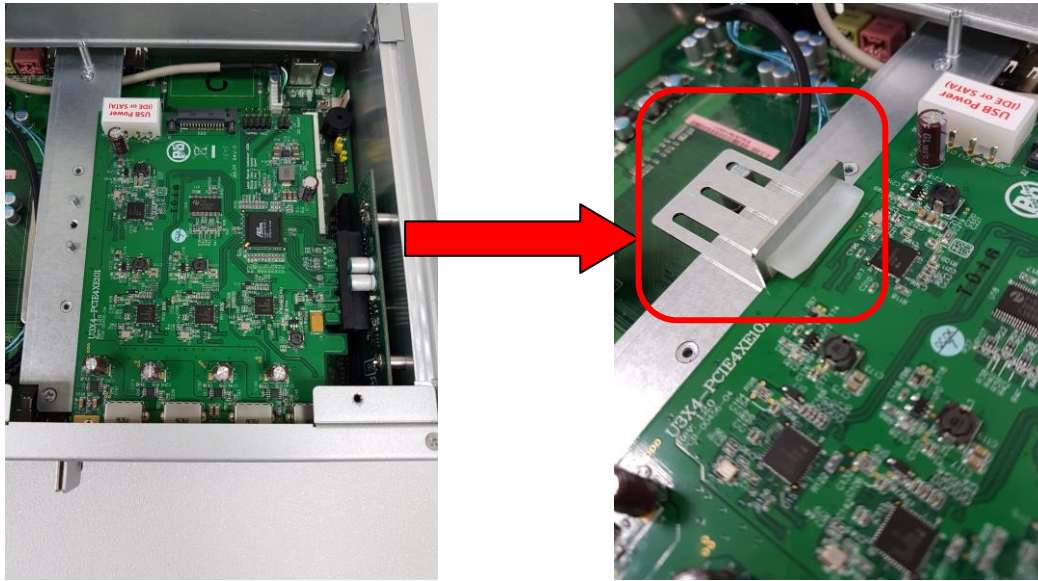
Step 2 Turn the system upside down to locate screws at the bottom, and then loosen all screws.

Step 3 Identify the location of the PCIe slot as below red marked.

Step 4 Loosen the screws of the slot bracket and PCIe card bracket.



Step 5 Insert the PCIe card and fasten the screw of PCIe card adjustable bracket.



Step 6 Fasten the small bracket screw and put the bottom cover back onto the chassis.



2.5 Installation of Flexible I/O Modules

The an optional window for customer add flexible I/O modules, according to different modules , please re follow the below Instructions:

- AX92902 LAN Module (RJ45 connector*1)
- AX92904 DIO Module (DB44 connector*1)
- AX92903 CAN Bus/CAN Open Module (DB9 connector*1)
- AX92906 COM Module (DB9 connector*2)



Flexible IO window

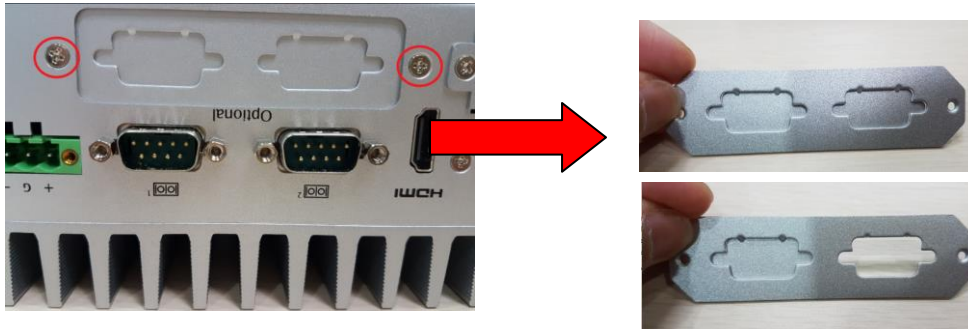
(Default: 2 x DB9 half cut bracket)

Step 1 Prepare the flexible IO module (ex: CAN Bus module kit).

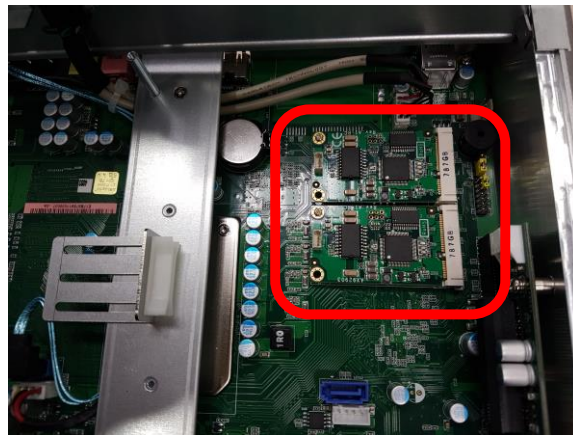
Step 2 Turn off the system.

Step 3 Open the bottom cover.

Step 4 Loosen the two screws of flexible IO door and push the hole which is not punched through.



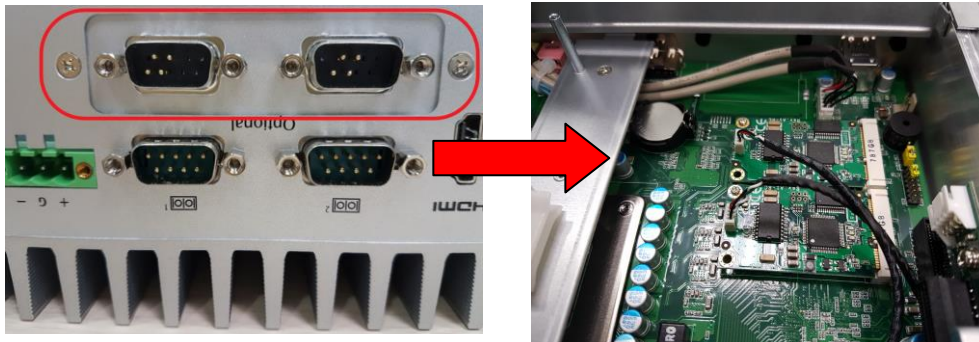
Step 5 Insert the CAN Bus mini PCIe card (One mini card with one DB 9 connector)



Step 6 Assemble CAN Bus connector with bracket.



Step 7 Fasten the CAN Bus connector with bracket onto the chassis, and then connect the CAN Bus cable to the mini PCIe card.



Step 8 Put the bottom cover and fasten two screws back onto the system.

2.6 Installation of USB Dongle kit

an adjustable USB dongle bracket for customer use:

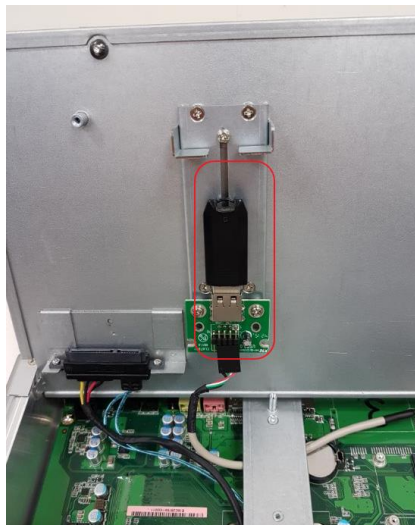
Step 1 Turn off the system.

Step 2 Turn the system upside down to locate screws at the bottom and then loosen all screws.

Step 3 Locate USB dongle bracket within the red line as marked.



Step 4 Insert the USB and fasten the screw of the adjustable bracket.

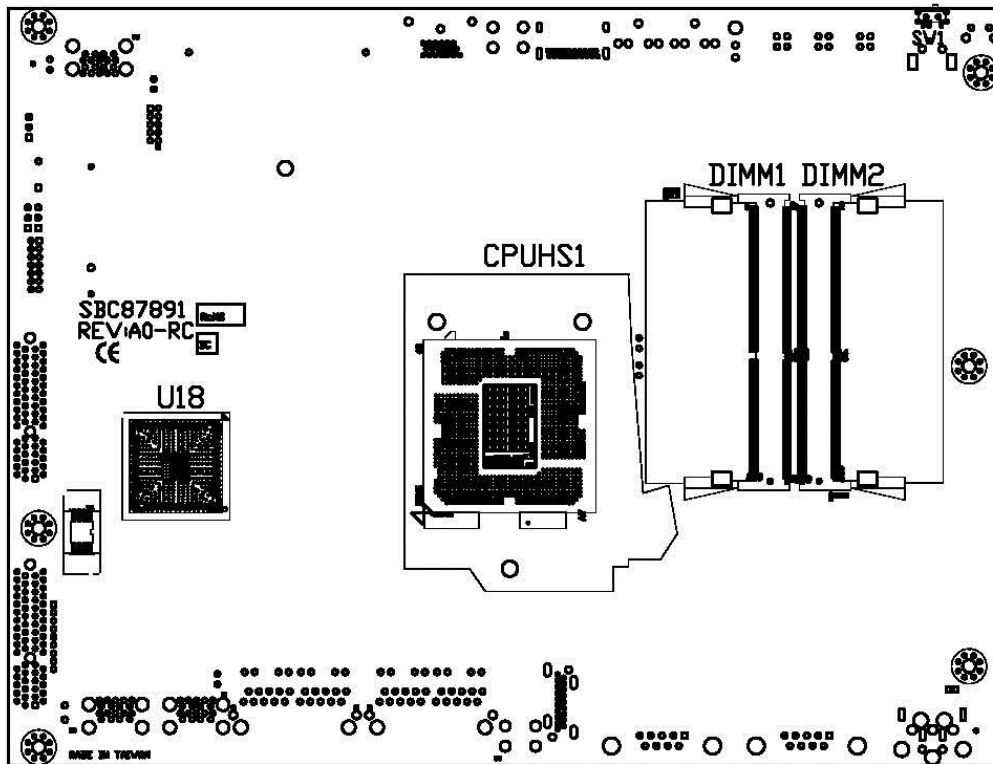


SECTION 3 JUMPER & CONNECTOR SETTINGS

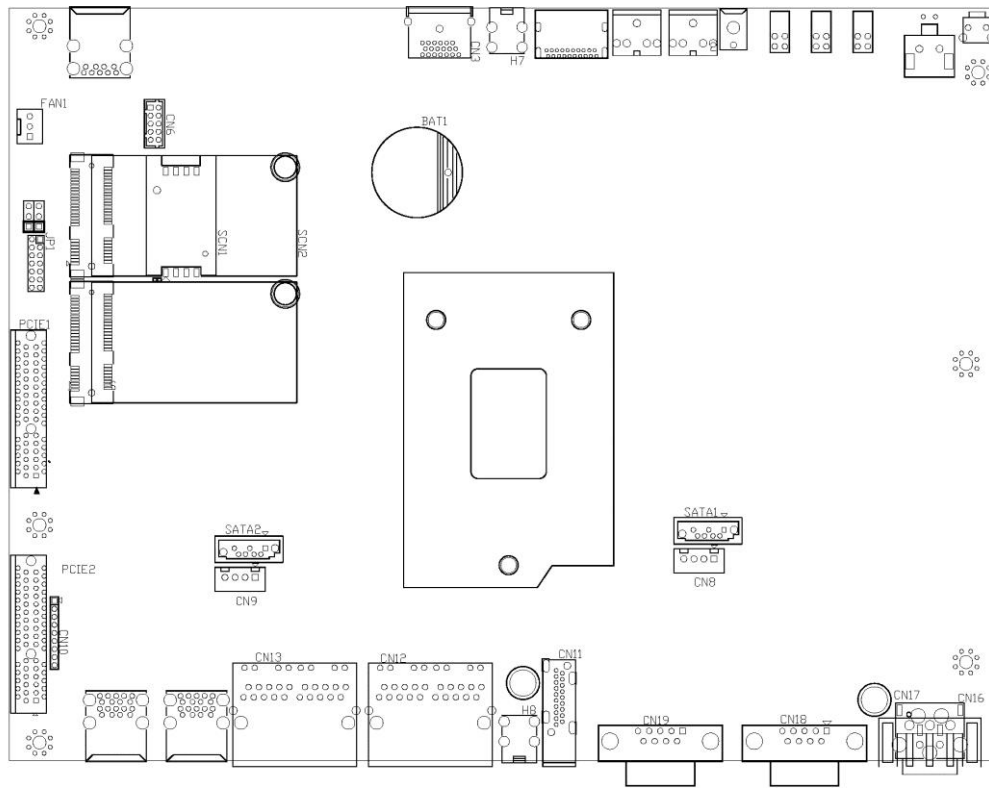
Proper jumper settings configure the _____ to meet various application needs. Hereby all jumpers settings along with their default settings are listed for devices onboard.

3.1 Locations of Jumpers & Connectors

Top View



Bottom View

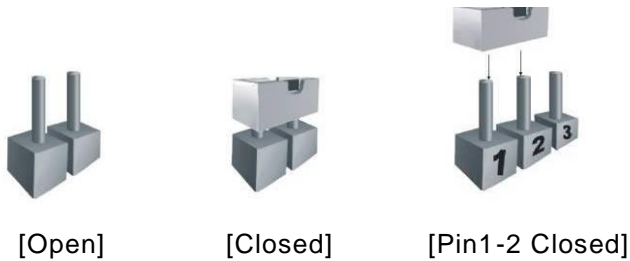


3.2 Summary of Jumper Settings

Proper jumper settings configure the to meet various application purposes. A table of all jumpers and their default settings is listed below.

Jumpers	Descriptions	Settings
JP1	Restore BIOS Optimal Defaults Default: Normal Operation	Short 1-2

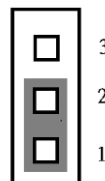
That a cap on a jumper is to “close” the jumper, whereas that offs a jumper is to “open” the jumper.



3.2.1 Restore BIOS Optimal Defaults (JP1)

Put jumper clip to pin 2-3 for a few seconds then move it back to pin 1-2. This procedure is to restore BIOS optimal defaults.

Functions	Settings
Normal (Default)	1-2
Clear RTC	2-3



3.3 Connectors

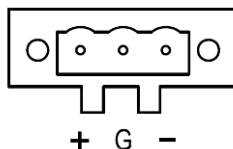
Please refer to pin assignments below:

External Connectors	Sections
DC-in Phoenix Power Connector	3.3.1
HDMI Connector	3.3.2
DisplayPort Connector	3.3.3
Serial Port Connector	3.3.4
USB 3.0 Connector	3.3.5
Ethernet Connector	3.3.6
USB 2.0 Connector	3.3.7
Audio Connector	3.3.8
ATX Power On/Off Button	3.3.9
Rest Button	3.3.10
Remote Power Switch Connector	3.3.11
AT/ATX Switch	3.3.12
Internal Connectors	Sections
Serial ATA (SATA) Connector	3.3.13
SATA Power Connector	3.3.14
SIM Card Slot (SCN1)	3.3.15
Full-Size Express Mini Card slot (SCN2 & SCN3)	3.3.16
PCIe x4 slot	3.3.17

3.3.1 DC-in Phoenix Power Connector (CN17)

The system supports 9~36V Phoenix DC-in connector for system power input.

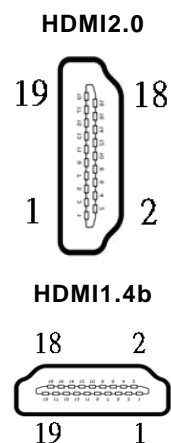
Pins	Signals
1	DC+
2	GND
3	DC-



3.3.2 HDMI Connector (CN11/CN3)

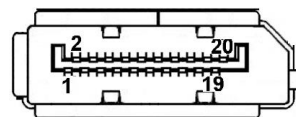
The HDMI (High-Definition Multimedia Interface) is a compact digital interface which is capable of transmitting high-definition video and high-resolution audio over a single cable.

Pins	Signals	Pins	Signals
1	HDMI OUT_DATA2+	11	GND
2	GND	12	HDMI OUT Clock-
3	HDMI OUT_DATA2-	13	N.C.
4	HDMI OUT_DATA1+	14	N.C.
5	GND	15	HDMI OUT_SCL
6	HDMI OUT_DATA1-	16	HDMI OUT_SDA
7	HDMI OUT_DATA0+	17	GND
8	GND	18	+5V
9	HDMI OUT_DATA0-	19	HDMI_HTPLG
10	HDMI OUT Clock+		



3.3.3 DisplayPort Connector (CN4)

Pins	Signals	Pins	Signals
1	DPB_LANE0	11	GND
2	GND	12	DPB_LANE3#
3	DPB_LANE0#	13	Detect Pin
4	DPB_LANE1	14	GND
5	GND	15	DPB_AUX
6	DPB_LANE1#	16	GND
7	DPB_LANE2	17	DPB_AUX#
8	GND	18	DPB_HPDE
9	DPB_LANE2#	19	GND
10	DPB_LANE3	20	+3.3V

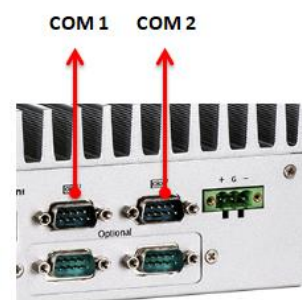


3.3.4 Serial Port Connector (CN18/CN19)

The system has two serial ports. COM1~COM2 are RS-232/422/485 ports. Please refer to Chapter 4 for the detail of BIOS setting.

※COM1 (CN18),COM2 (CN19)

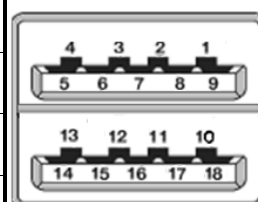
Pins	RS-232	RS-422	RS-485
1	DCD, Data Carrier Detect	TX-	Data-
2	RXD, Receive Data	TX+	Data+
3	TXD, Transmit Data	RX+	No use
4	DTR, Data Terminal Ready	RX-	No use
5	GND, Ground	No use	No use
6	DSR, Data Set Ready	No use	No use
7	RTS, Request To Send	No use	No use
8	CTS, Clear To Send	No use	No use
9	RI, Ring Indicator	No use	No use



3.3.5 USB 3.0 Connector (CN14/CN15)

The Universal Serial Bus connectors are compliant with USB 3.0 (5 GB/s), and ideally for installing USB peripherals such as scanner, camera and USB devices, etc.

Pins	Signal USB Port 0	Pins	Signal USB Port 1
1	USB_VCC (+5V level standby power)	10	USB_VCC (+5V level standby power)
2	USB_Data-	11	USB_Data-
3	USB_Data+	12	USB_Data+
4	GND	13	GND
5	SSRX-	14	SSRX-
6	SSRX+	15	SSRX+
7	GND	16	GND
8	SSTX-	17	SSTX-
9	SSTX+	18	SSTX+

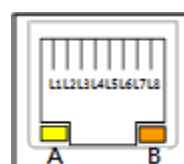


3.3.6 Ethernet Connector (CN12/CN13)

The board has four RJ-45 connectors, there are for LAN1 Ethernet-(Intel i219LM) and LAN2-4 Ethernet-(Intel i210-iT).

LAN2-4 Ethernet-(Intel i210-iT).

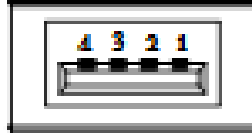
Pins	LAN Signal	Pins	LAN Signal
L1	MDI0+	L5	MDI2+
L2	MDI0-	L6	MDI2-
L3	MDI1+	L7	MDI3+
L4	MDI1-	L8	MDI3-
A	Activity link LED(Yellow) OFF: No link Blinking: Link established; data activity detected		
B	Speed LED OFF: 10Mbps data rate Green: 100Mbps data rate Orange: 1GMbps data rate		



3.3.7 USB 2.0 Connector (CN5)

The Universal Serial Bus connectors are compliant with USB 2.0 (480Mbps), and ideally for installing USB peripherals such as keyboard, mouse, scanner, etc.

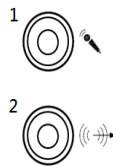
Pins	Signal USB Port
1	USB VCC (+5V level)
2	USB #0_D-
3	USB #0_D+
4	Ground (GND)



3.3.8 Audio Connector (CN1/CN2)

These two audio jacks ideal are for Audio Mic-In and Audio Line-out.

Pins	Signals
1	Line Out (CN1)
2	Microphone In (CN2)



3.3.9 ATX Power On/OFF (SW3)

The ATX power button is on the I/O side. It can allow users to control power on/off.

power

Functions	Descriptions
On	Turn on/off system
Off	Keep system status



3.3.10 Reset Button (SW2)

The Reset button can allow users to reset .

Functions	Descriptions
On	Reset system
Off	Keep system status

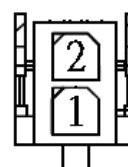
Reset



3.3.11 Remote Power Switch Connector (PWRBT1)

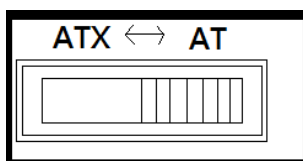
One 2-pin connector output for remote power on/off switch.

Functions	Descriptions
Short(1-2)	Turn on/off system
Open	Keep system status



3.3.12 AT/ATX Switch (SW1)

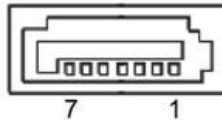
If you set AT/ATX switch to AT mode, the system will be automatically power on without pressing soft power button during power input; we can use this switch to achieve auto power on demand.



3.3.13 SATA Connector (SATA 1 & 2)

These Serial Advanced Technology Attachment (Serial ATA or SATA) connectors are for high-speed SATA interfaces. They are computer bus interfaces for connecting to devices such as hard disk drives. This board has two SATA 3.0 ports with 6Gb/s performance.

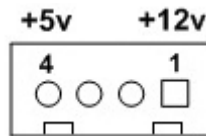
Pins	Signals
1	GND
2	SATA_TX+
3	SATA_TX-
4	GND
5	SATA_RX-
6	SATA_RX+
7	GND



3.3.14 SATA Power Connector (CN8)

Use CN8 for interfacing to SATA 2.5" HDD power supply.

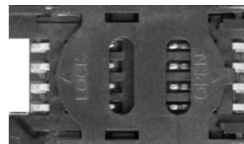
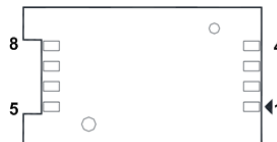
Pins	Signals
1	+12V level
2	GND
3	GND
4	+5V level



3.3.15 SIM Card Slots (SCN1)

The board includes one SIM slots (SCN1) on the bottom side of the system for inserting SIM Card. It is mainly used in 3G/LTE wireless network application on SCN3.

Pins	Signals
1	PWR
2	RST
3	CLK
4	NC
5	GND
6	VPP
7	I/O
8	NC



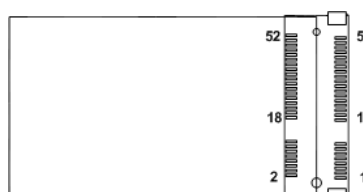
3.3.16 Full-Size PCI Express Mini Card Slot (SCN2 & SCN3)

supports dual full-size PCI-Express Mini Card slots. SCN2 is applying to either PCI-Express or USB 2.0 signal, and complies with PCI-Express Mini Card Spec. V1.2.

SCN3 is applying for PCI-Express and SATA (mSATA) signals and complies with PCI-Express Mini Card Spec. V1.2. Thus, users can install mSATA cards into this slot. Please refer to the SATA of BIOS setting to enable or disable mSATA supported

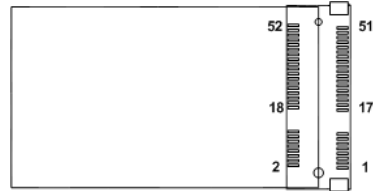
SCN2

Pins	Signals	Pins	Signals
1	WAKE#	2	+3.3VSB
3	No use	4	GND
5	No use	6	+1.5V
7	CLKREQ#	8	No use
9	GND	10	No use
11	REFCLK-	12	No use
13	REFCLK+	14	No use
15	GND	16	No use
17	No use	18	GND
19	No use	20	W_DISABLE#
21	GND	22	PERST#
23	PE_RXN3/	24	+3.3VSB
25	PE_RXP3/	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PE_TXN3/	32	SMB_DATA
33	PE_TXP3/	34	GND
35	GND	36	USB_D8-
37	GND	38	USB_D8+
39	+3.3VSB	40	GND
41	+3.3VSB	42	No use
43	GND	44	No use
45	No use	46	No use
47	No use	48	+1.5V
49	No use	50	GND
51	No use	52	+3.3VSB



SCN3

Pins	Signals	Pin	Signals
1	WAKE#	2	+3.3VSB
3	No use	4	GND
5	No use	6	+1.5V
7	CLKREQ#	8	No use
9	GND	10	No use
11	REFCLK-	12	No use
13	REFCLK+	14	No use
15	GND	16	No use
17	No use	18	GND
19	No use	20	W_DISABLE#
21	GND	22	PERST#
23	PE_RXN3/mSATA	24	+3.3VSB
25	PE_RXP3/mSATA	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PE_TXN3/ mSATA	32	SMB_DATA
33	PE_TXP3/ mSATA	34	GND
35	GND	36	USB_D8-
37	GND	38	USB_D8+
39	+3.3VSB	40	GND
41	+3.3VSB	42	No use
43	GND	44	No use
45	No use	46	No use
47	No use	48	+1.5V
49	No use	50	GND
51	No use	52	+3.3VSB



3.3.17 PCI-Express x4 slot (PCIE1)

supports one PCI-express x4 slot.

Pin	Signal	Pin	Signal
B1	+12V_PS	A1	GND
B2	+12V_PS	A2	+12V_PS
B3	+12V_PS	A3	+12V_PS
B4	GND	A4	GND
B5	SMB_CLK_RESUME	A5	N/C
B6	SMB_DATA_RESUME	A6	N/C
B7	GND	A7	N/C
B8	+3.3V_PS	A8	N/C
B9	N/C	A9	+3.3V_PS
B10	+3.3V_SB	A10	+3.3V_PS
B11	PCH_WAKE_N	A11	PWRGD
B12	N/C	A12	GND
B13	GND	A13	CLKOUT_PCIE_P5
B14	PCIE1_SLOT1_TX_DP_C	A14	CLKOUT_PCIE_N5
B15	PCIE1_SLOT1_TX_DN_C	A15	GND
B16	GND	A16	PCIE1_SLOT1_RX_DP_C
B17	PCIEX4_SLOT1_PRSENT2_N	A17	PCIE1_SLOT1_RX_DN_C
B18	GND	A18	GND
B19	PCIE2_TX_DP	A19	N/C
B20	PCIE2_TX_DN	A20	GND
B21	GND	A21	PCIE2_RX_DP
B22	GND	A22	PCIE2_RX_DN
B23	PCIE3_TX_DP	A23	GND
B24	PCIE3_TX_DN	A24	GND
B25	GND	A25	PCIE3_RX_DP
B26	GND	A26	PCIE3_RX_DN
B27	PCIE4_TX_DP	A27	GND
B28	PCIE4_TX_DN	A28	GND
B29	GND	A29	PCIE4_RX_DP
B30	N/C	A30	PCIE4_RX_DN
B31	N/C	A31	GND
B32	GND	A32	N/C

SECTION 4

BIOS SETUP UTILITY

This section provides users with detailed descriptions in terms of how to set up basic system configurations through the BIOS setup utility.

4.1 Starting

To enter the setup screens, follow the steps below:

1. Turn on the computer and press the key immediately.
2. After press the key, the main BIOS setup menu displays. Users can access to other setup screens, such as the Advanced and Chipset menus, from the main BIOS setup menu.

It is strongly recommended that users should avoid changing the chipset's defaults. Both AMI and system manufacturer have carefully set up these defaults that provide the best performance and reliability.

4.2 Navigation Keys

The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process. These keys include <F1>, <F2>, <Enter>, <ESC>, <Arrow> keys, and so on.

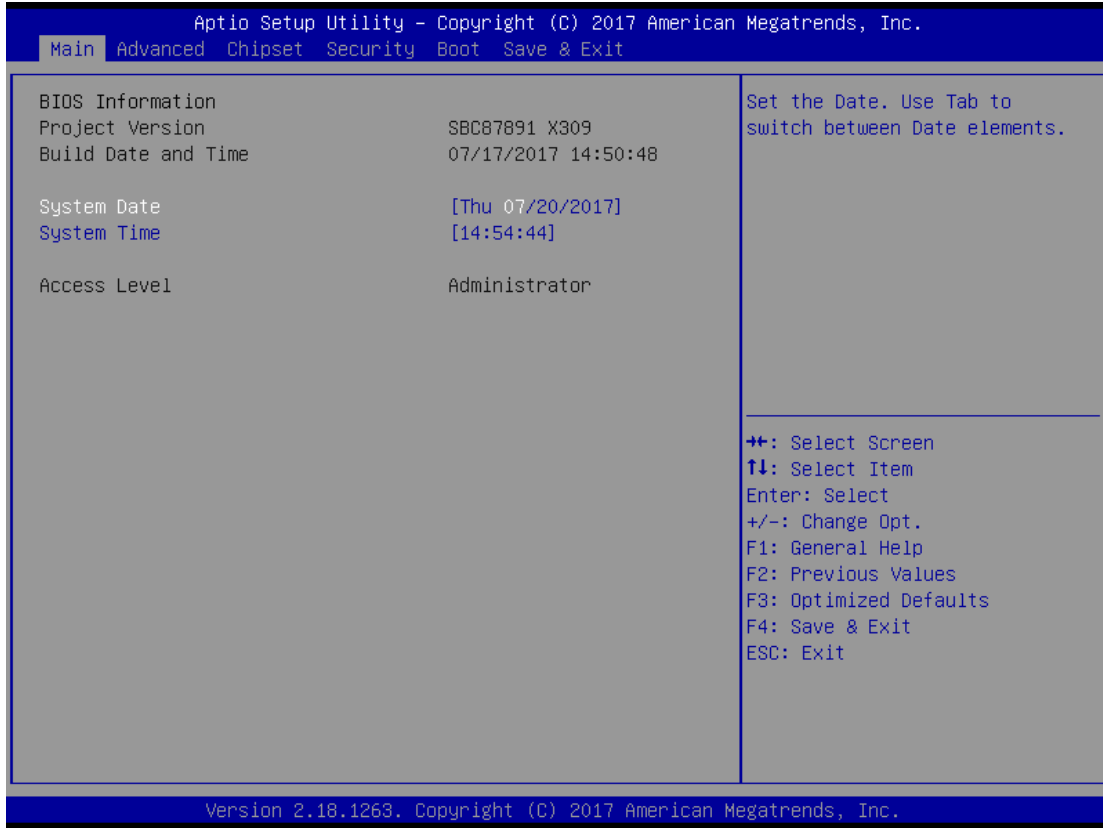


【Note】 : *Some of the navigation keys differ from one screen to another.*

Hot Keys	Descriptions
→← Left/Right	The Left and Right <Arrow> keys allow users to select a setup screen.
↑↓ Up/Down	The Up and Down <Arrow> keys allow users to select a setup screen or sub-screen.
+– Plus/Minus	The Plus and Minus <Arrow> keys allow users to change the field value of a particular setup item.
Tab	The <Tab> key allows users to select setup fields.
F1	The <F1> key allows users to display the General Help screen.
F2	The <F2> key allows users to Load Previous Values.
F3	The <F3> key allows users to Load Optimized Defaults.
F4	The <F4> key allows users to save any changes they made and exit the Setup. Press the <F4> key to save any changes.
Esc	The <Esc> key allows users to discard any changes they made and exit the Setup. Press the <Esc> key to exit the setup without saving any changes.
Enter	The <Enter> key allows users to display or change the setup option listed for a particular setup item. The <Enter> key can also allow users to display the setup sub- screens.

4.3 Main Menu

The Main Menu screen is the first screen users see when entering the setup utility. Users can always return to the Main setup screen by selecting the Main tab. System Time/Date can be set up as described below. The Main BIOS setup screen is also shown below.



BIOS Information

Display the auto-detected BIOS information.

System Language

Choose the system default language.

System Date/Time

Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

Access Level

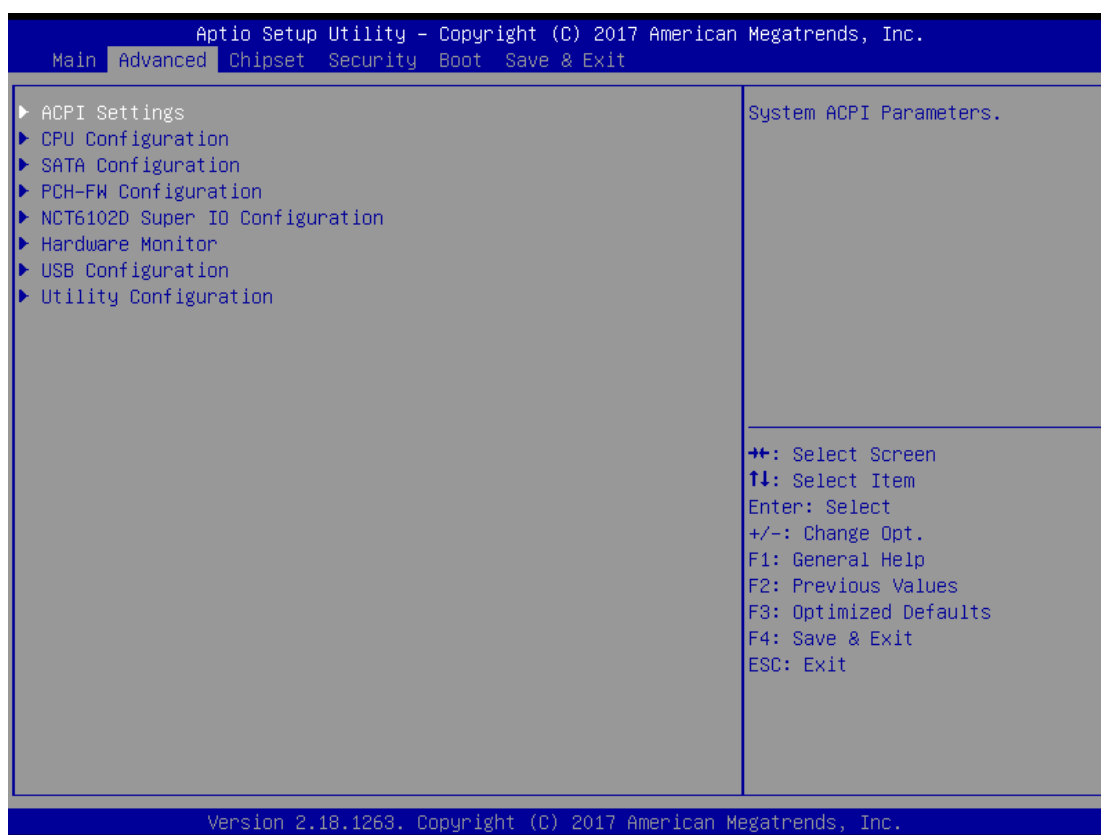
Display the access level of current user.

4.4 Advanced Menu

The Advanced menu also allows users to set configuration of the CPU and other system devices. Users can select any items in the left frame of the screen to go to sub menus:

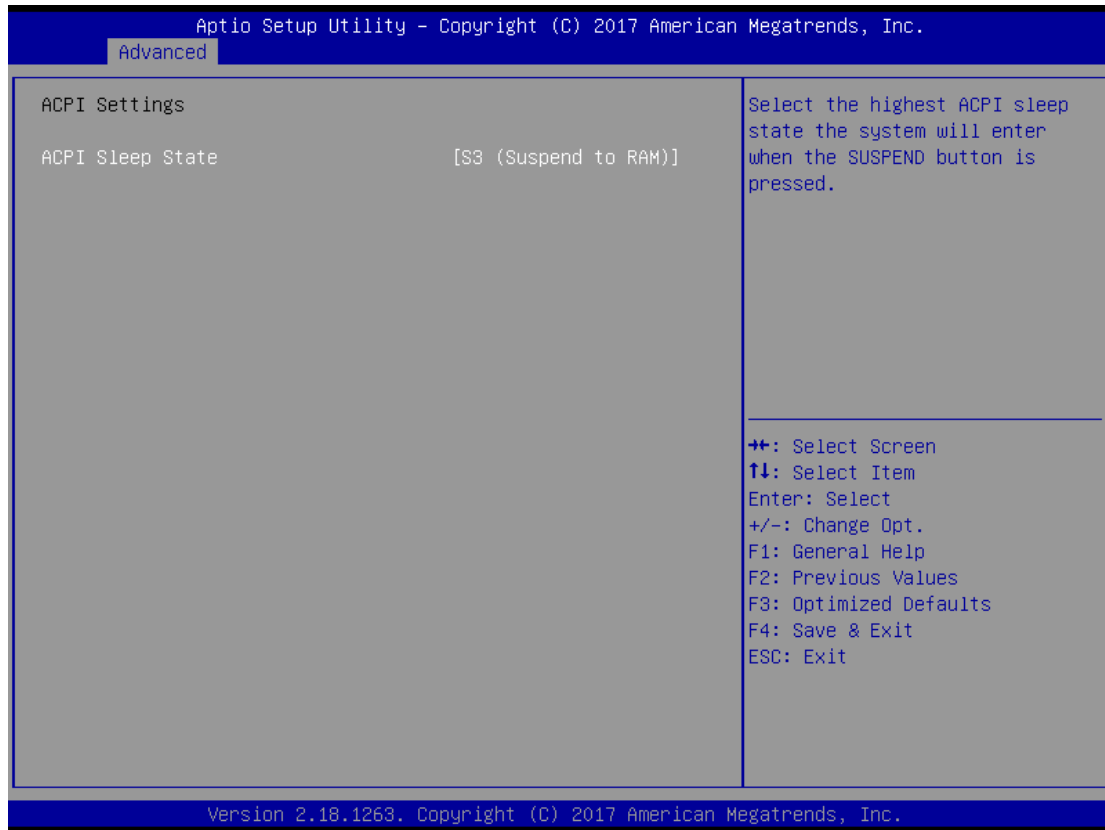
- ▶ ACPI Settings
- ▶ CPU Configurations
- ▶ SATA Configurations
- ▶ PCH-FW Configurations
- ▶ NCT6102D Super IO Configurations
- ▶ Hardware Monitor
- ▶ USB Configurations
- ▶ Utility Configurations

For items marked with “▶”, please press <Enter> for more options.



ACPI Settings

Use this screen to select options for the ACPI configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.



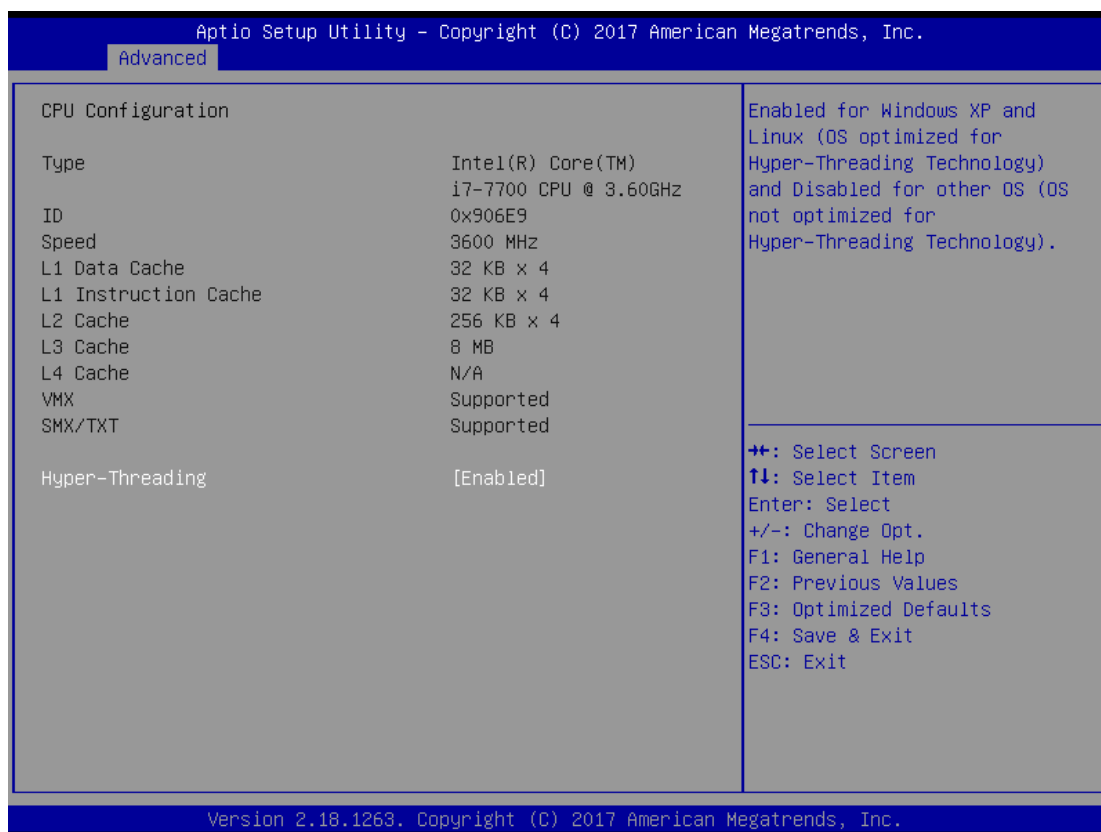
ACPI Sleep State

When the sleep button is pressed, the system will be in the ACPI sleep state.

The default is S3 (Suspend to RAM).

CPU Configurations

This screen shows the CPU version and its detailed information.

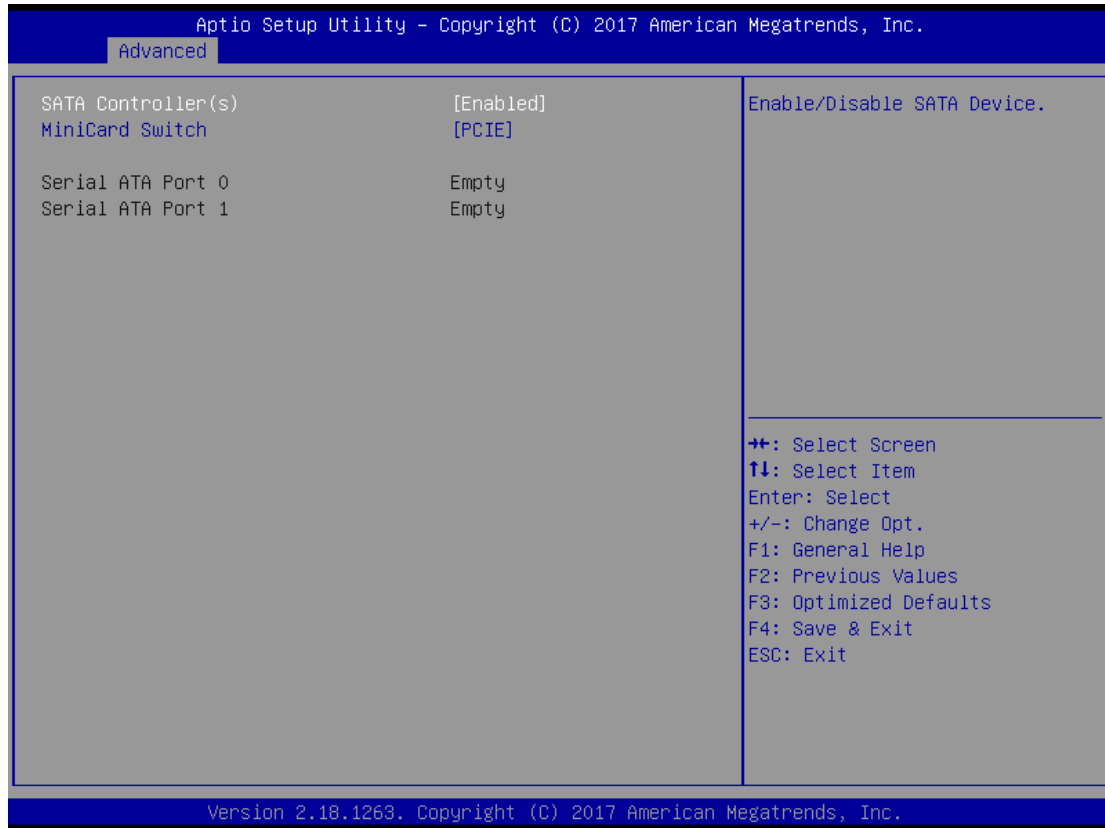


Hyper-Threading

Enable or disable Hyper-threading Technology, which allows a single physical processor to multitask as multiple logical processors. When disabled, only one thread per enabled core is enabled.

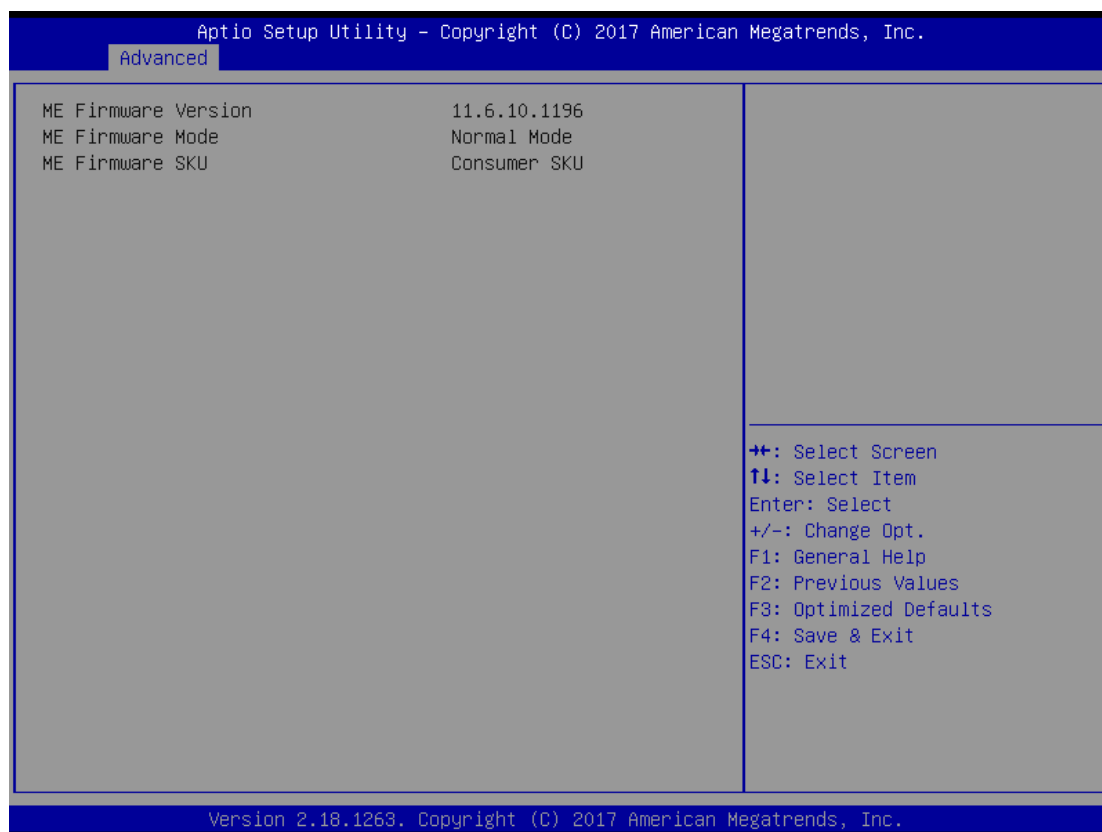
SATA Configurations

In this Configuration menu, you can see the currently installed hardware in the SATA ports. During system boot up, the BIOS automatically detects the presence of SATA devices.



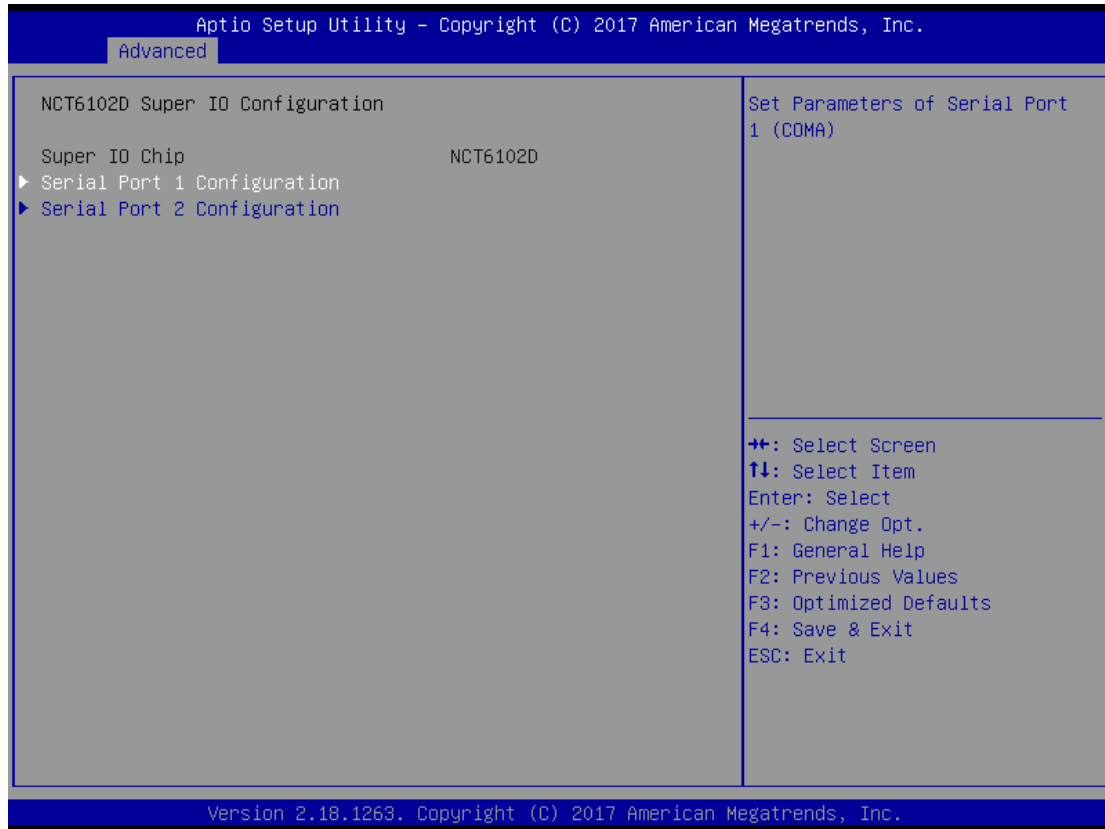
PCH-FW Configuration

This screen shows ME Firmware information.



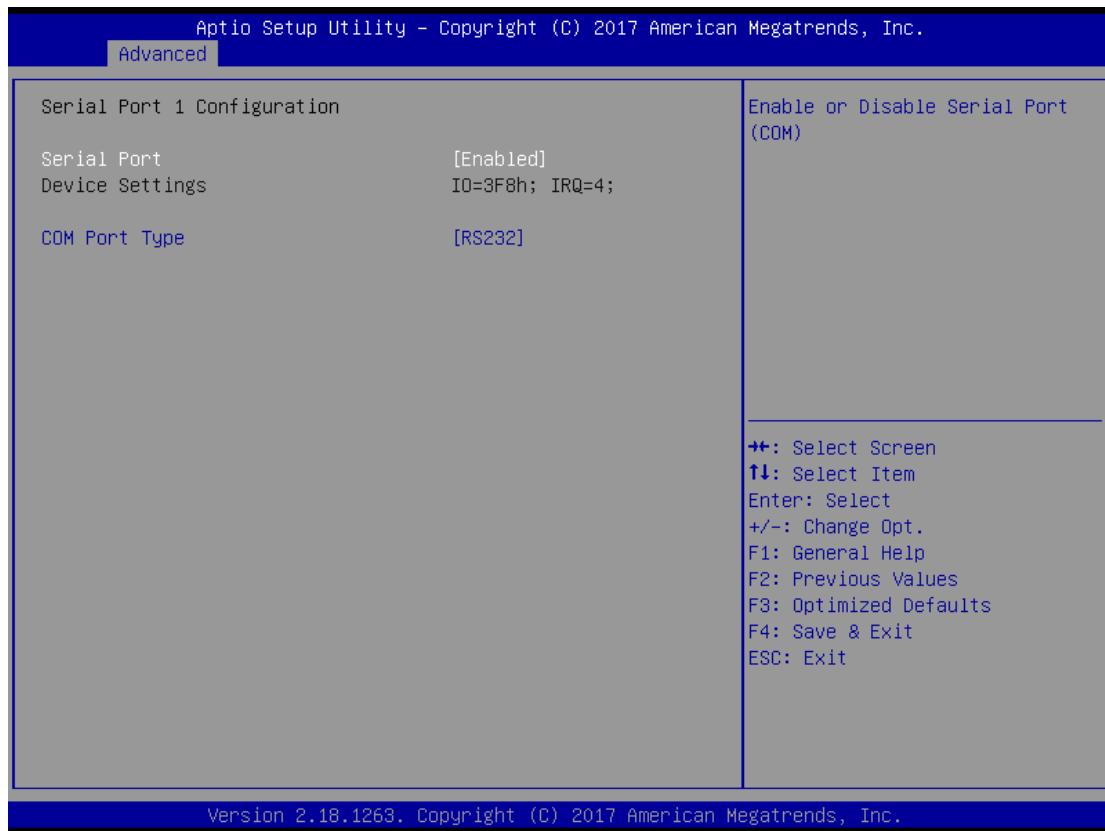
NCT6102D Super IO Configurations

Use this screen to select options for the NCT6102D Super IO Configurations, and change the value of the selected option. A description of the selected item appears on the right side of the screen. For items marked with “ ”, please press <Enter> for more options



Serial Port 1~2 (COM1~2) Configurations

Use these items to set parameters related to serial ports 1~2.



Serial Port 2

Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.

Advanced

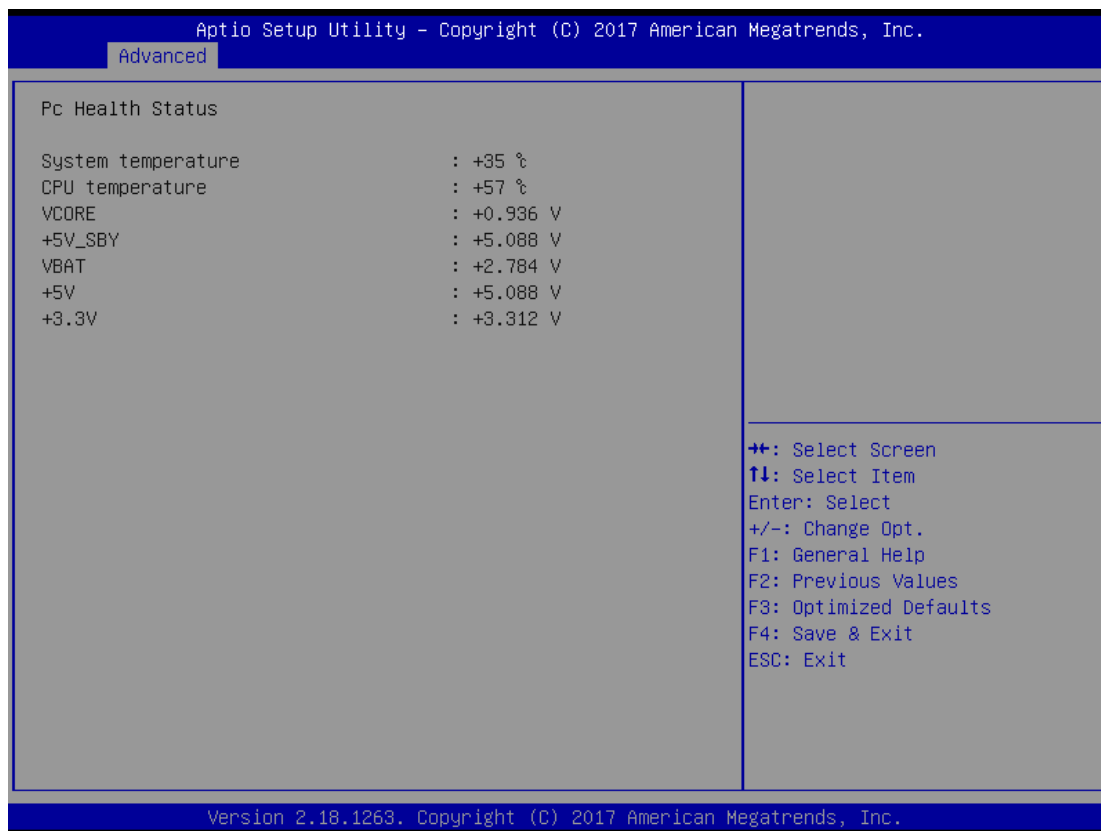
Serial Port 2 Configuration		Enable or Disable Serial Port (COM)
Serial Port	[Enabled]	
Device Settings	IO=2F8h; IRQ=3;	
COM Port Type	[RS232]	

++: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.

Hardware Monitor

This screen monitors hardware health status.



This screen displays the temperature of system and CPU, system voltages (VCORE, +3.3V, +12V and +5V).

USB Configurations

Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.	
Advanced	
USB Configuration	Mass storage device emulation type. 'AUTO' enumerates devices according to their media format. Optical drives are emulated as 'CDROM', drives with no media will be emulated according to a drive type.
USB Module Version	17
USB Controllers:	
1 XHCI	
USB Devices:	
1 Drive, 1 Keyboard	
Mass Storage Devices:	
Generic Flash Disk 8.07	[Auto]
	++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.	

USB Devices

Display all detected USB devices.

Utility Configurations

This screen is for BIOS flash utility.



BIOS Flash Utility

BIOS flash utility configuration.

4.5 Chipset Menu

The Chipset menu allows users to change the advanced chipset settings. Users can select any of the items in the left frame of the screen to go to the sub menus:

- ▶ System Agent (SA) Configurations
- ▶ PCH-IO Configurations

For items marked with “▶”, please press <Enter> for more options.



System Agent (SA) Configurations



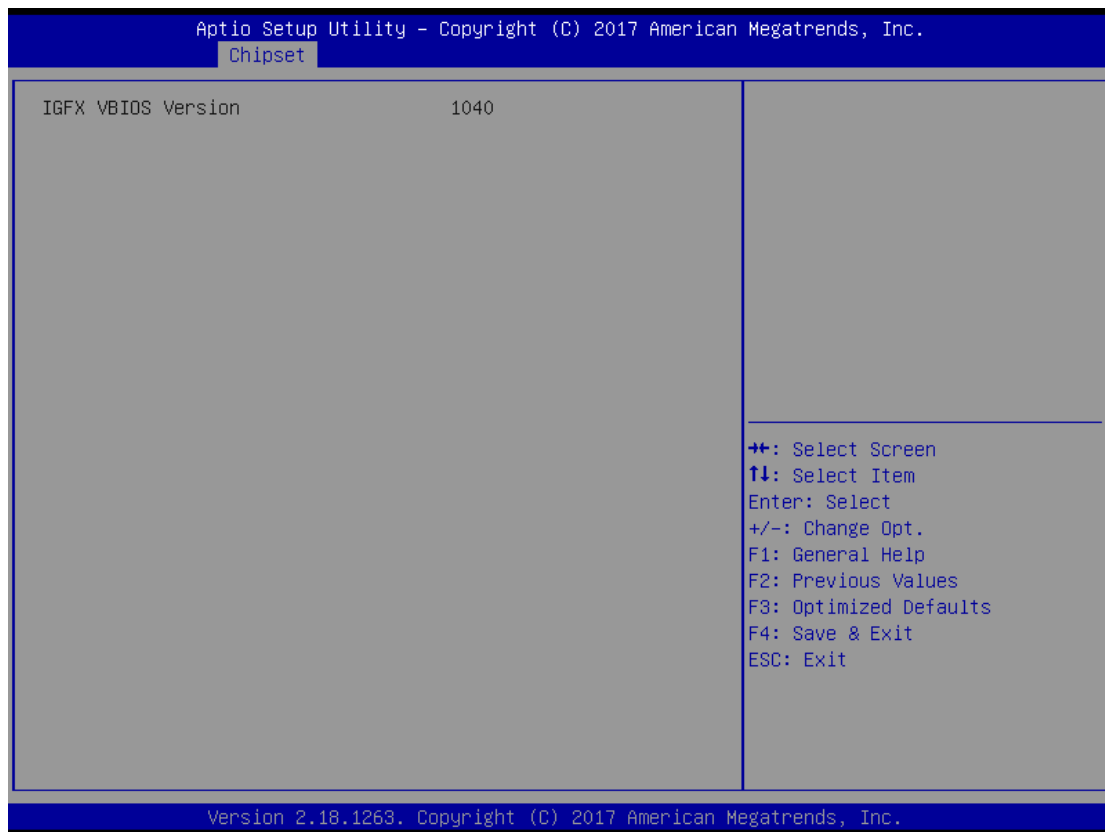
Graphics Configuration

Use this item to configure internal graphics controller.

Memory Configuration

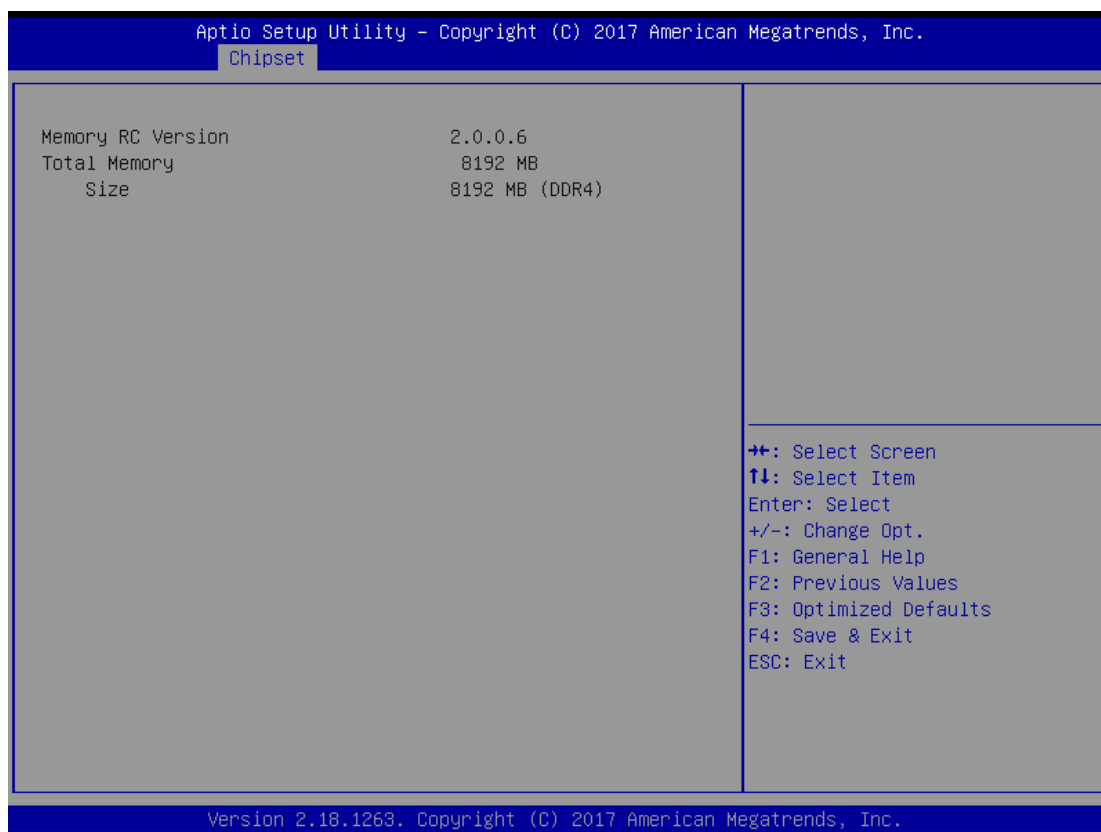
Use this item to refer to the information related to system memory.

Graphic Configurations



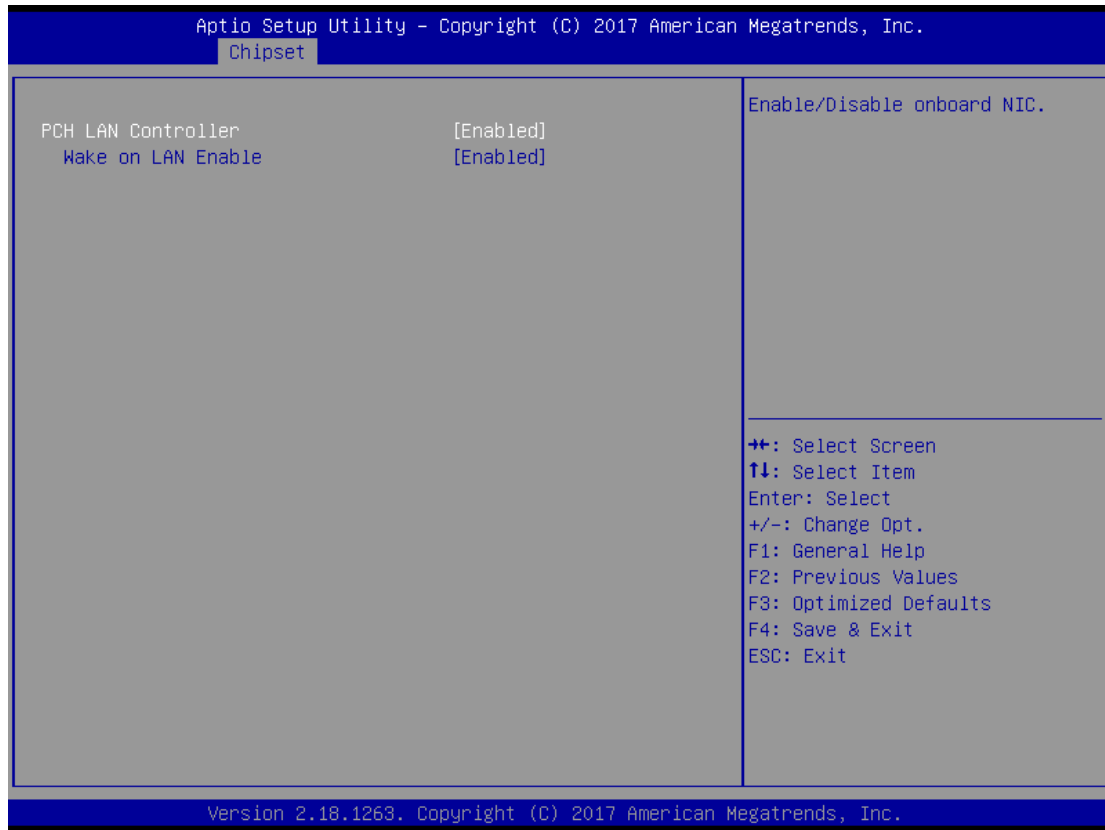
Memory Configurations

This screen shows the system memory information.



PCH-IO Configurations

This screen allows users to set PCH parameters.



Security Menu



Administrator Password

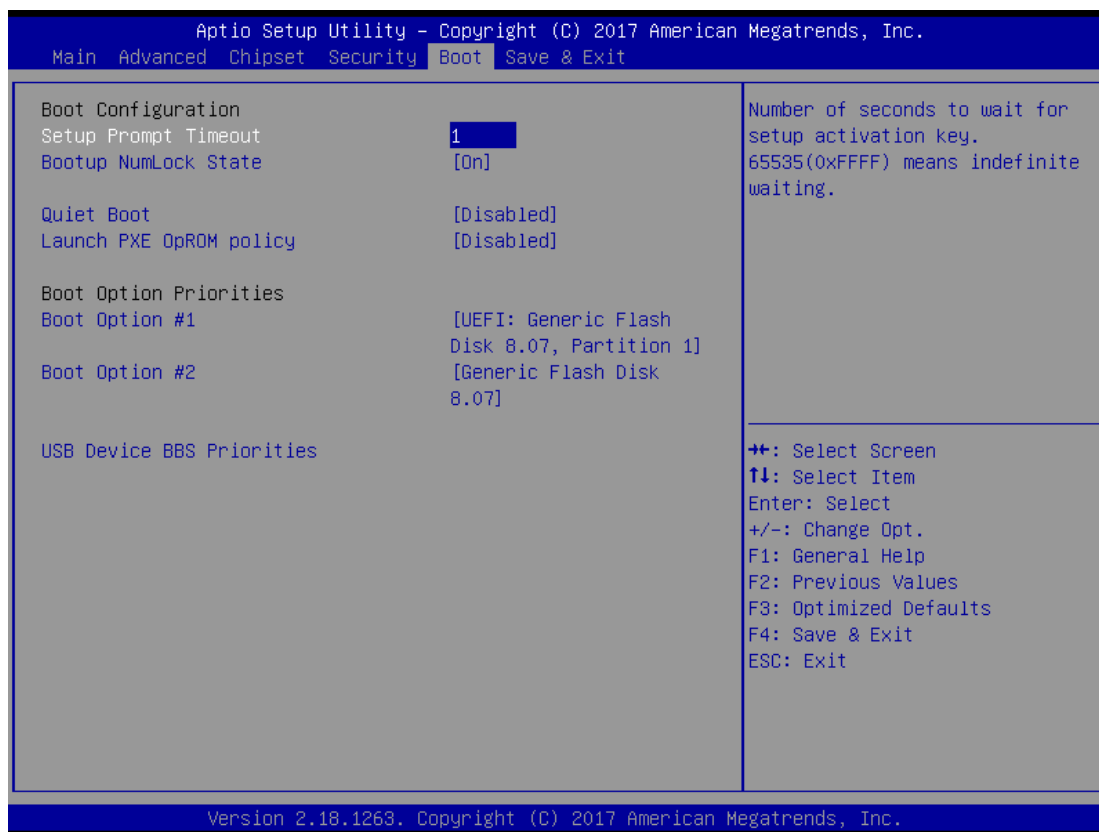
This item indicates whether an administrator password has been set (installed or uninstalled).

User Password

This item indicates whether a user password has been set (installed or uninstalled).

4.6 Boot Menu

The Boot menu allows users to change boot options of the system.



Setup Prompt Timeout

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

Bootup NumLock State

Use this item to select the power-on state for the keyboard NumLock.

Quiet Boot

Select to display either POST output messages or a splash screen during boot-up.

Launch PXE OpROM Policy

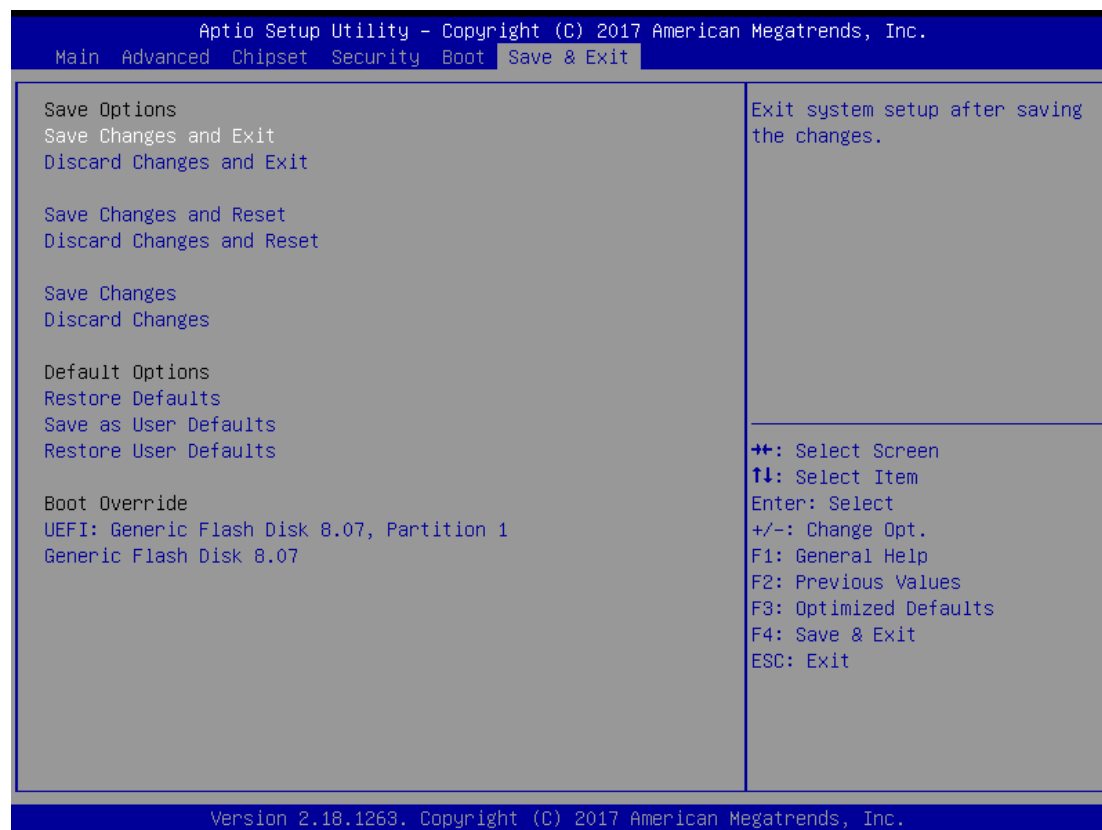
Use this item to enable or disable the boot ROM function of the onboard LAN chip when the system boots up.

Boot Option Priorities

These are settings for boot priority. Specify the boot device priority sequence from the available devices.

4.7 Save & Exit Menu

The Save & Exit menu allows users to load system configurations with optimal or fail-safe default values.



Save Changes and Exit

When users have completed the system configuration changes, select this option to leave Setup and return to Main Menu. Select Save Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to save changes and exit.

Discard Changes and Exit

Select this option to quit Setup without making any permanent changes to the system configurations and return to Main Menu. Select Discard Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to discard changes and exit.

Save Changes and Reset

When completed the system configuration changes, select this option to leave Setup and reboot the computer so the new system configurations take effect. Select Save Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to save changes and reset.

Discard Changes and Reset

Select this option to quit Setup without making any permanent changes to the system configuration and reboot the computer. Select Discard Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to discard changes and reset.

Save Changes

When completed the system configuration changes, select this option to save changes. Select Save Changes from the Save & Exit menu and press <Enter>. Select Yes to save changes.

Discard Changes

Select this option to quit Setup without making any permanent changes to the system configurations. Select Discard Changes from the Save & Exit menu and press <Enter>. Select Yes to discard changes.

Restore Defaults

It automatically sets all Setup options to a complete set of default settings when users select this option. Select Restore Defaults from the Save & Exit menu and press <Enter>.

Save as User Defaults

Select this option to save system configuration changes done so far as User Defaults. Select Save as User Defaults from the Save & Exit menu and press <Enter>.

Restore User Defaults

It automatically sets all Setup options to a complete set of User Defaults when users select this option. Select Restore User Defaults from the Save & Exit menu and press <Enter>.

Boot Override

Select a drive to immediately boot that device regardless of the current boot order.

APPENDIX A WATCHDOG TIMER

About Watchdog Timer

Software stability is major issue in most applications. Some embedded systems are not watched by human for 24 hours. It is usually too slow to wait for someone to reboot when computer hangs. The systems need to be able to reset automatically when things go wrong. The watchdog timer gives us solutions in this regard.

The watchdog timer is a counter that triggers a system to reset when it counts down to zero from a preset value. The software starts the counter with an initial value and must reset it periodically. If the counter ever reaches zero, it means the software has crashed, the system will reboot.

Sample Program

The following example enables configurations using debug tool.

Enable WDT

↓

Enable configuration:

2E 87; Un-lock super I/O

2E 87

↓

Select logic device:

2E 07

2F 08

↓

WDT device enable:

2E 30

2F 01

↓

Set timer unit:

2E F0

2F 00 ; (00: Sec; 08:Minute)

↓

Set base timer:

2E F1

2F 0A; Set reset time (where 0A (hex) = 10sec)

Disable WDT

↓

Enable configuration:

2E 87; Un-lock super I/O

2E 87

↓

Select logic device:

2E 07

2F 08

↓

WDT device disable:





2E 30

2F 00

APPENDIX B PROGRAMMABLE LED

About Programmable

LED supports four programmable LED which allows user to program the LED status. It can do as special indicator or alarm. Please refer to Driver CD for sample code and demo tool.

-  Demo
-  LIB
-  SRC
-  Readme