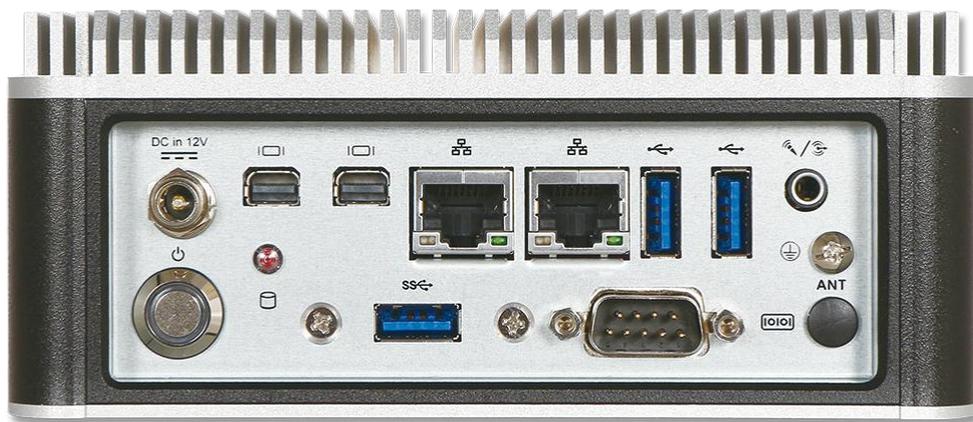


WEBS-21G0

Fan-less Embedded System



User's Manual

Version 1.1

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How to Use This Manual

The manual describes how to configure WEBS-2190 system to meet various operating requirements. It is divided into five chapters, with each chapter addressing a basic concept and operation of Fan-less Embedded System.

Chapter 1: System Overview. Present what may have in the box and give an overview of the product specifications and basic system architecture for this fan-less embedded system.

Chapter 2: System Installation. Show the definitions and locations of all the interfaces and describe a proper installation guide so that can easily configure the system.

Chapter 3: BIOS Setup Information. Specify the meaning of each setup parameters, how to get advanced BIOS performance and update new BIOS. In addition, POST checkpoint list will give users some guidelines of trouble-shooting.

Chapter 4: Important Instructions. Indicate some instructions which must be carefully followed when the fan-less embedded system is used.

Chapter 5: Frequent Asked Questions. Provide the answers for the most frequently asked questions.

The content of this manual is subject to change without prior notice. These changes will be incorporated in new editions of the document. The vendor may make supplement or change in the products described in this document at any time.

Revision History

Revision	Date	Details of Change(s)
V1.1	2021/3/09	Initial Release

Chapter 1

System Overview

1.1 Introduction

Portwell Inc., a world-leading innovator in the Industrial PC (IPC) market, announced WEBS-21G0, a fan-less intelligent embedded system featuring 15W SKUs of the 8th generation Intel® Core® processor product family (codename Whiskey Lake). Its rugged, compact design and high performance make the WEBS-21G0, a perfect solution for applications in kiosk, digital signage, in-vehicle mobile video surveillance, medical, defense and the harsh environments of factory automation.

The new rugged WEBS-21G0 is equipped with the Portwell NANO-6051, a NANO-ITX embedded board based on the 8th generation Intel® Core® processor product family. Processors available in this product family combine low power consumption with high processing power and improved performance compared to previous generation processor. The compact WEBS-21G0 embedded system also features DDR4 SO-DIMM up to 32GB supporting 2400 MT/s; two Mini DisplayPort (DP) on the rear I/O with resolution up to 4096 x 2160; one smart COM port for RS-232/422/485 selected by BIOS; one audio combo jack to support Line-out and Mic-in; and M.2 2280 key M storage. In addition, the compact 150mm x 150mm x 63mm box, WEBS-21G0, integrates a M.2 2230 key E socket interface to support WIFI, Bluetooth, making it an ideal solution as an IoT gateway.

The rugged, fan-less design makes the WEBS-21G0 durable in harsh environment applications, such as factory automation and industrial automation. The rugged and compact WEBS-21G0 supports a temperature range from 0°C to 50°C for harsh environment operations, while at the same time, its fan-less design ensures silent operation, reliability and low maintenance rate and costs. In addition, it has already passed a vibration test of 3Grms/ 10~500Hz and a shock test of 50G, assuring its solidity and reliability. In addition, the system accepts 12V input voltage.

With its superior processing power, high capability and support for 4K resolution (4096 x 2160), Portwell's WEBS-21G0 is indeed an ideal solution for high computing power and/or high 3D video/image applications.

1.2 Check List

The WEBS-21G0 package should cover the following basic items:

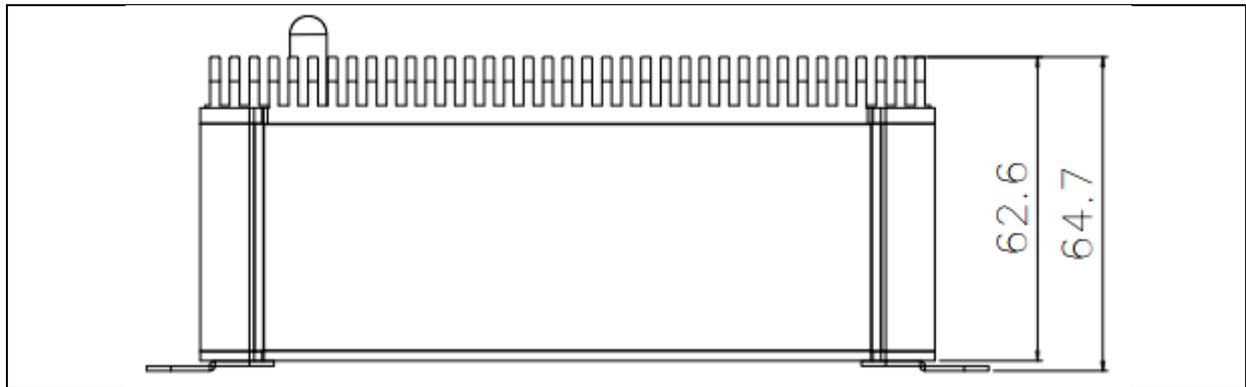
- ✓ One WEBS-21G0 Fan-less Embedded System
- ✓ One 65W AC/DC Power Adapter DC-plug with screw (Optional)
- ✓ Other Accessories

If any of these items is damaged or missing, please contact your vendor and keep all packing materials for future replacement and maintenance.

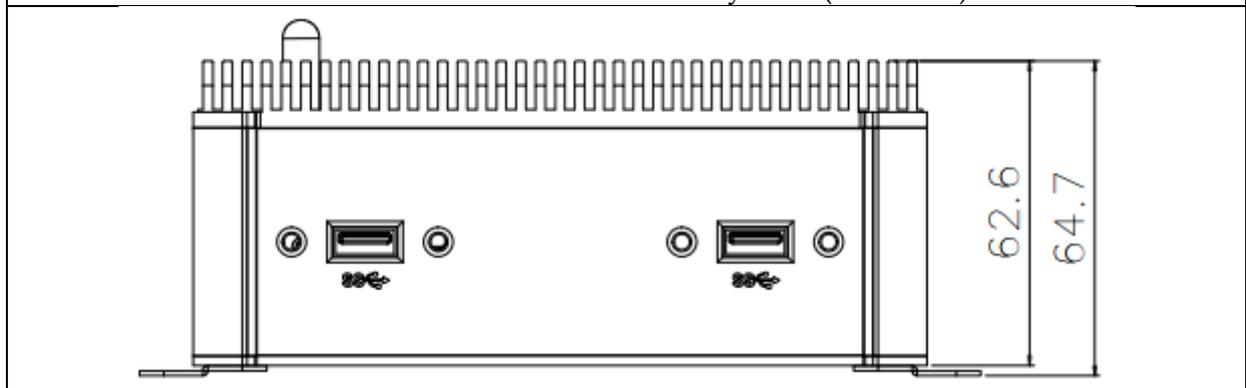
1.3 Product Specification

System	
M/B	NANO-6051
System Chipset	Intel® Whiskey Lake - U SoC
CPU	Intel® Core® i5-8365UE (15W) in FCBGA1528 package 1.6 GHz up to 4.1 GHz /4C/8T. 6MB Cache. Intel® Core® i3-8145UE (15W) in FCBGA1528 package 2.2 GHz up to 3.9GHz /2C/4T. 4MB Cache..
BIOS	AMI uEFI BIOS (SPI ROM)
System Memory	One 260-pin DDR4 non-ECC SO-DIMM supports up to 32GB
Storage	1x M.2 key M 2280
Watchdog Timer	Programmable by embedded controller
H/W Status Monitor	-Temperature (CPU & System) -Voltage (CPU Vcore, 12V, 5V, 3.3V, 1.35V)
Expansion	1x M.2 key E 2230 for wireless module
External I/O	
Series Ports	1x RS-232/422/485 COM Port (selected by BIOS)
Display	2x mini DP
USB	3x USB 3.0 (Optional kit: additional 2x USB 3.0)
Audio	Audio Combo Jack Lin-out/Mic-in
LAN	2x Gigabit Ethernet (Intel® I219LM + I210AT)
Other	1x Antenna hole for WIFI/Bluetooth module
Power Supply Unit	
Power Supply	DC 12V
Environment	
Operating Temperature	0°C to 50°C
Storage Temperature	-20°C to 85°C
Relative Humidity	95% @ 40°C, non-condensing
Operating Vibration	3Grms/10~500Hz, IEC 60068-2-6
Operating Shock	50G, 11 msec, IEC 60068-2-27
Mechanical	
Dimension (WxDxH)	150x 150 x 63 mm; 5.9" x 5.9" x 2.5"
Weight	2kg
Mounting	Wall and DIN Rail mounting

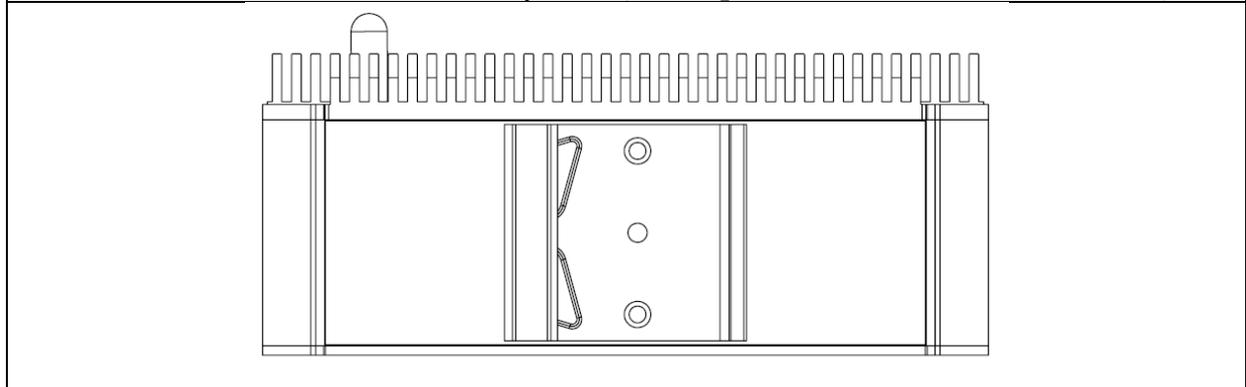
1.4 Mechanical Dimension



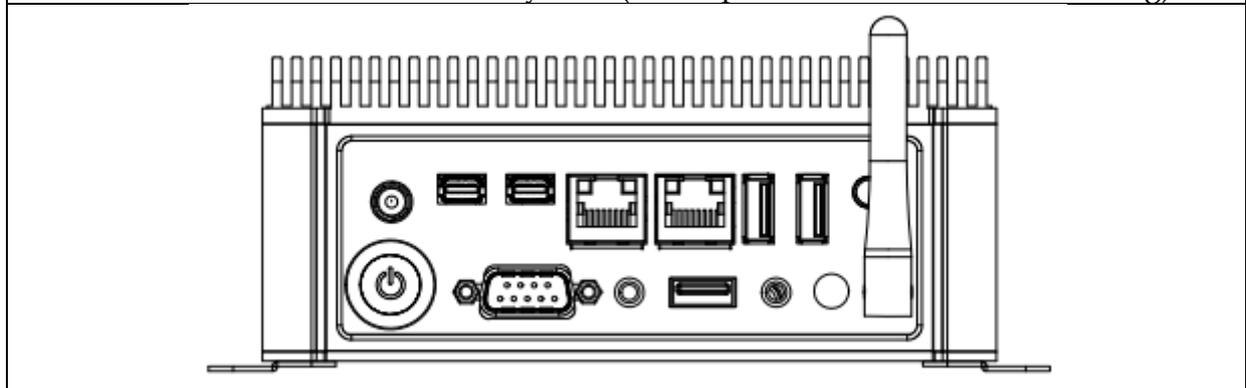
Front view of the WEBS-21G0 system (standard)



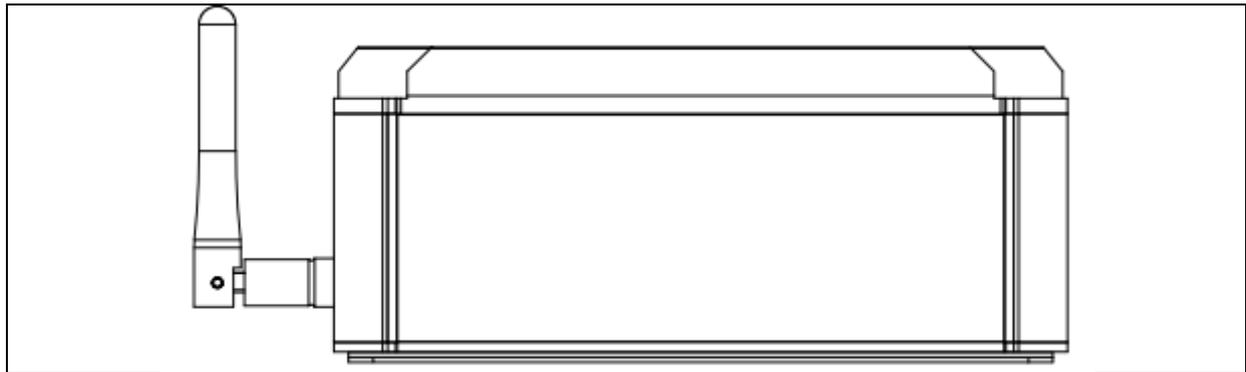
Front view of the WEBS-21G0 system (with optional kit: addition 2x USB 3.0)



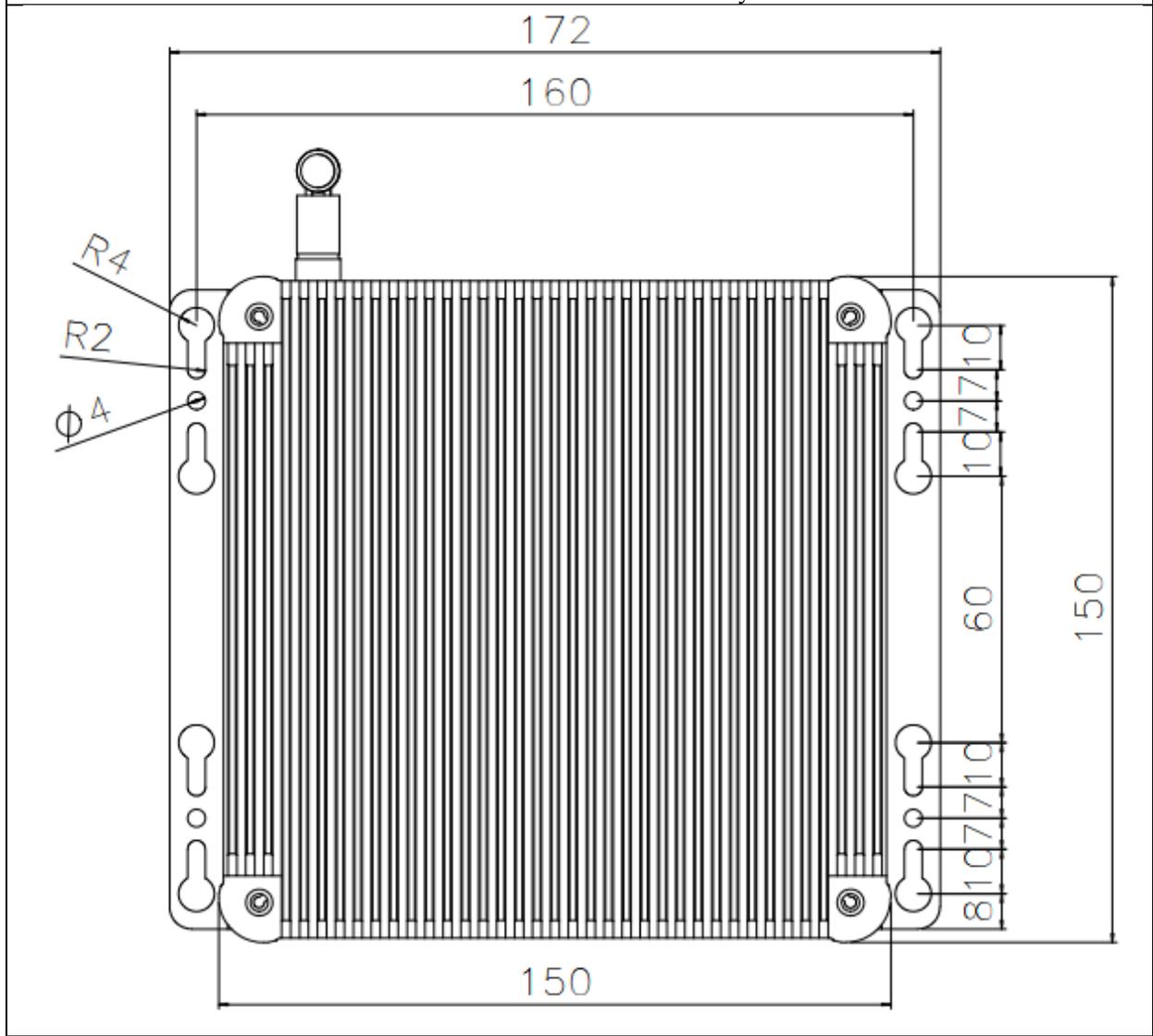
Front view of the WEBS-21G0 system (with optional kit: DIN-Rail mounting)



Rear view of the WEBS-21G0 system



Side view of the WEBS-21G0 system



Top view of the WEBS-21G0 system

Chapter 2 System Installation

This chapter provides you with instructions to set up your system. Definitions and locations of all the interfaces are described so that you can easily configure your system. For more detailed PIN assignment and jumper setting, please refer to user's manual of NANO-6051.

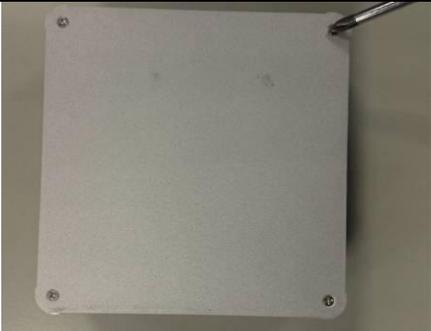
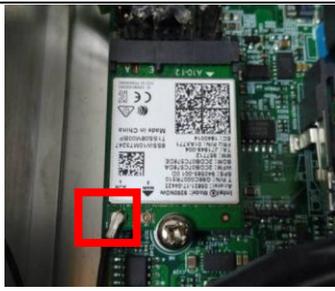
2.1 Storage M.2 Key M 2280 Device Installation

It's easy to install and maintenance the 1x M.2 2280 by just open the back cover.

<p>Step 1. Loosen the 4 screws of the back cover</p>	<p>Step 2. Take out the back cover</p>
	
<p>Step 3. Assemble the M.2 2280 card and make sure it has been screwed</p>	<p>Step 4. Tighten the 4 screws of the back cover</p>
 <p>M3x6L</p>	

2.2 M.2 Key E 2230 Device Installation

It is easy to install and maintain the 1x M.2 Key E 2230 device by just opening the back cover.

<p>Step 1. Loosen the 4 screws of the back cover</p>	<p>Step 2. Take out the back cover</p>
	
<p>Step 3. Assemble the Half-size Mini-PCIe card and make sure it has been screwed</p>	<p>Step 4. Install the SMA cable onto main connector of module</p>
 <p>M3x6L</p>	
<p>Step 4. Put the Antenna cable through the antenna hole</p>	<p>Step 5. Install the Antenna</p>
	
<p>Step 6. Position the back cover</p>	<p>Step 7. Tighten the 4 screws of the back cover</p>
	

2.3 DIN Rail Mounting Device Installation

It is easy to install and maintain the Din Rail mounting device by just opening the back cover.

<p>Step 1. Loosen the 4 screws of the back cover</p>	<p>Step 2. Take out the back cover</p>
	
<p>Step 3. Take out the front side cover</p>	<p>Step 4. Prepare the Din Rail mounting side cover</p>
	
<p>Step 5. Assemble the new side cover with DIN Rail mounting device</p>	<p>Step 6. Position the back cover</p>
	
<p>Step 7. Tighten the 4 screws of the back cover</p>	<p>Step 8. Clip the DIN Rail onto the device and make sure it has been locked tightly</p>
	

2.4 Getting Started

It is easy to get the system started.

Step 1. Make sure the power supply (12V) is connected properly



Step 2. Press the power button to turn on the system



2.5 I/O Interfaces

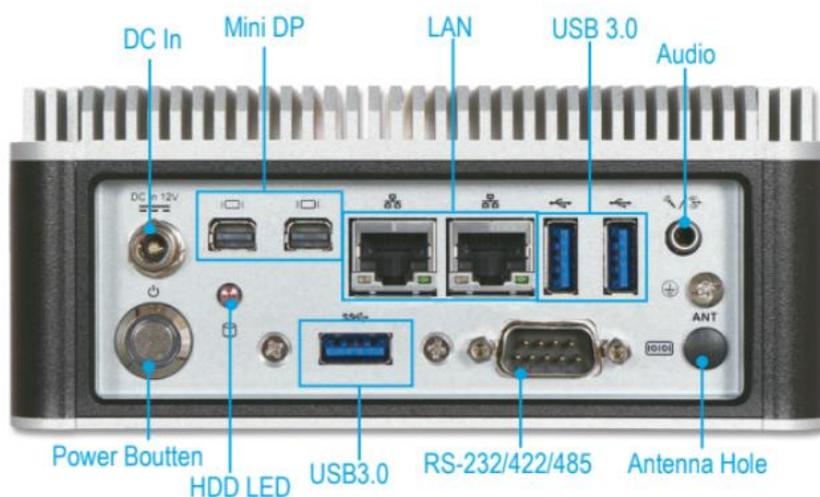
2.5.1 Front View (Standard)



2.5.2 Front View (Optional Kit: Additional 2x USB 3.0)



2.5.3 Rear View



DC in: (12V)

Using the provided DC source to connect to the system

Power Button:

Press the power button to turn ON/OFF the system

HDD LED:

Shows real-time read and write activity of your HDD/SSD as a small blinking indicator

Mini DP:

Mini DP (Display Port) display output

LAN:

Two Gigabit Ethernet (10/100/1000 Mbits/sec) LAN ports by using Intel I219LM + I210AT Ethernet Controller

USB 3.0:

Three USB 3.0 (Universal Serial Bus) port

RS-232/422/485:

*Note: RS-232/422/485 configuration is determined by BIOS setting. Check BIOS setting for details.

PIN No.	Signal Description	PIN No.	Signal Description
1	DCD#/485D-/422T-	2	RXD#/485D+/422T+
3	TXD#/422R+	4	DTR#/422R-
5	Ground	6	DSR#
7	RTS#	8	CTS#
9	RI#	10	N/C

Audio:

Combo connector for Line-Out and Min-In

Antenna Hole:

Antenna holes for M.2 wireless card

Chapter 3

BIOS Setup Information

WEBS-21G0 system adopts NANO-6051 mother board. The following section describes the BIOS setup program. The BIOS setup program can be used to view and change the BIOS settings for the module. Only experienced users should change the default BIOS settings.

3.1 Entering Setup

The following section describes the BIOS setup program. The BIOS setup program can be used to view and change the BIOS settings for the module. Only experienced users should change the default BIOS settings.

BIOS Setup

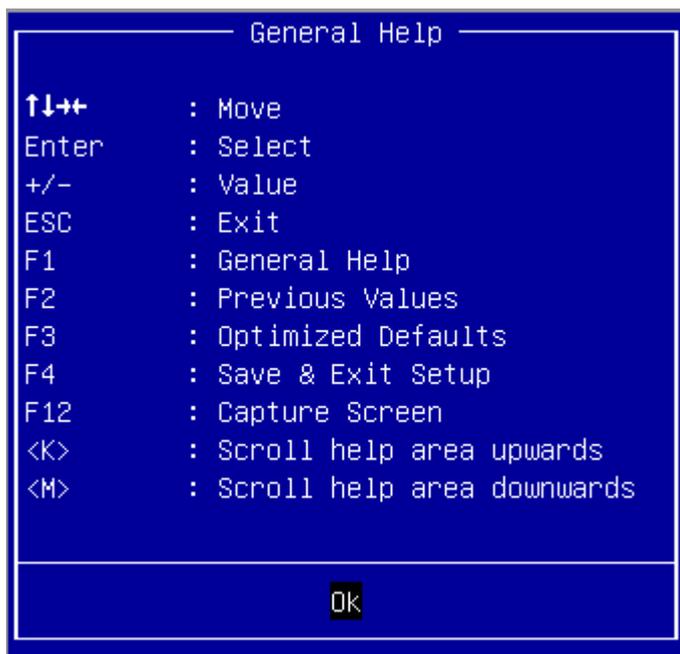
Power on the computer and the system will start POST (Power on Self Test) process. When the message below appears on the screen, press <Delete> or <ESC> key will enter BIOS setup screen.

Press <ESC > or <Delete> to enter SETUP

If the message disappears before responding and still wish to enter Setup, please restart the system by turning it OFF and On or pressing the RESET button. It can be also restarted by pressing <Ctrl>, <Alt>, and <Delete> keys on keyboard simultaneously.

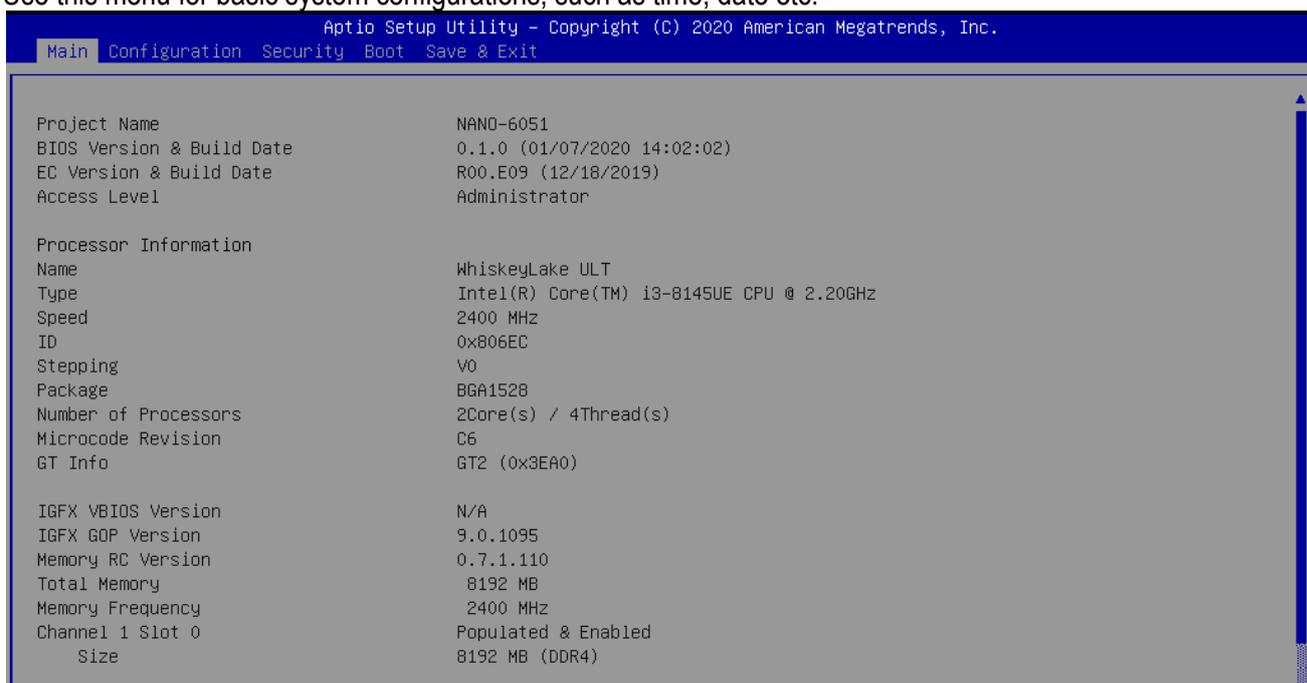
Press <F1> to Run General Help or Resume

The BIOS setup program provides a General Help screen. The menu can be easily called up from any menu by pressing <F1>. The Help screen lists all the possible keys to use and the selections for the highlighted item. Press <Esc> to exit the Help Screen.



3.2 Main

Use this menu for basic system configurations, such as time, date etc.



```

PCH Information
Name                CNL PCH-LP
PCH SKU             (U) Premium SKU
Stepping            D0
ChipsetInit Base Revision 7
ChipsetInit OEM Revision 68
Package             Not Implemented Yet
TXT Capability of Platform/PCH  Unsupported
Production Type     Production

Dual Output Fast Read support  Not supported
Read ID/Status Clock Freq      48 MHz
Write and Erase Clock Freq     48 MHz
Fast Read Clock Freq           48 MHz
Fast Read support              Supported
Read Clock Freq                30 MHz
Number of Components           1 Component
SPI Component 0 Density        16 MB

ME FW Version              12.0.45.1509
ME Firmware SKU            Corporate SKU

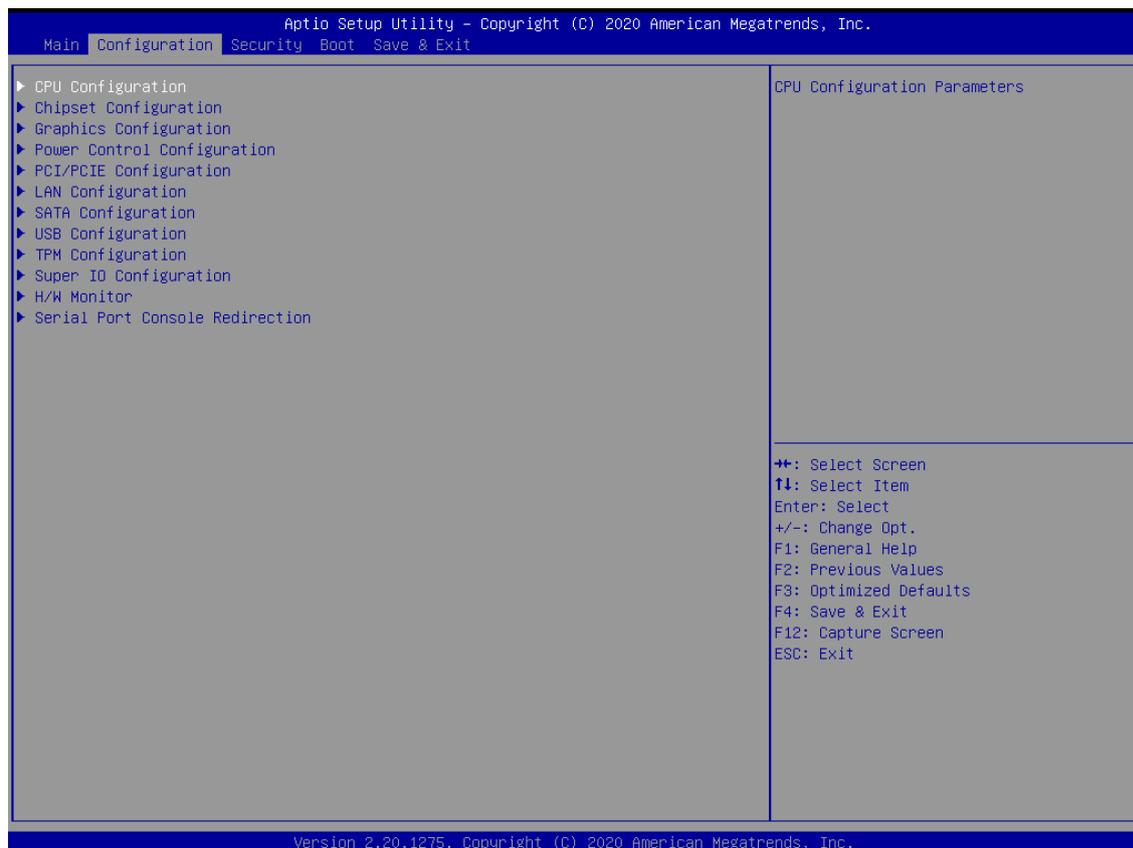
System Date                [Mon 02/10/2020]
System Time                [14:23:02]
    
```

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Feature	Description	Options
System Date	The date format is <Day>, <Month> <Date> <Year>. Use [+] or [-] to configure system Date.	
System Time	The time format is <Hour> <Minute> <Second>. Use [+] or [-] to configure system Time.	

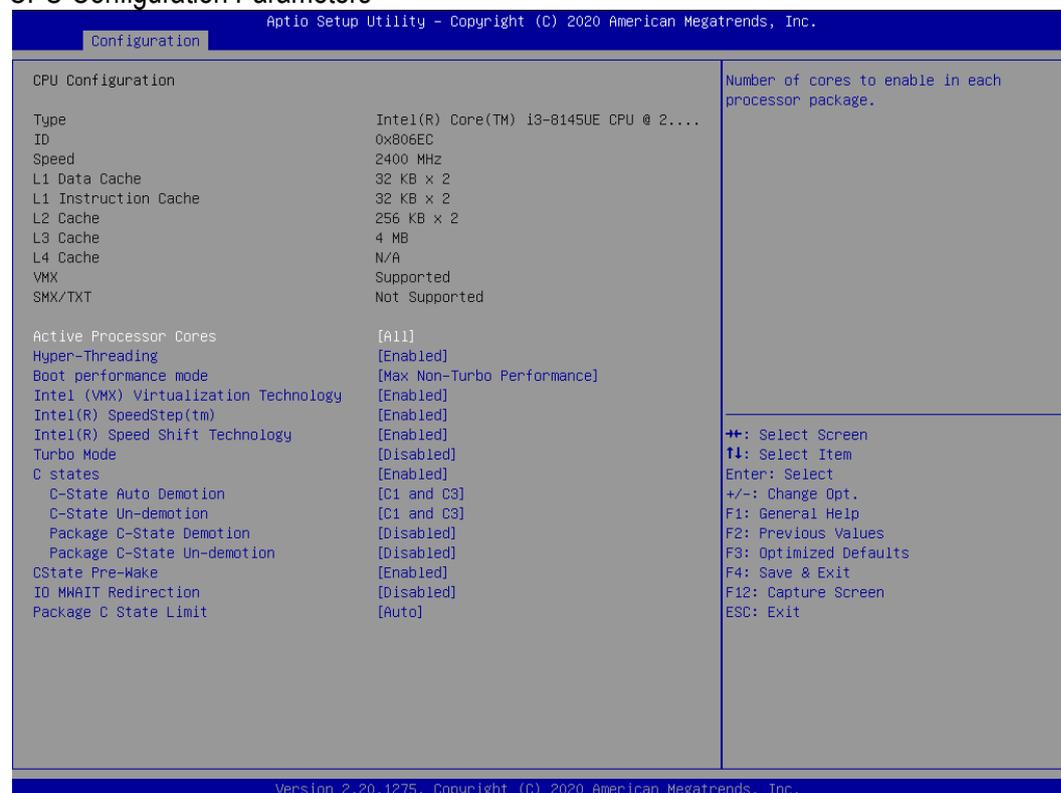
3.3 Configuration

Use this menu to set up the items of special enhanced features



CPU Configuration

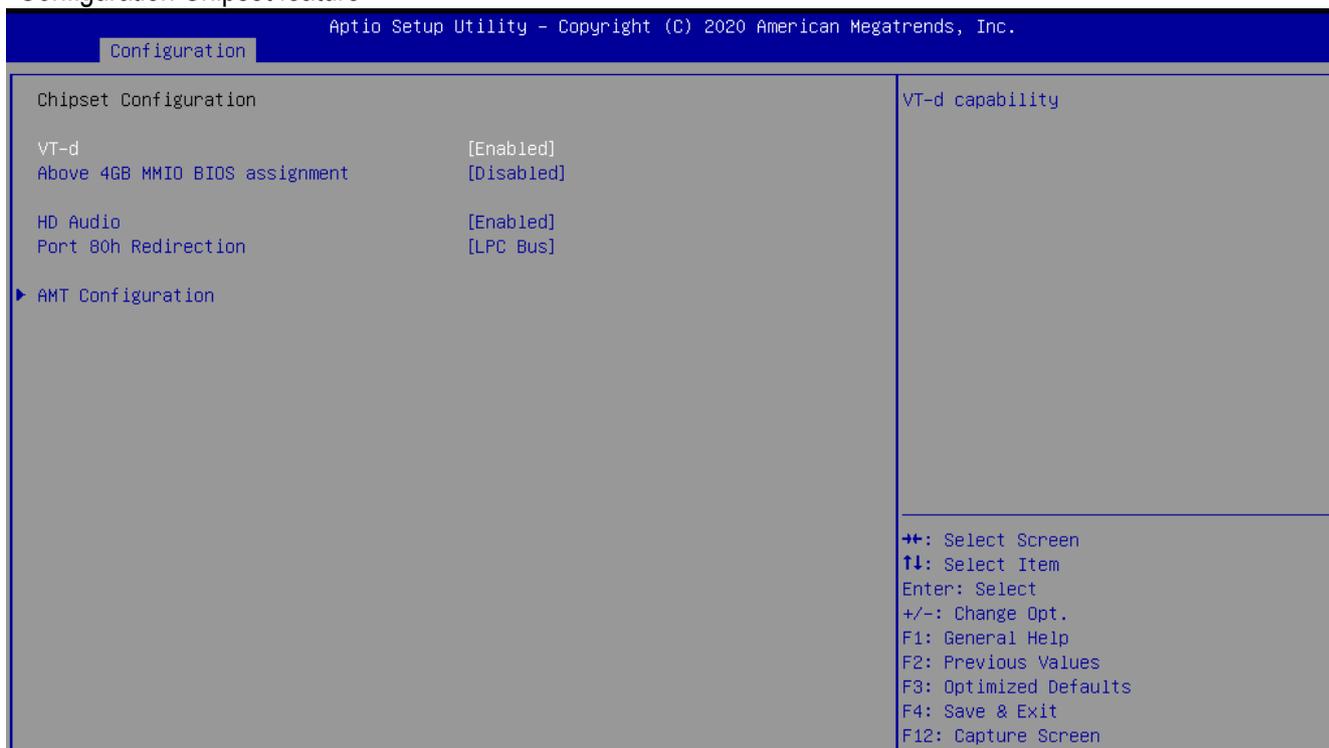
CPU Configuration Parameters



Feature	Description	Options
Active Processor Cores	Number of cores to enable in each processor package.	★ All, 1
Hyper-Threading	Enable or Disable Hyper-Threading Technology	★ Enabled, Disabled
Boot performance mode	Select the performance state that the BIOS will set starting from reset vector	★ Max Non-Turbo Performance, Max Battery, Turbo Performance
Intel (VMX) Virtualization Technology	When enabled, a VMM can utilize the additional hardware capabilities provided by Vander pool Technology.	★ Enabled, Disabled
Intel® Speed Step™	Allows more than two frequency ranges to be supported.	★ Enabled, Disabled
Intel® Speed Shift Technology	Enable/Disable Intel® Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow for hardware controlled P-states	★ Enabled, Disabled
Turbo Mode	Enable/Disable processor Turbo Mode (requires Intel Speed Step or Intel Speed Shift to be available and enabled)	★ Disabled, Enabled
C states	Enable/disable CPU Power Management. Allows CPU to go to C states It's not 100% utilized	★ Enabled, Disabled
C-State Auto Demotion	Configure C-State Auto Demotion	★ C1 and C3, Disable, C1, C3
C-State Un-demotion	Configure C-State Un-demotion	★ C1 and C3, Disable, C1, C3
Package C State Demotion	Package C-State Demotion	★ Disabled, Enabled
Package C State Un-demotion	Package C-State Un-demotion	★ Disabled, Enabled
CState Pre-Wake	Disable – Sets bit 30 of POWER_CTL MSR(0x1FC) to 1 to disable the Cstate Pre-Wake	★ Enabled, Disabled
IO MWAIT Redirection	When set, will map IO_read instructions sent to IO registers PMG_IO_BASE_ADDRBASE+offset to MWAIT(offset)	★ Disabled, Enabled
Package C State Limit	Maximum Package C State Limit Setting. Cpu Default: Leaves to Factory default value. Auto: Initializes to deepest available Package C States Limit	★ Auto, C0/C1,C2,C3, C6,C7, C7S,C8,C9,C10,Cp u Default,

Chipset Configuration

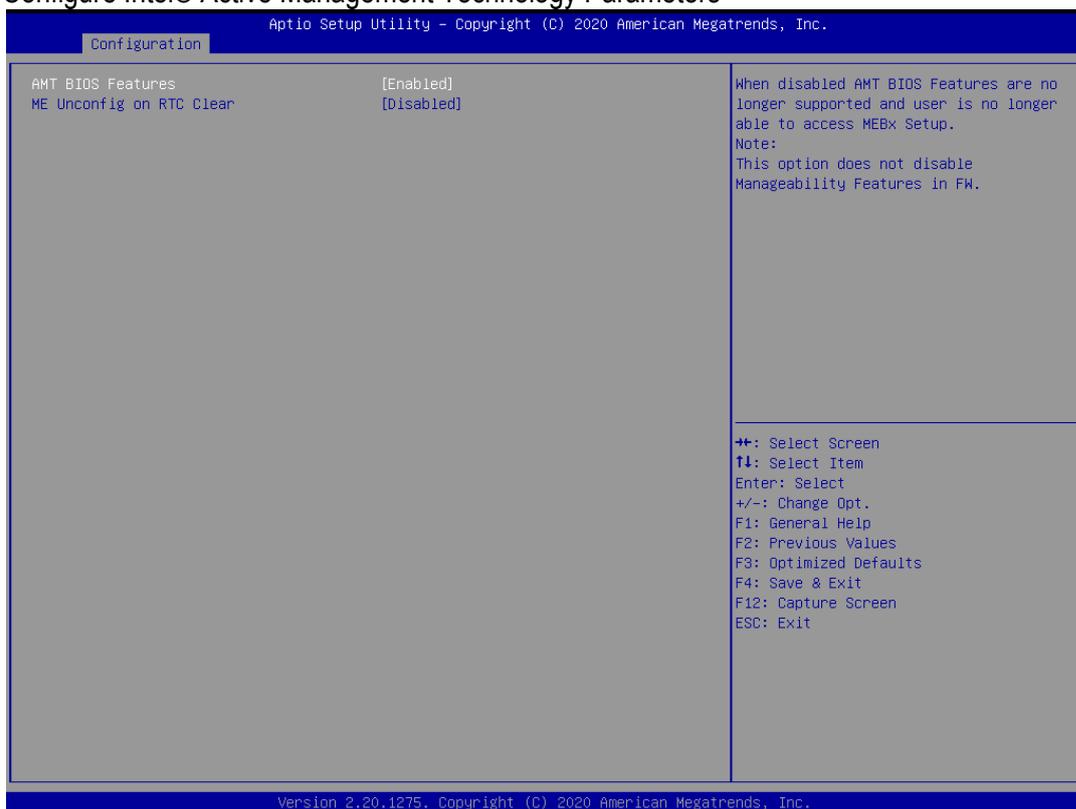
Configuration Chipset feature



Feature	Description	Options
VT-d	VT-d Capability	★ Enabled, Disabled
Above 4GB MMIO BIOS assignment	Enable/Disable above 4GB MemoryMappedIO BIOS assignment This is enabled automatically when Aperture Size is set to 2048MB	★ Disabled, Enabled
HD Audio	Control Detection of the HD-Audio device	★ Enabled, Disabled
Port 80h Redirection	Control where the Port 80h cycles are sent	★ LPC Bus, PCIE Bus

AMT Configuration

Configure Intel® Active Management Technology Parameters



Feature	Description	Options
AMT BIOS Features	When disable AMT BIOS Features are no longer supported and user is no longer able to access MEBx Setup. Note: This option does not disable Manageability Features in FW	★ Enabled, Disabled
ME Unconfig on RTC Clear	When Disable ME will not be unconfigured on RTC Clear	★ Disabled, Enabled

Graphics Configuration

Configuration Graphics Settings

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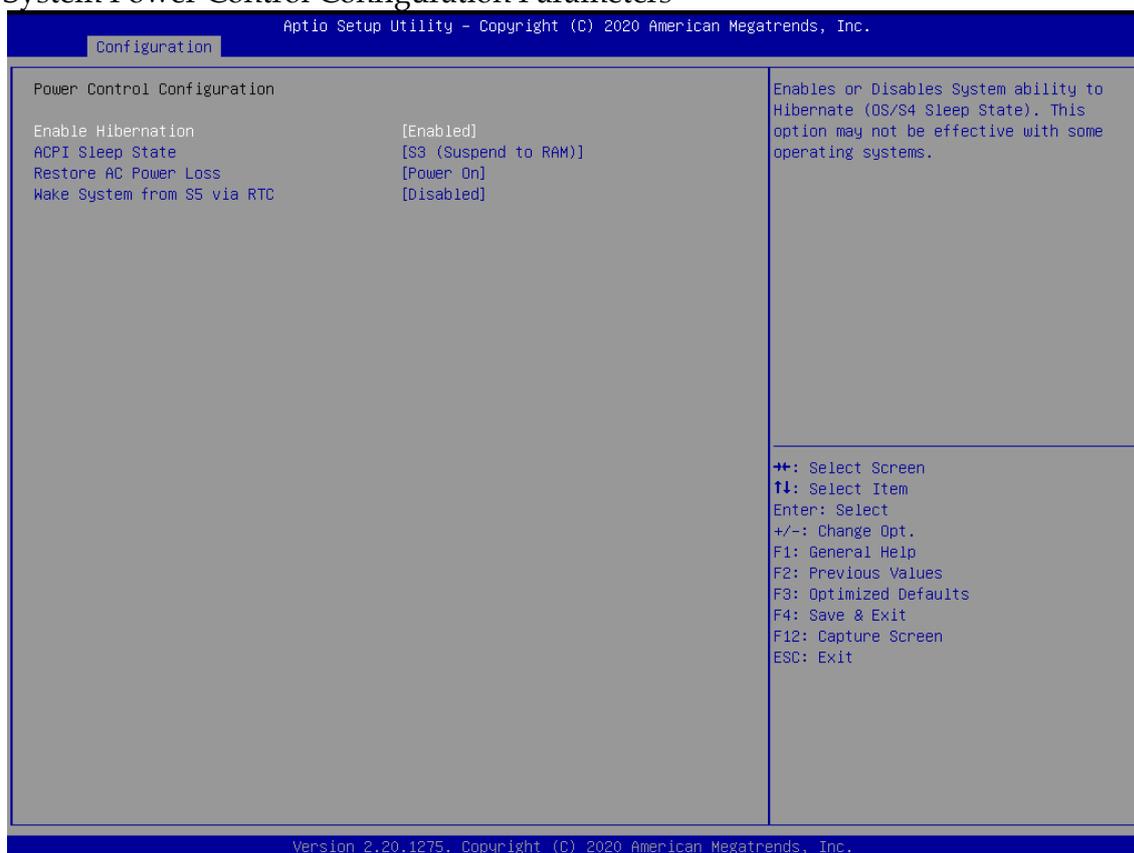
Configuration	
<p>Graphics Configuration</p> <p>Primary Display [Auto] Internal Graphics [Auto] DVMT Pre-Allocated [32M] DVMT Total Gfx Mem [256M]</p>	<p>Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx.</p> <p> ++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit F12: Capture Screen ESC: Exit </p>

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Feature	Description	Options
Primary Display	Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx.	★Auto, IGFX, PEG, PCI
Internal Graphics	Keep IGFX enable based on the setup options.	★Auto, Disable, Enable
DVMT Pre-Allocated	Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.	★32M,0M,64M, 4M, 8M,12M,16M,20M,24M, 28M,32M,/F7,36M,40M,44M,48M,52M,56M,60M
DVMT Total Gfx Mem	Select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device	★256M, 128M, MAX

Power Control Configuration

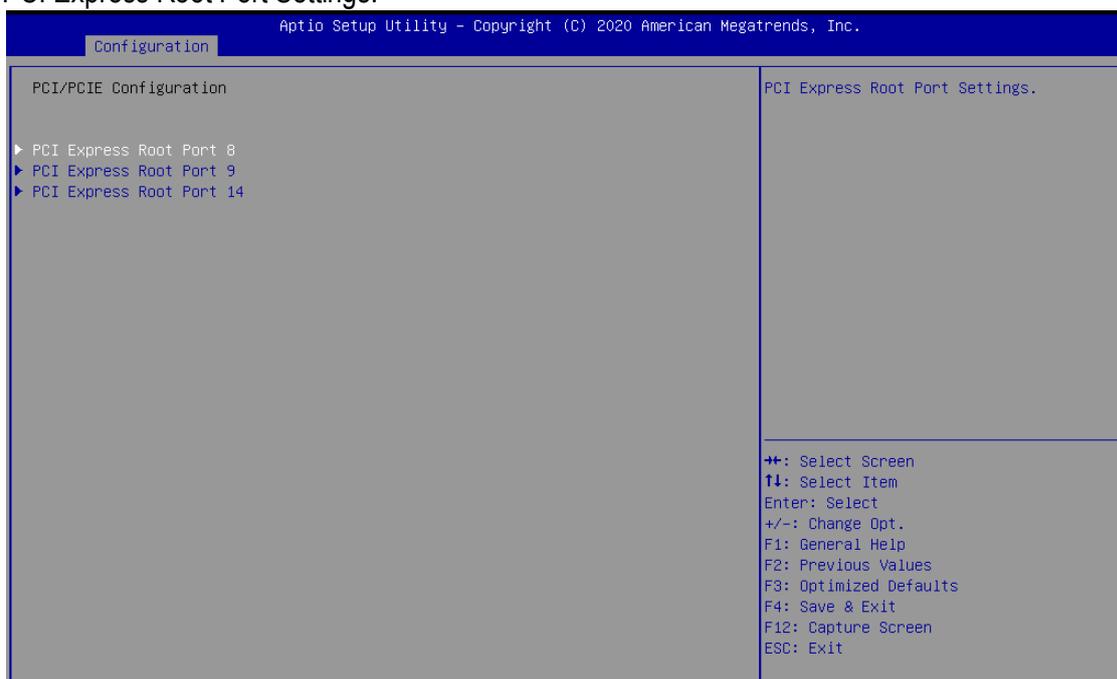
System Power Control Configuration Parameters



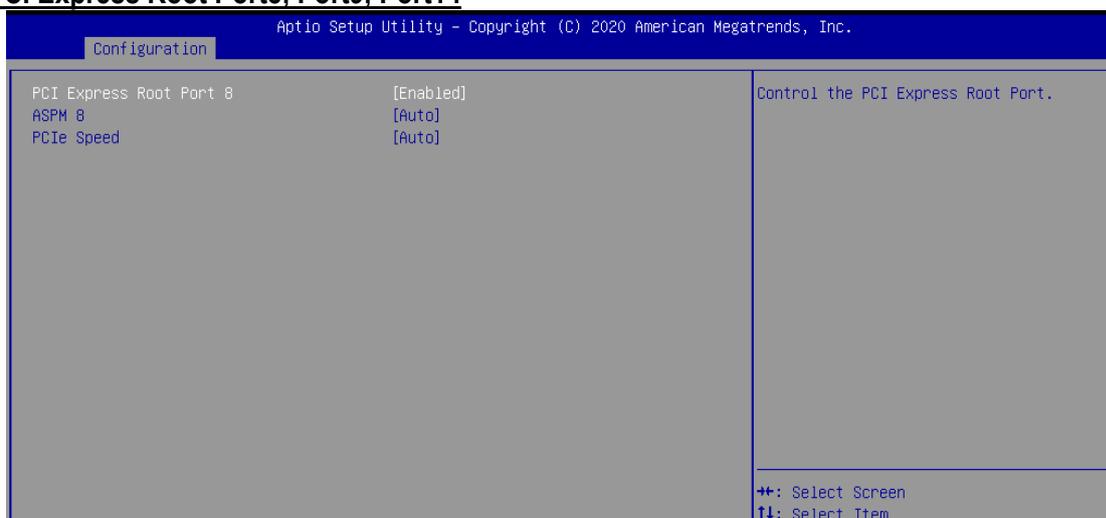
Feature	Description	Options
Enable Hibernation	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some operating systems.	★Enabled , Disabled
ACPI Sleep State	Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.	★S3 (Suspend to RAM), Suspend Disabled
Restore AC Power Loss	Specify what state to go to when power is re-applied after a power failure (G3 state)	★Power On ,Power Off ,Last State
Wake System from S5 via RTC	Enable or disable System wake on alarm event. When enabled, System will wake on the hr::min::sec Specified/programmed by the Tools from OS	★Disabled, Enabled

PCI/PCIE Configuration

PCI Express Root Port Settings.



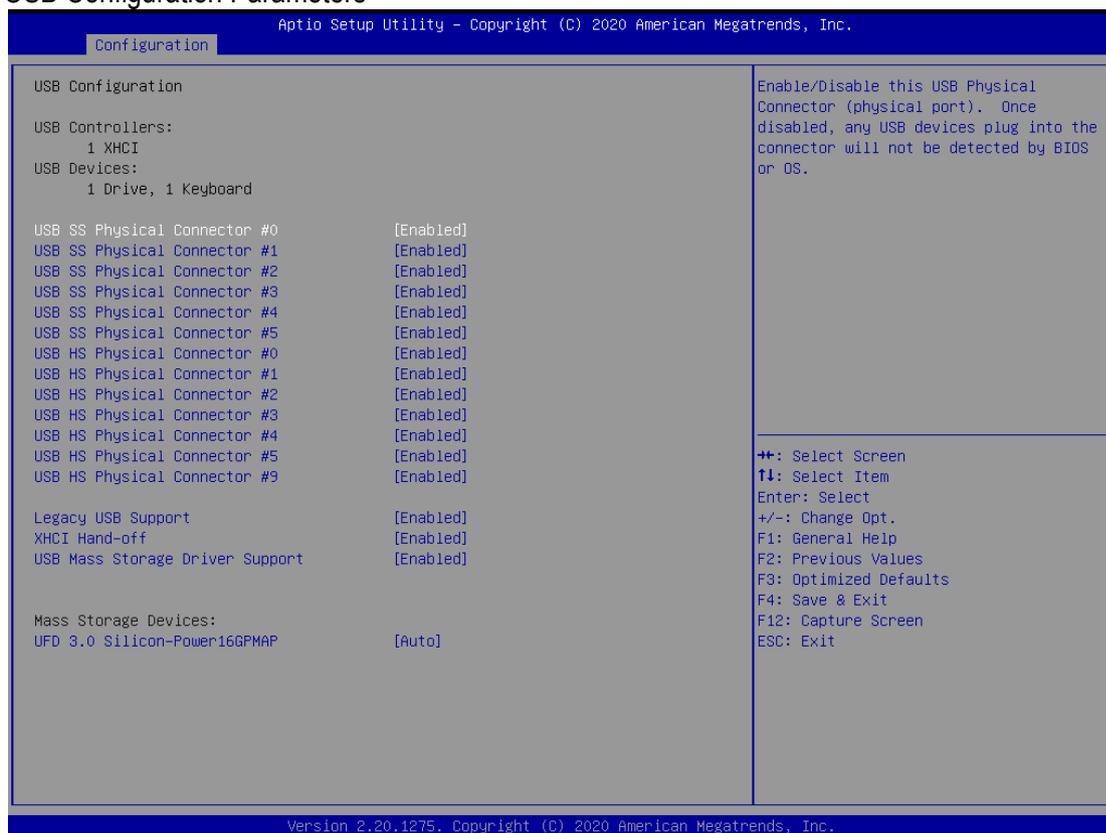
PCI Express Root Port8, Port9, Port14



Feature	Description	Options
PCI Express Root Port 8/9/14	Control the PCI Express Root Port.	★Enabled , Disabled
ASPM 8/9/14	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO-BIOS auto configure DISABLE – Disables ASPM	★Auto ,Disabled, L0s, L1, L0sL1,
PCIe Speed	Configure PCIe Speed	★Auto, Gen1, Gen2, Gen3

USB Configuration

USB Configuration Parameters



Feature	Description	Options
USB SS/HS Connector #0~5,#9	Enable/Disable this USB Physical Connector. Once disabled, any USB devices plug into the connector will not be detected by BIOS or OS	★ Enabled Disabled
Legacy USB Support	Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI application	★ Enabled Disabled, Auto
XHCI Hand-off	This is a workaround for Oses without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver	★ Enabled Disabled
USB Mass Storage Driver Support	Enable/Disable USB Mass Storage Driver Support	★ Enabled Disabled

TPM Configuration

Trusted Computing Setting

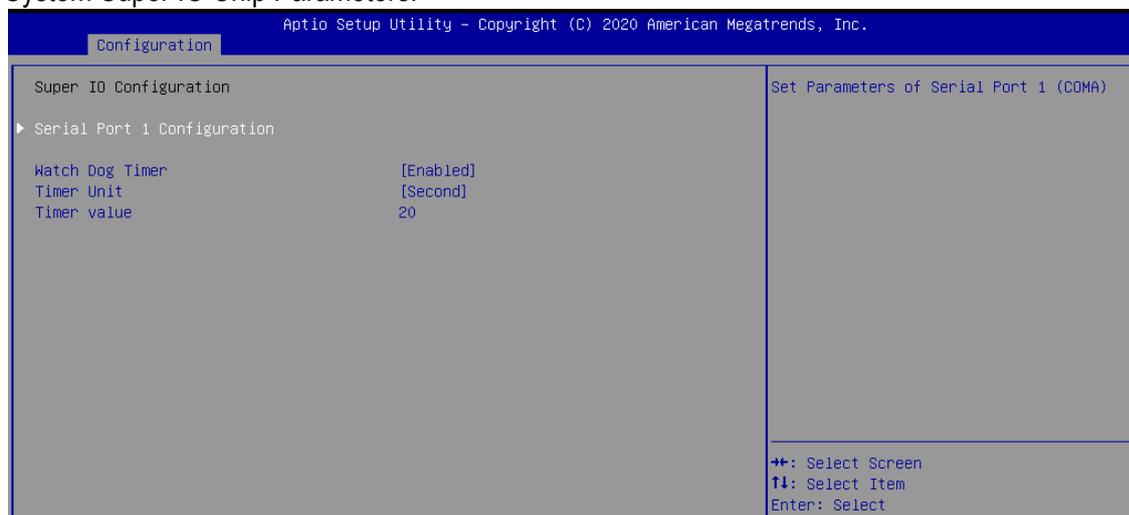


Feature	Description	Options
Security Device Support	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A Interface will not be available.	★ Enabled , Disabled
SHA-1 PCR Bank	Enables or Disables SHA-1 PCR Bank	★ Enabled , Disabled
SHA256 PCR Bank	Enables or Disables SHA256 PCR Bank	★ Enabled , Disabled
Pending operation	Schedule an Operation for the Security Device. Note: Your Computer will reboot during restart in order to change State of Security Device	★None, TPM Clear
Platform Hierarchy	Enables or Disables Platform Hierarchy	★ Enabled , Disabled
Storage Hierarchy	Enables or Disables Storage Hierarchy	★ Enabled , Disabled
Endorsement Hierarchy	Enables or Disables Endorsement Hierarchy	★ Enabled , Disabled
TPM2.0 UEFI Spec Version	Select the TCG2 Spec Version Support TCG_1_2: the Compatible mode for Win8/Win10 TCG_2: Support new TCG2 protocol and event format for Win10 or later	★TCG_2 ,TCG_1_2
Physical Presence Spec Version	Select to Tell O.S. to Support PPI Spec Version 1.2 or 1.3. Note some HCK tests might not support 1.3	★1.3,1.2

Device Select	TPM 1.2 will restrict support to TPM 1.2 devices, TPM 2.0 will restrict support to TPM 2.0 devices, Auto will support both with the default set to TPM 2.0 devices if not found, TPM 1.2 devices will be enumerated.	★ Auto, TPM 1.2, TPM 2.0
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Super IO Configuration

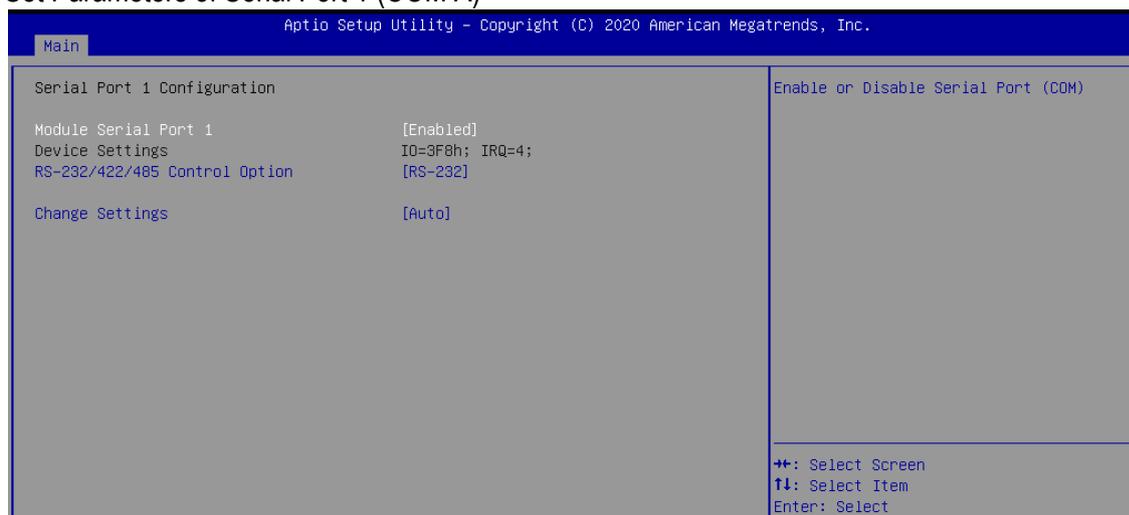
System Super IO Chip Parameters.



Feature	Description	Options
Watch Dog Timer	Enable/Disable Watch Dog Timer	★ Disabled, Enabled
Timer Unit	Select Timer count unit of WDT	★ Second, Minute
Timer value	Set WDT Timer value	★ 20

Serial Port 1 Configuration

Set Parameters of Serial Port 1 (COM A)



Feature	Description	Options
Module Serial Port1	Enable or Disable Serial Port (COM)	★ Enabled, Disabled
RS-232/422/485	Serial Port RS-232/422/485 Control Option	★ RS-232,RS-485

Control Option		HALF DUPLEX,RS-422 FULL DUPLAX
Change Settings	Select an optimal settings for Super IO Device	★ Auto, IO=3F8h; IRQ=4, IO=3F8h; IRQ=3,4,5,6,7,9,10,1 1,12 IO=2F8h; IRQ=3,4,5,6,7,9,10,1 1,12 IO=3E8h; IRQ=3,4,5,6,7,9,10,1 1,12 IO=2E8h; IRQ=3,4,5,6,7,9,10,1 1,12

H/W Monitor

Monitor hardware status

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Configuration

<pre> CPU temperature : +49 C Vcore : +0.744 V +3.3V : +3.318 V +5V : +5.068 V +12V : +11.939 V VDIMM : +1.185 V </pre>	<pre> ++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit F12: Capture Screen ESC: Exit </pre>
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Serial Port Console Redirection

Serial Port Console Redirection

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Configuration

<pre> Serial Port Console Redirection COM0 Console Redirection [Disabled] ▶ Console Redirection Settings COM1(Pci Bus0,Dev0,Func0) (Disabled) Console Redirection Port Is Disabled </pre>	<pre> Console Redirection Enable or Disable. ++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit F12: Capture Screen ESC: Exit </pre>
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Feature	Description	Options
Console Redirection	Console Redirection Enable or Disable	★ Disabled, Enabled

Console Redirection Settings

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Configuration

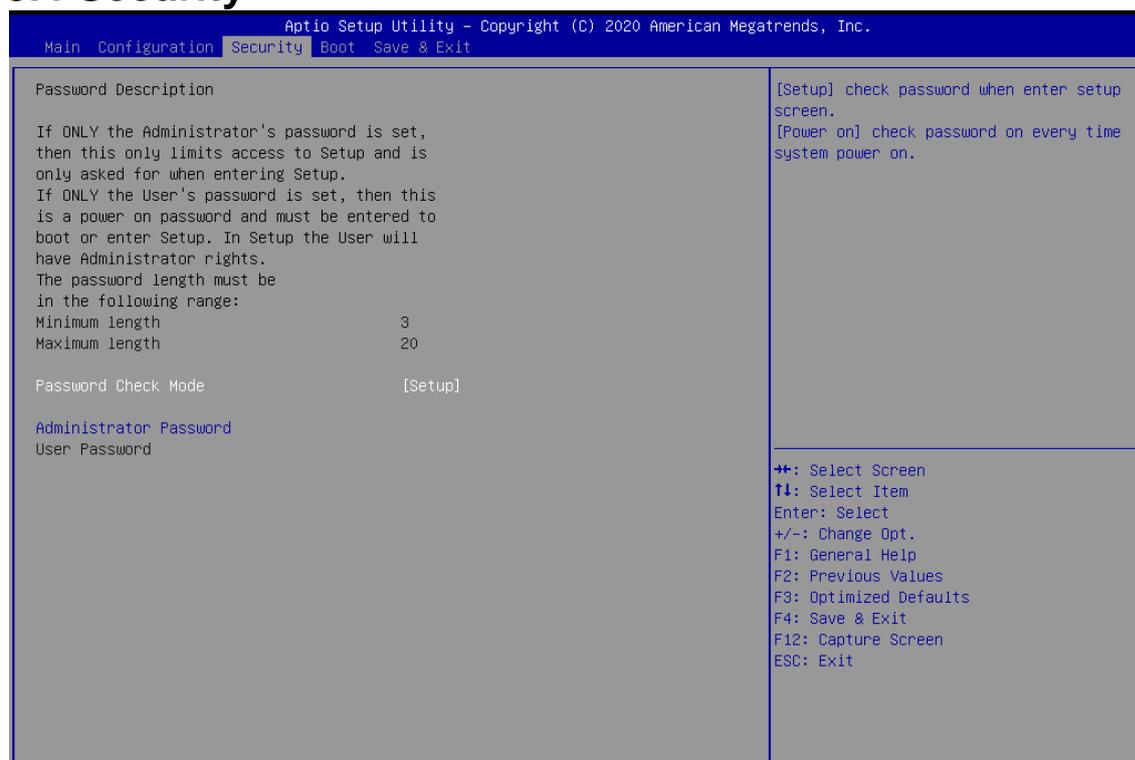
<pre>COM0 Console Redirection Settings Terminal Type [ANSI] Bits per second [115200] Data Bits [8] Parity [None] Stop Bits [1] Flow Control [None] VT-UTF8 Combo Key Support [Enabled] Recorder Mode [Disabled] Resolution 100x31 [Disabled] Putty KeyPad [VT100]</pre>	<p>Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.</p> <hr/> <p> ++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit F12: Capture Screen ESC: Exit </p>
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Feature	Description	Options
Terminal Type	Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.	★ ANSI, VT100, VT100+, VT-UTF8
Bits per second	Select Serial port transmission speed. The speed must be matched on other side. Long or noisy lines may require lower speeds.	★ 115200, 9600, 19200, 38400, 57600
Data bits	Data bits	★ 8, 7
Parity	A parity bit can be sent with the data bits to detect some transmission errors. 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. They can be used as an additional data bit.	★ None, Even, Odd, Mark, Space
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	★ 1, 2

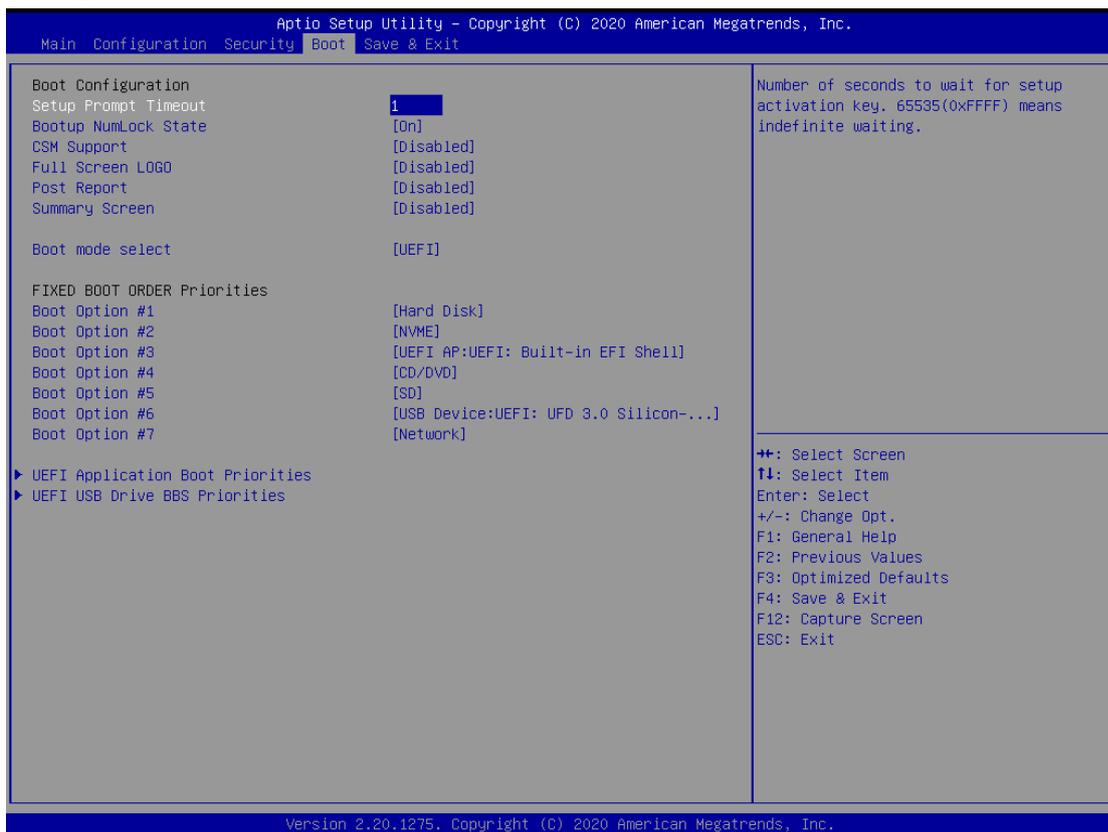
	more than 1 stop bit.	
Flow Control	Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signal.	★None, Hardware RTS/CTS
VT-UTFB Combo Key Support	Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals	★Enabled, Disabled
Recorder Mode	With this mode enabled only text will be sent. This is to capture Terminal data.	★Disabled, Enabled
Resolution 100x31	Enables or disables extended terminal resolution	★Disabled, Enabled
Putty KeyPad	Select FunctionKey and KeyPad on Putty	★VT100, LINUX,XTERMR6, SCO,ESCN,VT400

3.4 Security



Feature	Description	Options
Password Check Mode	[Setup] check password when enter setup screen. [Power on] check password on every time system power on.	★ Setup, Power on
Administrator Password	Set Administrator Password	

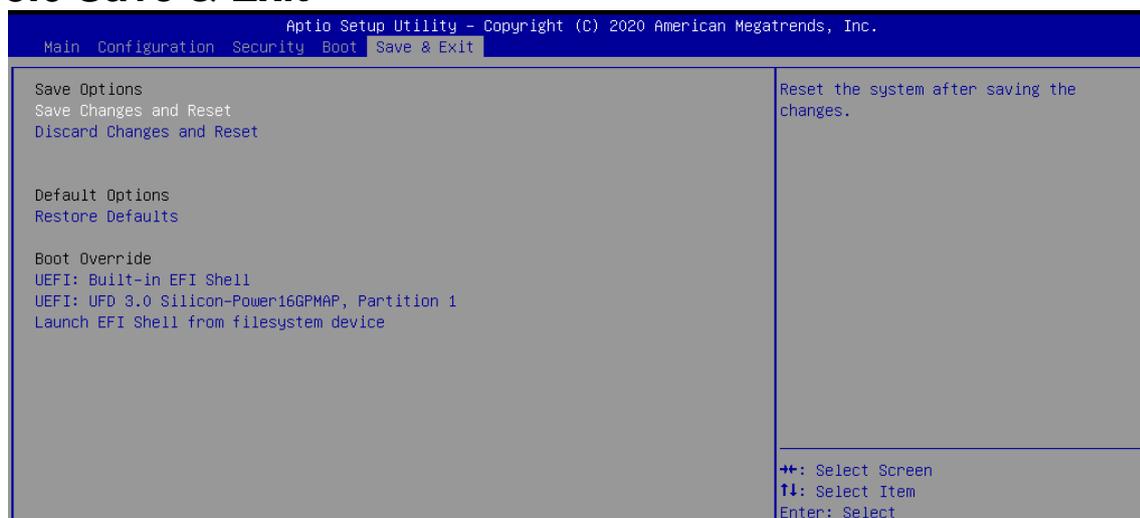
3.5 Boot



Feature	Description	Options
Setup Prompt Timeout	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.	★1
Bootup NumLock State	Select the keyboard NumLock state	★On, Off
CSM Support	Enable/Disable CSM support. Note: if you want to disable CSM support, you should set the video UEFI.	★ Disabled, Enabled
CSM Support[Enable]		
Network	Controls the execution of UEFI and Legacy Network OpROM	★ UEFI, Do not launch, Legacy
Storage	Controls the execution of UEFI and Legacy Storage OpROM	★ UEFI, Do not launch, Legacy
Video	Controls the execution of UEFI and Legacy Video OpROM	★ UEFI, Do not launch, Legacy
Full Screen LOGO	Enables or disables Quiet Boot option and Full screen Logo.	★ Disabled, Enabled
Post Report	Post Report Support Enabled/Disabled	★ Disabled, Enabled
Summary Screen	Summary Screen Support Enabled/Disabled	★ Disabled, Enabled
Boot mode select	Select boot mode LEGACY/UEFI	★UEFI ,Legacy
Boot Option #1~7	Sets the system boot order	★ Hard Disk, NVME, UEFI AP,

		CD/DVD,SD,USB Device, Network, Disabled
UEFI Application Boot Priorities	Specifies the Boot Device Priority sequence from available UEFI Application	

3.6 Save & Exit



Feature	Description	Options
Save Changes and Reset	Reset the system after saving the changes.	
Discard Changes and Reset	Reset system setup without saving any changes.	
Restore Defaults	Restore/Load Default values for all the setup options.	
UEFI: Built-in EFI Shell		
Launch EFI Shell from filesystem device	Attempts to Launch EFI Shell application (Shell.efi) from one of the available filesystem devices.	

Troubleshooting

This section provides a few useful tips to quickly get NANO-6051 running with success. This section will primarily focus on system integration issues, in terms of BIOS setting, and OS diagnostics.

Hardware Quick Installation

ATX Power Setting

Unlike other Single board computer, NANO-6051 supports ATX 12V 4 Pin or DC 12V Power adaptor only. Therefore, there is no other setting that needs to be setup. However, there is ATX 4 Pin Connector – J9 & DC JACK – J1 on the NANO-6051 board.



ATX 4 Pin Connector – J9



DC JACK – J1

BIOS Setting

It is assumed that users have correctly adopted modules and connected all the devices cables required before turning on ATX power. DDR4 So-DIMM Memory, keyboard, mouse, Mini DP connector, power cable of the device, ATX accessories are good examples that deserve attention. With no assurance of properly and correctly accommodating these modules and devices, it is very possible to encounter system failures that result in malfunction of any device.

To make sure that you have a successful start with NANO-6051, it is recommended, when going with the boot-up sequence, to hit “Delete” or “ESC” key and enter the BIOS setup menu to tune up a stable BIOS configuration so that you can wake up your system far well.

Loading the default optimal setting

When prompted with the main setup menu, please scroll down to “Restore Defaults”, press “Enter” and select “Yes” to load default optimal BIOS setup. This will force your BIOS setting back to the initial factory configurations. It is recommended to do this so you can be sure the system is running with the BIOS setting that Portwell has highly endorsed. As a matter of fact, users can load the default BIOS setting at any time when system appears to be unstable in boot up sequence.

Chapter 4 Important Instructions

This chapter includes instructions which must be carefully followed when the fan-less embedded system is used.

4.1 Note on the Warranty

Due to their limited service life, parts which, by their nature, are especially subject to wear are not included in the guarantee beyond the legal stipulations.

4.2 Exclusion of Accident Liability Obligation

Portwell, Inc. shall be exempt from the statutory accident liability obligation if users fail to abide by the safety instructions.

4.3 Liability Limitations / Exemption from the Warranty Obligation

In the event of damage to the system unit caused by failure to abide by the hints in this manual and on the unit (especially the safety instructions), Portwell, Inc. shall not be required to respect the warranty even during the warranty period and shall be free from the statutory accident liability obligation.

4.4 Declaration of Conformity

EMC

CE/FCC Class A

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This equipment may not cause harmful interference.
2. This equipment must accept any interference that may cause undesired operation.

Applicable Standards:

EN 55022: 2006 + A1: 2007, Class A

EN 61000-3-2: 2006

EN 61000-3-3: 1995 + A1: 2001 + A2: 2005

EN 55024: 1998 + A1: 2001 + A2: 2003

IEC 61000-4-2: 2008

IEC 61000-4-3: 2006 + A1: 2007

IEC 61000-4-4: 2004

IEC 61000-4-5: 2005

IEC 61000-4-6: 2007

IEC 61000-4-8: 1993 + A1: 2000

IEC 61000-4-11: 2004

FCC 47 CFR Part 15 Subpart

Chapter 5 Frequent asked question

Information & Support

Question: I forgot my password of system BIOS, what am I supposed to do?

Answer: You can switch off your power supply then find the JP6 on the NANO-6051 board to set it from 1-2 short to 2-3 short and wait 5 seconds to clean your password then set it back to 1-2 short to switch on your power supply.

JP6 : Clear CMOS Setup

	Jumper Setting Describe
*1-2	Normal
2-3	Clean CMOS

Question: How to update the BIOS file of NANO-6051?

Answer:

1. Please visit web site of [Portwell download center](http://www.portwell.com.tw/support/download_center.php) as below hyperlink
http://www.portwell.com.tw/support/download_center.php
Registering an account in advance is a must. (The E-Mail box should be an existing Company email address that you check regularly.)
<http://www.portwell.com.tw/member/newmember.php>
2. Type in your User name and password and log in the download center.
3. Select "Search download" and type the keyword "NANO-6051".
4. Find the "BIOS" page and download the ROM file and flash utility.
5. Unzip file to bootable USB flash drive which can boot to dos mode. Then execute the "update.bat" or "update.efi". It will start to update BIOS.
NOTE: Once you use "update.efi" to update BIOS, it must be get into the SHELL MODE to update BIOS.
6. When you see the "FPT Operation Passed" message, which means the BIOS update processes finished. Please cut the AC power off and wait for 10 seconds before powering on.
7. When you see the "Programming success" message, which means the BIOS update processes finished. Please cut the AC power off and wait for 10 seconds before powering on.

Portwell Software Service

1. If you have customized requirements of BIOS, you can contact person of our company or branch.
2. If you have requirements of WDT 、GPIO APP, you can contact our headquarter or branch, and we can render you assistance on developing.

Portwell Worldwide:	
Portwell, Inc.	E-mail: info@portwell.com.tw
Shanghai Portwell	E-mail: info@portwell.com.cn
Portwell Japan, Inc	E-mail: info@portwell.co.jp
American Portwell Technology	E-mail: info@portwell.com
European Portwell Technology	E-mail: info@portwell.eu
Portwell UK Ltd.	E-mail: info@portwell.co.uk
Portwell Deutschland GmbH	E-mail: info@portwell.eu
Portwell India Technology	E-mail: info@portwell.in
Portwell Korea, Inc.	E-mail: info@portwell.co.kr
Portwell Latin America	E-mail: vendas@portwell.com.br

Industry Specifications

The list below provides links to industry specifications that apply to Portwell modules.

Low Pin Count Interface Specification, Revision 1.0 (LPC)

<http://www.intel.com/design/chipsets/industry/lpc.htm>

Universal Serial Bus (USB) Specification, Revision 2.0 <http://www.usb.org/home>

PCI Specification, Revision 2.3 <https://www.pcisig.com/specifications>

Serial ATA Specification, Revision 3.0 <http://www.serialata.org/>

PCI Express Base Specification, Revision 2.0 <https://www.pcisig.com/specifications>