NEXCOM International Co., Ltd.

# Intelligent Platform & Services Business Group

# COM Express Type 6

# ICES 675

User Manual

**NEXCOM International Co., Ltd.**
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www.nexcom.com

# Contents

# PREFACE

## Copyright



## Disclaimer

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## Acknowledgements

ICES 675 is a trademark of NEXCOM International Co., Ltd. All other product names mentioned herein are registered trademarks of their respective owners.

## Regulatory Compliance Statements

This section provides the FCC compliance statement for Class B devices and describes how to keep the system CE compliant.

## Declaration of Conformity

### FCC

This equipment has been tested and verified to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area (domestic environment) is likely to cause harmful interference, in which case the user will be required to correct the interference (take adequate measures) at their own expense.

### CE

The product(s) described in this manual complies with all applicable European Union (CE) directives if it has a CE marking. For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques.

# RoHS Compliance


## NEXCOM RoHS Environmental Policy and Status Update

NEXCOM is a global citizen for building the digital infrastructure. We are committed to providing green products and services, which are compliant with European Union RoHS (Restriction on Use of Hazardous Substance in Electronic Equipment) directive 2011/65/EU, to be your trusted green partner and to protect our environment.

RoHS restricts the use of Lead (Pb) < 0.1% or 1,000ppm, Mercury (Hg) < 0.1% or 1,000ppm, Cadmium (Cd) < 0.01% or 100ppm, Hexavalent Chromium (Cr6+) < 0.1% or 1,000ppm, Polybrominated biphenyls (PBB) < 0.1% or 1,000ppm, and Polybrominated diphenyl Ethers (PBDE) < 0.1% or 1,000ppm.

In order to meet the RoHS compliant directives, NEXCOM has established an engineering and manufacturing task force to implement the introduction of green products. The task force will ensure that we follow the standard NEXCOM development procedure and that all the new RoHS components and new manufacturing processes maintain the highest industry quality levels for which NEXCOM are renowned.

The model selection criteria will be based on market demand. Vendors and suppliers will ensure that all designed components will be RoHS compliant.

## How to recognize NEXCOM RoHS Products?

For existing products where there are non-RoHS and RoHS versions, the suffix "(LF)" will be added to the compliant product name.

All new product models launched after January 2013 will be RoHS compliant. They will use the usual NEXCOM naming convention.

# Warranty and RMA

## NEXCOM Warranty Period

NEXCOM manufactures products that are new or equivalent to new in accordance with industry standard. NEXCOM warrants that products will be free from defect in material and workmanship for 2 years, beginning on the date of invoice by NEXCOM. HCP series products (Blade Server) which are manufactured by NEXCOM are covered by a three year warranty period.

## NEXCOM Return Merchandise Authorization (RMA)

- Customers shall enclose the "NEXCOM RMA Service Form" with the returned packages.
- Customers must collect all the information about the problems encountered and note anything abnormal or, print out any on-screen messages, and describe the problems on the "NEXCOM RMA Service Form" for the RMA number apply process.
- Customers can send back the faulty products with or without accessories (manuals, cable, etc.) and any components from the card, such as CPU and RAM. If the components were suspected as part of the problems, please note clearly which components are included. Otherwise, NEXCOM is not responsible for the devices/parts.
- Customers are responsible for the safe packaging of defective products, making sure it is durable enough to be resistant against further damage and deterioration during transportation. In case of damages occurred during transportation, the repair is treated as "Out of Warranty."
- Any products returned by NEXCOM to other locations besides the customers' site will bear an extra charge and will be billed to the customer.

## Repair Service Charges for Out-of-Warranty Products

NEXCOM will charge for out-of-warranty products in two categories, one is basic diagnostic fee and another is component (product) fee.

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### System Level

- Component fee: NEXCOM will only charge for main components such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistor, capacitor.
- Items will be replaced with NEXCOM products if the original one cannot be repaired. Ex: motherboard, power supply, etc.
- Replace with 3rd party products if needed.
- If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

### Board Level

- Component fee: NEXCOM will only charge for main components, such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistors, capacitors.
- If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

## Warnings

Read and adhere to all warnings, cautions, and notices in this guide and the documentation supplied with the chassis, power supply, and accessory modules. If the instructions for the chassis and power supply are inconsistent with these instructions or the instructions for accessory modules, contact the supplier to find out how you can ensure that your computer meets safety and regulatory requirements.

## Cautions

Electrostatic discharge (ESD) can damage system components. Do the described procedures only at an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the computer chassis.

# Safety Information

Before installing and using the device, note the following precautions:

- Read all instructions carefully.
- Do not place the unit on an unstable surface, cart, or stand.
- Follow all warnings and cautions in this manual.
- When replacing parts, ensure that your service technician uses parts specified by the manufacturer.
- Avoid using the system near water, in direct sunlight, or near a heating device.
- The load of the system unit does not solely rely for support from the rackmounts located on the sides. Firm support from the bottom is highly necessary in order to provide balance stability.

# Installation Recommendations

Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.

Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:

- A Philips screwdriver
- A flat-tipped screwdriver
- A grounding strap
- An anti-static pad

Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nose pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

# Safety Precautions

1. Read these safety instructions carefully.

2. Keep this User Manual for later reference.

3. Disconnect the equipment from any AC outlet before cleaning or installing a component inside the chassis. Use a damp cloth. Do not use liquid or spray detergents for cleaning.

4. To prevent electrostatic build-up, leave the board in its anti-static bag until you are ready to install it.

5. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.

6. Keep the board away from humidity.

7. Put the board on a stable surface. Dropping it or letting it fall may cause damage.

8. Wear anti-static wrist strap.

9. Do all preparation work on a static-free surface.

10. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.

11. Hold the board only by its edges. Be careful not to touch any of the components, contacts or connections.

12. All cautions and warnings on the board should be noted.

13. Use the correct mounting screws and do not over tighten the screws.

14. Keep the original packaging and the anti-static bag; in case the board has to be returned for repair or replacement.

## Technical Support and Assistance

1. For the most updated information of NEXCOM products, visit NEXCOM's website at www.nexcom.com.

2. For technical issues that require contacting our technical support team or sales representative, please have the following information ready before calling:
   - Product name and serial number
   - Detailed information of the peripheral devices
   - Detailed information of the installed software (operating system, version, application software, etc.)
   - A complete description of the problem
   - The exact wordings of the error messages

Warning!

1. Handling the unit: carry the unit with both hands and handle it with care.

2. Maintenance: to keep the unit clean, use only approved cleaning products or clean with a dry cloth.

## Conventions Used in this Manual

Warning:
Information about certain situations, which if not observed, can cause personal injury. This will prevent injury to yourself when performing a task.


Caution:
Information to avoid damaging components or losing data.

Note:
Provides additional information to complete a task easily.

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# Package Contents

Before continuing, verify that the ICES 675 package that you received is complete. Your package should have the item listed in the table below. The CPU fan kit, heat spreader kit and carrier board are optional accessories.

| Item | Description | Qty |
|---|---|---|
| 1 | ICES 675 Mainboard | 1 |

### CPU Fan, Heat Spreader and Carrier Board (Optional)

| Item | Part Number | Description |
|---|---|---|
| 1 | TBD | ICES 675 Heat Spreader Kit |
| 2 | TBD | ICES 675 CPU Cooler Kit |
| 3 | 10KB0806000X0 | ICEB 8060 (COM Express Carrier Board) |

Heat Spreader:
Please note that the heat spreader is a thermal coupling device that comes in contact with the CPU through thermal gap fillers. It is designed to transfer the heat away from the CPU and is different to a heatsink in terms of cooling properties. Please do not consider it as a heatsink.

Additional thermal gap fillers can be used on other components on the module to allow them to come in contact with the heat spreader for heat dissipation.

# Ordering Information

The following information below provides ordering information for ICES 675.

### ICES 675 (P/N: 10K00067500X0)

Onboard 8th generation Intel® Xeon® E-2176M processor, 2 x DDR4 SO-DIMM (support ECC), support multiple displays via VGA/LVDS/DDI1/2, 4 x SATAIII, 1 x GbE LAN, 2 x COM, 4 x USB 3.0, 8 x USB 2.0, HD audio, 8-bit GPIO

### ICES 675 (P/N: TBD)

Onboard 8th generation Intel® Core™ i7-8850H processor, 2 x DDR4 SO-DIMM (non-ECC), support multiple displays via VGA/LVDS/DDI1/2, 4 x SATAIII, 1 x GbE LAN, 2 x COM, 4 x USB 3.0, 8 x USB 2.0, HD audio, 8-bit GPIO

### ICES 675 (P/N: TBD)

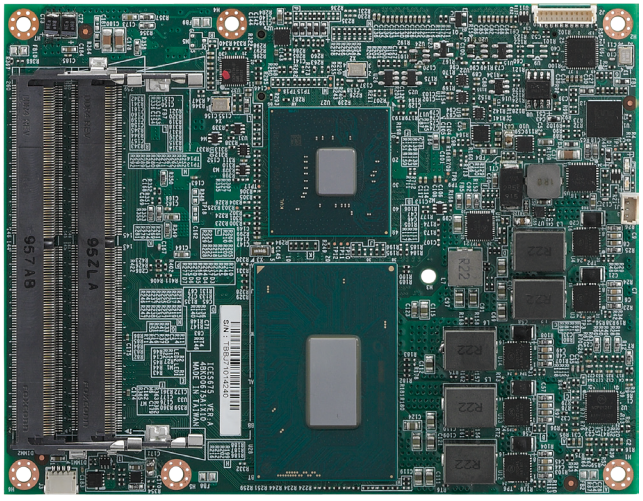
Onboard 8th generation Intel® Core™ i5-8400H processor, 2 x DDR4 SO-DIMM (non-ECC), support multiple displays via VGA/LVDS/DDI1/2, 4 x SATAIII, 1 x GbE LAN, 2 x COM, 4 x USB 3.0, 8 x USB 2.0, HD audio, 8-bit GPIO

### Optional Accessories

- **CPU Cooler (P/N: TBD)**
- **Heat Spreader (P/N: TBD)**
- **TPM 2.0 Module Kit (P/N: 79E00TPM01X00)**

# Chapter 1: Product Introduction

## Overview - ICES 675



## Key Features

- 8th generation Intel® Core™ processors, BGA 1440, PCH CM246
- 2 channel DDR4 with ECC or non-ECC SO-DIMM 2666MHz up to 32GB
- Support triple display VGA, 2 x DP, eDP/LVDS 24-bit dual channel
- PCI Express lane x16 (configurable: “1 x 16”, “2 x 8”, “1 x 8 + 2 x 4”)
- PCI Express lane x1 (Gen 3), 8 x (can be configured to “x 1”, “x 4”)
- IO: 2 x UART (RX/TX), 8-bit DIO, WDT, TPM (optional)

# Hardware Specifications

## CPU/Chipset

- 8th generation Intel® Core™ processors, BGA 1440
- Intel® Xeon® E-2176M processor, 6 Cores, 12M Cache, 2.7GHz (4.4GHz), 45W (support ECC)
- Intel® Core™ i7-8850H processor, 6 Cores, 12M Cache, 2.6GHz (4.3GHz), 45W
- Intel® Core™ i5-8400H processor, 4 cores, 8M Cache, 2.5GHz (4.2GHz), 45W
- Intel® Mobile CM246

## Main Memory

- Dual channel DDR4 SO-DIMM memory socket with non-ECC support, up to 32 GB 2666MHz, optional ECC support with Intel® Xeon® E-2176M processor

## Display

- Integrated Intel® Gen9 graphics graphic engine
- 1 x VGA connector (resolution up to 1920x1080 @ 60Hz)
- 1 x LVDS connector (resolution up to 1920x1080 @ 60Hz)
- DDI 1/2 port configurable to HDMI 1.4/DVI/DisplayPort 1.4 HDMI up to 4096x2160 @ 30Hz/24bpp, DVI up to 1920x1200 @60Hz, DP up to 4096x2304 @ 60Hz

## BIOS

- AMI (UEFI)

## COM Express Connector

- AB
  LVDS: (LVDS/eDP co-lay), VGA: (VGA/DDI port3 co-lay), 1 x GbE LAN, 6 x PCIe x1, HD Audio, 4 x SATA III, 8 x USB 2.0, LPC Bus, SMBus/I2C, 2 x COM, GPIO 8-bit
- CD
  DDI1, DDI2, 1 x PCIe x16, 2 x PCIe x1, 4 x USB 3.0

## Power Requirements

- +12VDC, +5Vsb
- Support both AT and ATX power supply mode

## Dimensions

- 125mm (W) x 95mm (L)

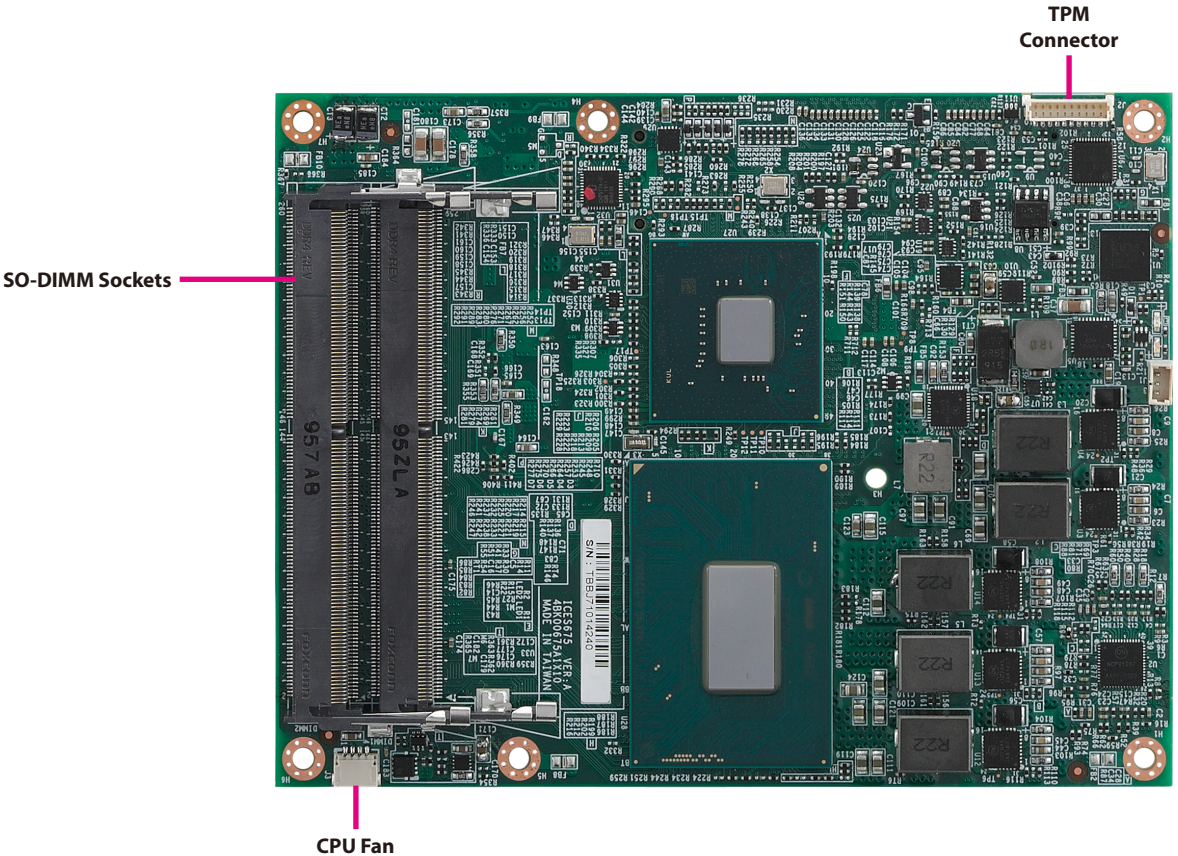
## Environment

- Board level operating temperatures: 0°C to 60°C
- Storage temperatures: -20°C to 85°C
- Relative humidity:
  10% to 95% (operating, non-condensing)
  5% to 95% (non-operating, non-condensing)

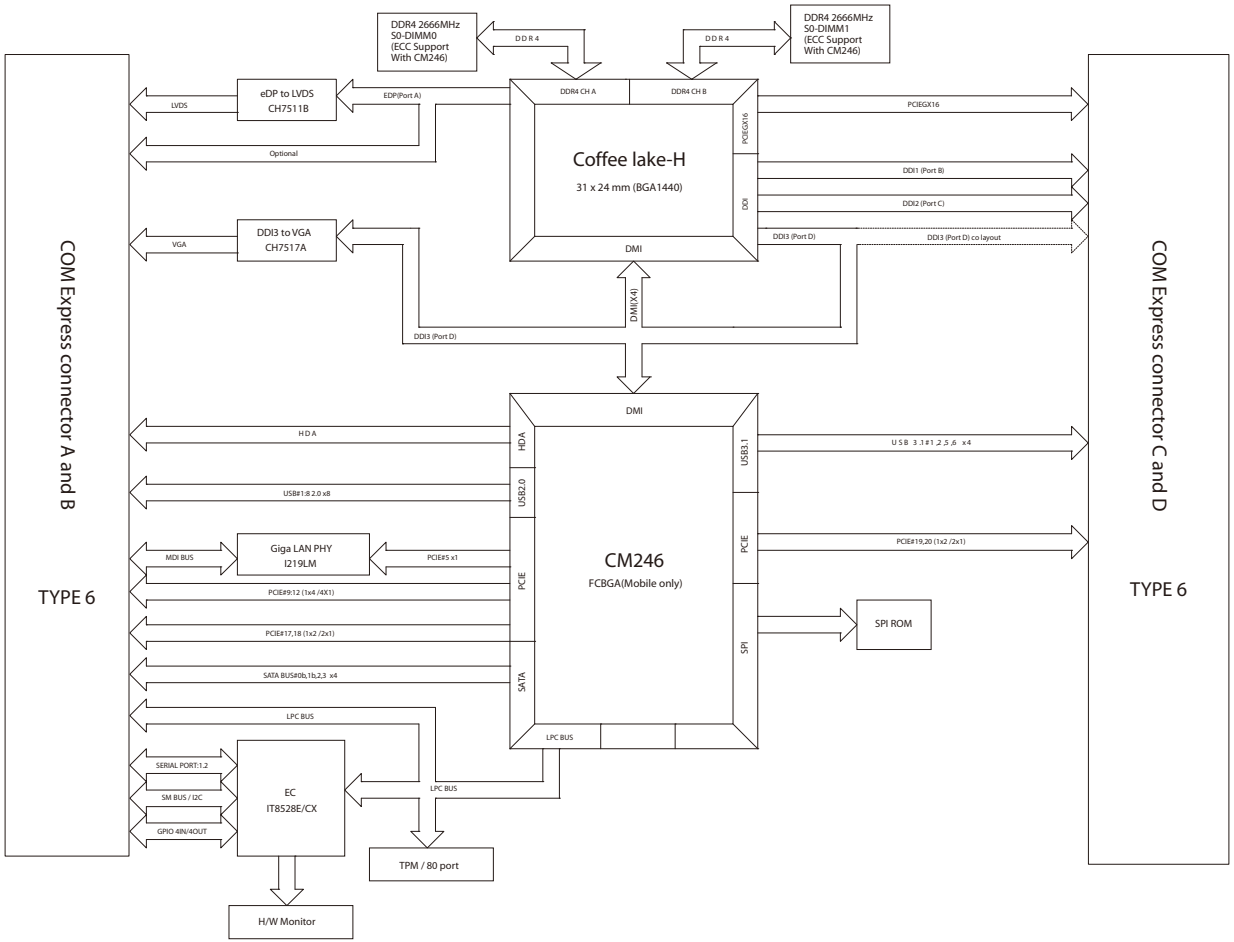
## Certifications

- Meet CE/FCC Class B

# Knowing Your ICES 675



# Block Diagram



# Chapter 2: Connector Pinout Assignments

## Before You Begin

- Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.
- Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:
  - A Philips screwdriver
  - A flat-tipped screwdriver
  - A set of jewelers screwdrivers
  - A grounding strap
  - An anti-static pad
- Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nosed pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.
- Before working on internal components, make sure that the power is off. Ground yourself before touching any internal components, by touching a metal object. Static electricity can damage many of the electronic components. Humid environments tend to have less static electricity than dry environments. A grounding strap is warranted whenever danger of static electricity exists.

## Precautions

Computer components and electronic circuit boards can be damaged by discharges of static electricity. Working on computers that are still connected to a power supply can be extremely dangerous.

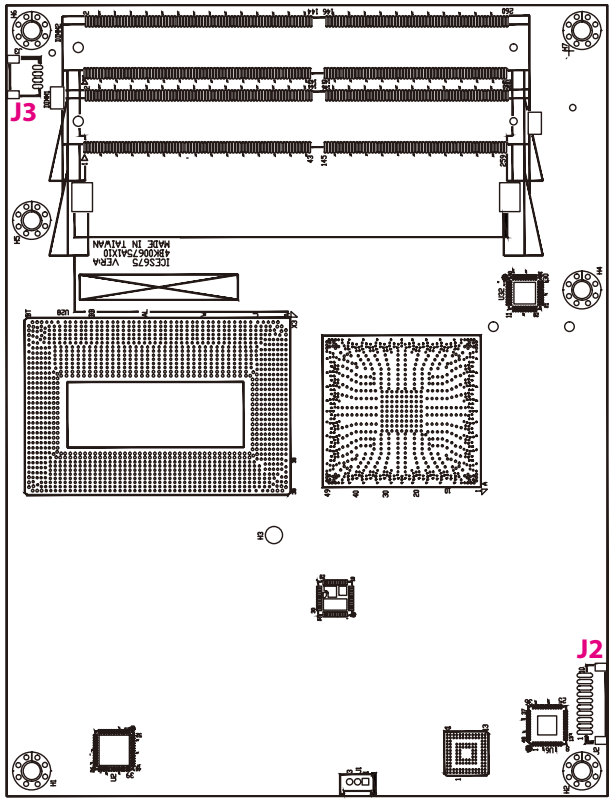
Follow the guidelines below to avoid damage to your computer or yourself:

- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal body of any other grounded appliance.
- Hold electronic circuit boards by the edges only. Do not touch the components on the board unless it is necessary to do so. Don't flex or stress the circuit board.
- Leave all components inside the static-proof packaging that they shipped with until they are ready for installation.
- Use correct screws and do not over tighten screws.

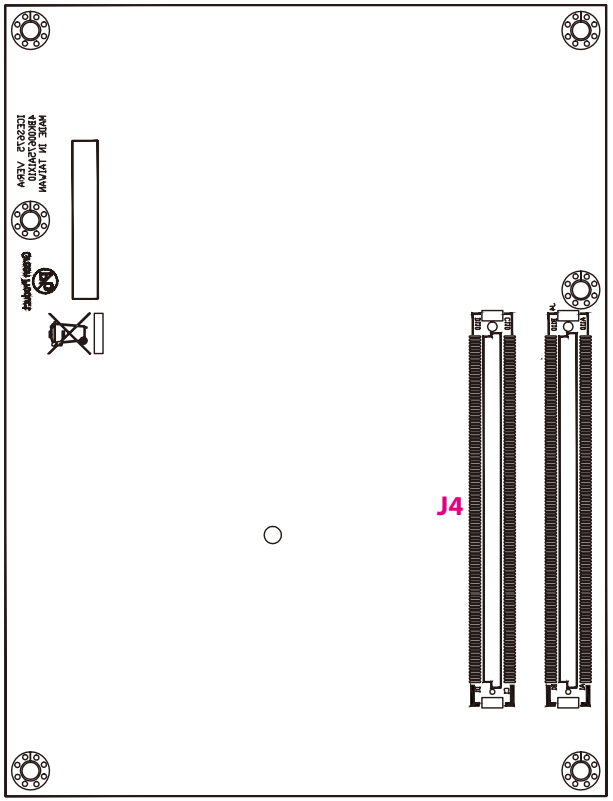
# Locations of the Connectors

The figures below show the locations of the connectors for ICES 675.

## Top View




## Bottom View

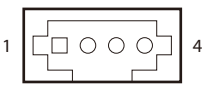


# Connector Pin Definitions

## Internal Connectors

### CPU Fan

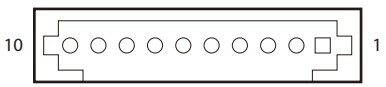
Connector type: 1x4 4-pin header
Connector location: J3




| Pin | Definition | Pin | Definition |
|---|---|---|---|
| 1 | PWM | 2 | TACH |
| 3 | +12V | 4 | GND |

### TPM Connector

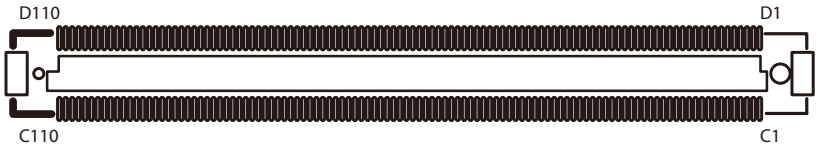
Connector type: 1x10 10-pin header
Connector location: J2



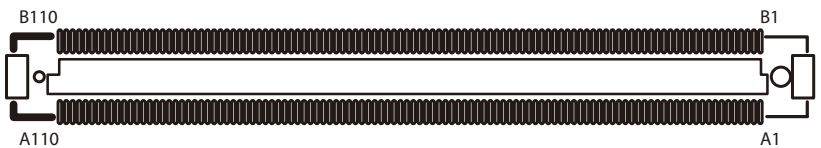

| Pin | Definition | Pin | Definition |
|---|---|---|---|
| 1 | GND | 2 | I_PLTRST# |
| 3 | CLKOUT_LPC1 | 4 | LPC_FRAME# |
| 5 | LAD3 | 6 | LAD2 |
| 7 | LAD1 | 8 | LAD0 |
| 9 | LPC_SERIRQ_C | 10 | +3V3 |

## High Speed Board-to-Board Connector: Row A and B, Row C and D

Connector location: J4




**COM Express C&D Connector**




**COM Express A&B Connector**

| Pin | Definition | Pin | Definition | Pin | Definition | Pin | Definition |
|---|---|---|---|---|---|---|---|
| A1 | GND(FIXED) | B1 | GND(FIXED) | C1 | GND(FIXED) | D1 | GND(FIXED) |
| A2 | GBE0_MDI3- | B2 | GBE0_ACT# | C2 | GND | D2 | GND |
| A3 | GBE0_MDI3+ | B3 | LPC_FRAME# | C3 | USB_SSRX0- | D3 | USB_SSTX0- |
| A4 | GBE0_LINK100# | B4 | LPC_AD0 | C4 | USB_SSRX0+ | D4 | USB_SSTX0+ |
| A5 | GBE0_LINK1000# | B5 | LPC_AD1 | C5 | GND | D5 | GND |
| A6 | GBE0_MDI2- | B6 | LPC_AD2 | C6 | USB_SSRX1- | D6 | USB_SSTX1- |
| A7 | GBE0_MDI2+ | B7 | LPC_AD3 | C7 | USB_SSRX1+ | D7 | USB_SSTX1+ |
| A8 | GBE0_LINK# | B8 | LPC_DRQ0# | C8 | GND | D8 | GND |
| A9 | GBE0_MDI1- | B9 | LPC_DRQ1# | C9 | USB_SSRX2- | D9 | USB_SSTX2- |
| A10 | GBE0_MDI1+ | B10 | LPC_CLK | C10 | USB_SSRX2+ | D10 | USB_SSTX2+ |
| A11 | GND(FIXED) | B11 | GND(FIXED) | C11 | GND(FIXED) | D11 | GND(FIXED) |
| A12 | GBE0_MDI0- | B12 | PWRBTN# | C12 | USB_SSRX3- | D12 | USB_SSTX3- |
| A13 | GBE0_MDI0+ | B13 | SMB_CK | C13 | USB_SSRX3+ | D13 | USB_SSTX3+ |

| Pin | Definition | Pin | Definition | Pin | Definition | Pin | Definition |
|---|---|---|---|---|---|---|---|
| A14 | GBE0_CTREF | B14 | SMB_DAT | C14 | GND | D14 | GND |
| A15 | SUS_S3# | B15 | SMB_ALERT# | C15 | NC | D15 | DDI1_CTRL_CLK_AUX+ |
| A16 | SATA0_TX+ | B16 | SATA1_TX+ | C16 | NC | D16 | DDI1_CTRL_DATA_AUX- |
| A17 | SATA0_TX- | B17 | SATA1_TX- | C17 | RSVD | D17 | RSVD |
| A18 | SUS_S4# | B18 | SUS_STAT# | C18 | RSVD | D18 | RSVD |
| A19 | SATA0_RX+ | B19 | SATA1_RX+ | C19 | PCIE_RX6+ | D19 | PCIE_TX6+ |
| A20 | SATA0_RX- | B20 | SATA1_RX- | C20 | PCIE_RX6- | D20 | PCIE_TX6- |
| A21 | GND(FIXED) | B21 | GND(FIXED) | C21 | GND(FIXED) | D21 | GND(FIXED) |
| A22 | SATA2_TX+ | B22 | SATA3_TX+ | C22 | NC | D22 | NC |
| A23 | SATA2_TX- | B23 | SATA3_TX- | C23 | NC | D23 | NC |
| A24 | SUS_S5# | B24 | PWR_OK | C24 | DDI1_HPD | D24 | RSVD |
| A25 | SATA2_RX+ | B25 | SATA3_RX+ | C25 | NC | D25 | RSVD |
| A26 | SATA2_RX- | B26 | SATA3_RX- | C26 | NC | D26 | DDI1_PAIR0+ |
| A27 | BATLOW# | B27 | WDT | C27 | RSVD | D27 | DDI1_PAIR0- |
| A28 | (S)ATA_ACT# | B28 | AC/HDA_SDIN2 | C28 | RSVD | D28 | RSVD |
| A29 | AC/HDA_SYNC | B29 | AC/HDA_SDIN1 | C29 | NC | D29 | DDI1_PAIR1+ |
| A30 | AC/HDA_RST# | B30 | AC/HDA_SDIN0 | C30 | NC | D30 | DDI1_PAIR1- |
| A31 | GND(FIXED) | B31 | GND(FIXED) | C31 | GND(FIXED) | D31 | GND(FIXED) |
| A32 | AC/HDA_BITCLK | B32 | SPKR | C32 | DDI2_CTRL_CLK_AUX+ | D32 | DDI1_PAIR2+ |
| A33 | AC/HDA_SDOUT | B33 | I2C_CK | C33 | DDI2_CTRL_DATA_AUX- | D33 | DDI1_PAIR2- |
| A34 | BIOS_DIS0# | B34 | I2C_DAT | C34 | DDI2_DDC_AUX_SEL | D34 | DDI1_DDC_AUX_SEL |
| A35 | THRMTRIP# | B35 | THRM# | C35 | RSVD | D35 | RSVD |
| A36 | USB6- | B36 | USB7- | C36 | DDI3_CTRL_CLK_AUX+ | D36 | DDI1_PAIR3+ |
| A37 | USB6+ | B37 | USB7+ | C37 | DDI3_CTRL_DATA_AUX- | D37 | DDI1_PAIR3- |
| A38 | USB_6_7_OC# | B38 | USB_4_5_OC# | C38 | DDI3_DDC_AUX_SEL | D38 | RSVD |
| A39 | USB4- | B39 | USB5- | C39 | DDI3_PAIR0+ | D39 | DDI2_PAIR0+ |
| A40 | USB4+ | B40 | USB5+ | C40 | DDI3_PAIR0- | D40 | DDI2_PAIR0- |
| A41 | GND(FIXED) | B41 | GND(FIXED) | C41 | GND(FIXED) | D41 | GND(FIXED) |

| Pin | Definition | Pin | Definition | Pin | Definition | Pin | Definition |
|---|---|---|---|---|---|---|---|
| A42 | USB2- | B42 | USB3- | C42 | DDI3_PAIR1+ | D42 | DDI2_PAIR1+ |
| A43 | USB2+ | B43 | USB3+ | C43 | DDI3_PAIR1- | D43 | DDI2_PAIR1- |
| A44 | USB_2_3_OC# | B44 | USB_0_1_OC# | C44 | DDI3_HPD | D44 | DDI2_HPD |
| A45 | USB0- | B45 | USB1- | C45 | RSVD | D45 | RSVD |
| A46 | USB0+ | B46 | USB1+ | C46 | DDI3_PAIR2+ | D46 | DDI2_PAIR2+ |
| A47 | VCC_RTC | B47 | EXCD1_PERST# | C47 | DDI3_PAIR2- | D47 | DDI2_PAIR2- |
| A48 | EXCD0_PERST# | B48 | NC | C48 | RSVD | D48 | RSVD |
| A49 | NC | B49 | SYS_RESET# | C49 | DDI3_PAIR3+ | D49 | DDI2_PAIR3+ |
| A50 | LPC_SERIRQ | B50 | CB_RESET# | C50 | DDI3_PAIR3- | D50 | DDI2_PAIR3- |
| A51 | GND(FIXED) | B51 | GND(FIXED) | C51 | GND(FIXED) | D51 | GND(FIXED) |
| A52 | PCIE_TX5+ | B52 | PCIE_RX5+ | C52 | PEG_RX0+ | D52 | PEG_TX0+ |
| A53 | PCIE_TX5- | B53 | PCIE_RX5- | C53 | PEG_RX0- | D53 | PEG_TX0- |
| A54 | GPI0 | B54 | GPO1 | C54 | TYPE0# | D54 | COM_CFG2 |
| A55 | PCIE_TX4+ | B55 | PCIE_RX4+ | C55 | PEG_RX1+ | D55 | PEG_TX1+ |
| A56 | PCIE_TX4- | B56 | PCIE_RX4- | C56 | PEG_RX1- | D56 | PEG_TX1- |
| A57 | GND | B57 | GPO2 | C57 | TYPE1# | D57 | TYPE2# |
| A58 | PCIE_TX3+ | B58 | PCIE_RX3+ | C58 | PEG_RX2+ | D58 | PEG_TX2+ |
| A59 | PCIE_TX3- | B59 | PCIE_RX3- | C59 | PEG_RX2- | D59 | PEG_TX2- |
| A60 | GND(FIXED) | B60 | GND(FIXED) | C60 | GND(FIXED) | D60 | GND(FIXED) |
| A61 | PCIE_TX2+ | B61 | PCIE_RX2+ | C61 | PEG_RX3+ | D61 | PEG_TX3+ |
| A62 | PCIE_TX2- | B62 | PCIE_RX2- | C62 | PEG_RX3- | D62 | PEG_TX3- |
| A63 | GPI1 | B63 | GPO3 | C63 | RSVD | D63 | RSVD |
| A64 | PCIE_TX1+ | B64 | PCIE_RX1+ | C64 | RSVD | D64 | RSVD |
| A65 | PCIE_TX1- | B65 | PCIE_RX1- | C65 | PEG_RX4+ | D65 | PEG_TX4+ |
| A66 | GND | B66 | WAKE0# | C66 | PEG_RX4- | D66 | PEG_TX4- |
| A67 | GPI2 | B67 | WAKE1# | C67 | RSVD | D67 | GND |
| A68 | PCIE_TX0+ | B68 | PCIE_RX0+ | C68 | PEG_RX5+ | D68 | PEG_TX5+ |
| A69 | PCIE_TX0- | B69 | PCIE_RX0- | C69 | PEG_RX5- | D69 | PEG_TX5- |

| Pin | Definition | Pin | Definition | Pin | Definition | Pin | Definition |
|---|---|---|---|---|---|---|---|
| A70 | GND(FIXED) | B70 | GND(FIXED) | C70 | GND(FIXED) | D70 | GND(FIXED) |
| A71 | LVDS_A0+ | B71 | LVDS_B0+ | C71 | PEG_RX6+ | D71 | PEG_TX6+ |
| A72 | LVDS_A0- | B72 | LVDS_B0- | C72 | PEG_RX6- | D72 | PEG_TX6- |
| A73 | LVDS_A1+ | B73 | LVDS_B1+ | C73 | GND | D73 | GND |
| A74 | LVDS_A1- | B74 | LVDS_B1- | C74 | PEG_RX7+ | D74 | PEG_TX7+ |
| A75 | LVDS_A2+ | B75 | LVDS_B2+ | C75 | PEG_RX7- | D75 | PEG_TX7- |
| A76 | LVDS_A2- | B76 | LVDS_B2- | C76 | GND | D76 | GND |
| A77 | LVDS_VDD_EN | B77 | LVDS_B3+ | C77 | RSVD | D77 | RSVD |
| A78 | LVDS_A3+ | B78 | LVDS_B3- | C78 | PEG_RX8+ | D78 | PEG_TX8+ |
| A79 | LVDS_A3- | B79 | LVDS_BKLT_EN | C79 | PEG_RX8- | D79 | PEG_TX8- |
| A80 | GND(FIXED) | B80 | GND(FIXED) | C80 | GND(FIXED) | D80 | GND(FIXED) |
| A81 | LVDS_A_CK+ | B81 | LVDS_B_CK+ | C81 | PEG_RX9+ | D81 | PEG_TX9+ |
| A82 | LVDS_A_CK- | B82 | LVDS_B_CK- | C82 | PEG_RX9- | D82 | PEG_TX9- |
| A83 | LVDS_I2C_CK | B83 | LVDS_BKLT_CTRL | C83 | RSVD | D83 | RSVD |
| A84 | LVDS_I2C_DAT | B84 | VCC_5V_SBY | C84 | GND | D84 | GND |
| A85 | GPI3 | B85 | VCC_5V_SBY | C85 | PEG_RX10+ | D85 | PEG_TX10+ |
| A86 | RSVD | B86 | VCC_5V_SBY | C86 | PEG_RX10- | D86 | PEG_TX10- |
| A87 | EDP_HPD | B87 | VCC_5V_SBY | C87 | GND | D87 | GND |
| A88 | PCIE_CLK_REF+ | B88 | BIOS_DIS1# | C88 | PEG_RX11+ | D88 | PEG_TX11+ |
| A89 | PCIE_CLK_REF- | B89 | VGA_RED | C89 | PEG_RX11- | D89 | PEG_TX11- |
| A90 | GND(FIXED) | B90 | GND(FIXED) | C90 | GND(FIXED) | D90 | GND(FIXED) |
| A91 | SPI_POWER | B91 | VGA_GRN | C91 | PEG_RX12+ | D91 | PEG_TX12+ |
| A92 | SPI_MISO | B92 | VGA_BLUE | C92 | PEG_RX12- | D92 | PEG_TX12- |
| A93 | GPO0 | B93 | VGA_HSYNC | C93 | GND | D93 | GND |
| A94 | SPI_CLK | B94 | VGA_VSYNC | C94 | PEG_RX13+ | D94 | PEG_TX13+ |
| A95 | SPI_MOSI | B95 | VGA_I2C_CK | C95 | PEG_RX13- | D95 | PEG_TX13- |
| A96 | TPM_PP | B96 | VGA_I2C_DAT | C96 | GND | D96 | GND |
| A97 | TYPE10# | B97 | SPI_CS# | C97 | RSVD | D97 | RSVD |

| Pin | Definition | Pin | Definition | Pin | Definition | Pin | Definition |
|---|---|---|---|---|---|---|---|
| A98 | SER0_TX | B98 | RSVD | C98 | PEG_RX14+ | D98 | PEG_TX14+ |
| A99 | SER0_RX | B99 | RSVD | C99 | PEG_RX14- | D99 | PEG_TX14- |
| A100 | GND(FIXED) | B100 | GND(FIXED) | C100 | GND(FIXED) | D100 | GND(FIXED) |
| A101 | SER1_TX | B101 | FAN_PWMOUT | C101 | PEG_RX15+ | D101 | PEG_TX15+ |
| A102 | SER1_RX | B102 | FAN_TACHIN | C102 | PEG_RX15- | D102 | PEG_TX15- |
| A103 | NC | B103 | NC | C103 | GND | D103 | GND |
| A104 | VCC_12V | B104 | VCC_12V | C104 | VCC_12V | D104 | VCC_12V |
| A105 | VCC_12V | B105 | VCC_12V | C105 | VCC_12V | D105 | VCC_12V |
| A106 | VCC_12V | B106 | VCC_12V | C106 | VCC_12V | D106 | VCC_12V |
| A107 | VCC_12V | B107 | VCC_12V | C107 | VCC_12V | D107 | VCC_12V |
| A108 | VCC_12V | B108 | VCC_12V | C108 | VCC_12V | D108 | VCC_12V |
| A109 | VCC_12V | B109 | VCC_12V | C109 | VCC_12V | D109 | VCC_12V |
| A110 | GND(FIXED) | B110 | GND(FIXED) | C110 | GND(FIXED) | D110 | GND(FIXED) |

# Chapter 3: BIOS Setup

This chapter describes how to use the BIOS setup program for ICES 675. The BIOS screens provided in this chapter are for reference only and may change if the BIOS is updated in the future.

To check for the latest updates and revisions, visit the NEXCOM website at www.nexcom.com.tw.

## About BIOS Setup

The BIOS (Basic Input and Output System) Setup program is a menu driven utility that enables you to make changes to the system configuration and tailor your system to suit your individual work needs. It is a ROM-based configuration utility that displays the system's configuration status and provides you with a tool to set system parameters.

These parameters are stored in non-volatile battery-backed-up CMOS RAM that saves this information even when the power is turned off. When the system is turned back on, the system is configured with the values found in CMOS.

With easy-to-use pull down menus, you can configure such items as:

- Hard drives, diskette drives, and peripherals
- Video display type and display options
- Password protection from unauthorized use
- Power management features

The settings made in the setup program affect how the computer performs. It is important, therefore, first to try to understand all the setup options, and second, to make settings appropriate for the way you use the computer.

## When to Configure the BIOS

- This program should be executed under the following conditions:
- When changing the system configuration
- When a configuration error is detected by the system and you are prompted to make changes to the setup program
- When resetting the system clock
- When redefining the communication ports to prevent any conflicts
- When making changes to the Power Management configuration
- When changing the password or making other changes to the security setup

Normally, CMOS setup is needed when the system hardware is not consistent with the information contained in the CMOS RAM, whenever the CMOS RAM has lost power, or the system features need to be changed.

# Default Configuration

Most of the configuration settings are either predefined according to the Load Optimal Defaults settings which are stored in the BIOS or are automatically detected and configured without requiring any actions. There are a few settings that you may need to change depending on your system configuration.

# Entering Setup

When the system is powered on, the BIOS will enter the Power-On Self Test (POST) routines. These routines perform various diagnostic checks; if an error is encountered, the error will be reported in one of two different ways:

- If the error occurs before the display device is initialized, a series of beeps will be transmitted.
- If the error occurs after the display device is initialized, the screen will display the error message.

Powering on the computer and immediately pressing <Del> allows you to enter Setup.

Press the 

key to enter Setup:

# Legends

| Key | Function |
|---|---|
|  | Moves the highlight left or right to select a menu. |
|  | Moves the highlight up or down between sub-menus or fields. |
|   | Exits the BIOS Setup Utility. |
|   | Scrolls forward through the values or options of the highlighted field. |
|   | Scrolls backward through the values or options of the highlighted field. |
|   | Selects a field. |
|   | Displays General Help. |
|   | Load previous values. |
|   | Load optimized default values. |
|   | Saves and exits the Setup program. |
|   | Press <Enter> to enter the highlighted sub-menu. |

### Scroll Bar

When a scroll bar appears to the right of the setup screen, it indicates that there are more available fields not shown on the screen. Use the up and down arrow keys to scroll through all the available fields.

### Submenu

When "▶" appears on the left of a particular field, it indicates that a submenu which contains additional options are available for that field. To display the submenu, move the highlight to that field and press 

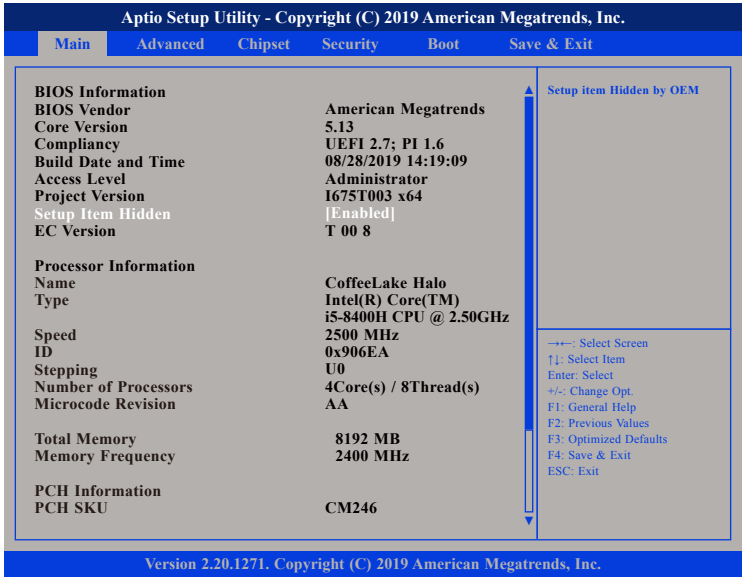
.

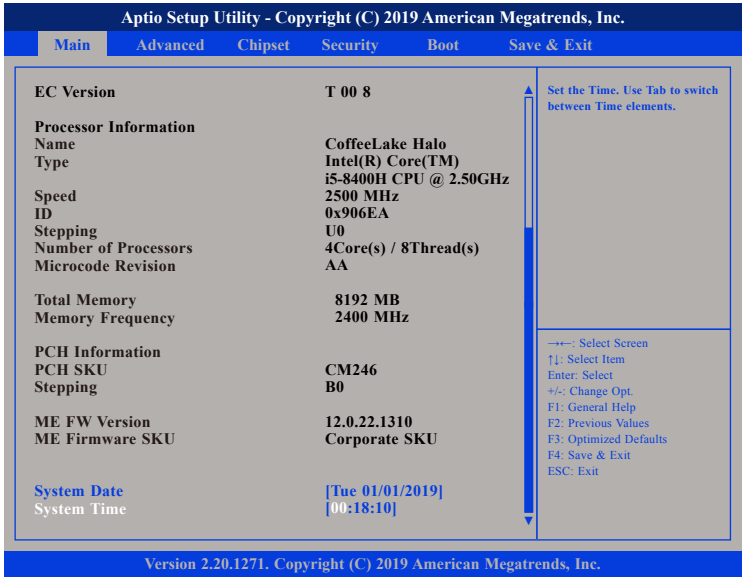
# BIOS Setup Utility

Once you enter the AMI BIOS Setup Utility, the Main Menu will appear on the screen. The main menu allows you to select from several setup functions and one exit. Use arrow keys to select among the items and press Enter to accept or enter the submenu.

## Main

The Main menu is the first screen that you will see when you enter the BIOS Setup Utility.




### Setup Item Hidden

Enables or disables hidden setup items.

### System Date

The date format is <day>, <month>, <date>, <year>. Day displays a day, from Monday to Sunday. Month displays the month, from January to December. Date displays the date, from 1 to 31. Year displays the year, from 1999 to 2099.

### System Time

The time format is <hour>, <minute>, <second>. The time is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Hour displays hours from 00 to 23. Minute displays minutes from 00 to 59. Second displays seconds from 00 to 59.

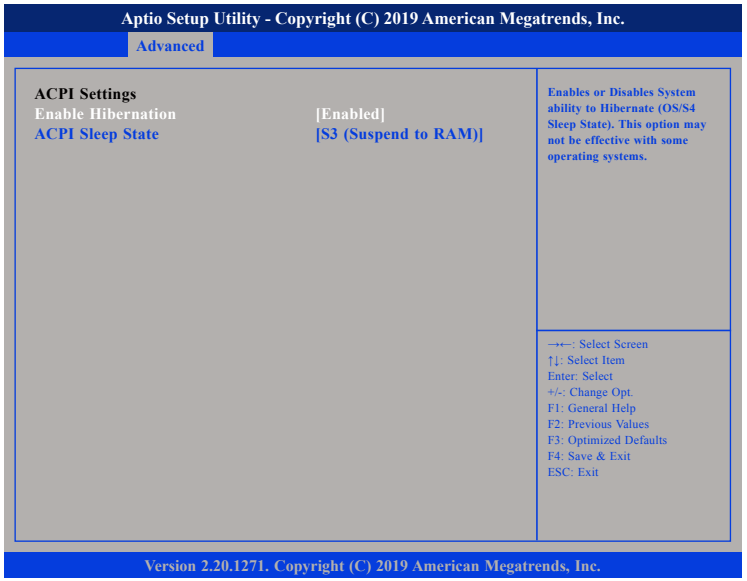
# Advanced

The Advanced menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.

Setting incorrect field values may cause the system to malfunction.


## RC ACPI Settings

This section is used to configure ACPI settings.




### Enable Hibernation

Enables or disables system ability to hibernate (OS/S4 Sleep State). This option may not be effective with some OS.

### ACPI Sleep State

Select the highest ACPI sleep state the system will enter when the suspend button is pressed. The options are Suspend Disabled and S3 (Suspend to RAM).

## CPU Configuration

This section is used to configure the CPU.


### Intel® (VMX) Virtualization Technology

Enables or disables Intel Virtualization technology. When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

### Active Processor Cores

Select the number of cores to enable in each processor package.

### Hyper-Threading

Enables or disables Hyper-Threading technology.

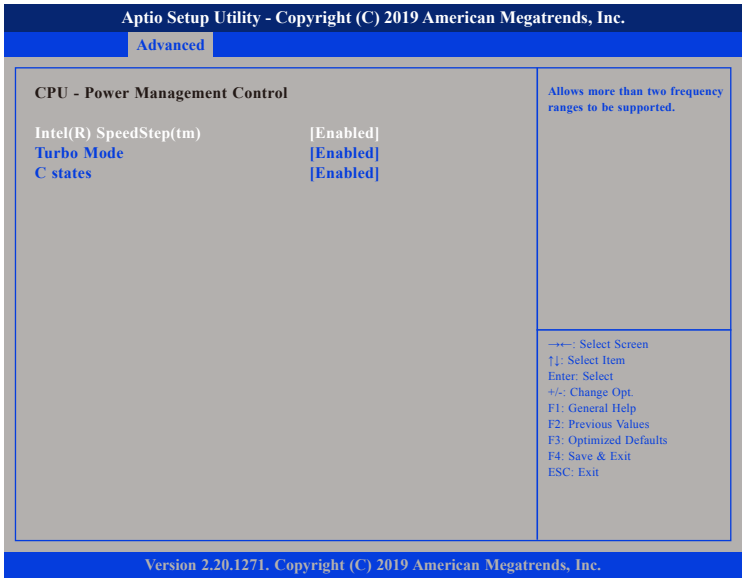
## Power & Performance

This section is used to configure the CPU power management features.


### CPU - Power Management Control

Enters the CPU - Power Management Control submenu.

## CPU - Power Management Control




### Intel® SpeedStep™

Enables or disables Intel SpeedStep.

### Turbo Mode

Enables or disables turbo mode.

### C States

Enables or disables CPU power management. This allows the CPU to go into C states when it is not 100% utilized.

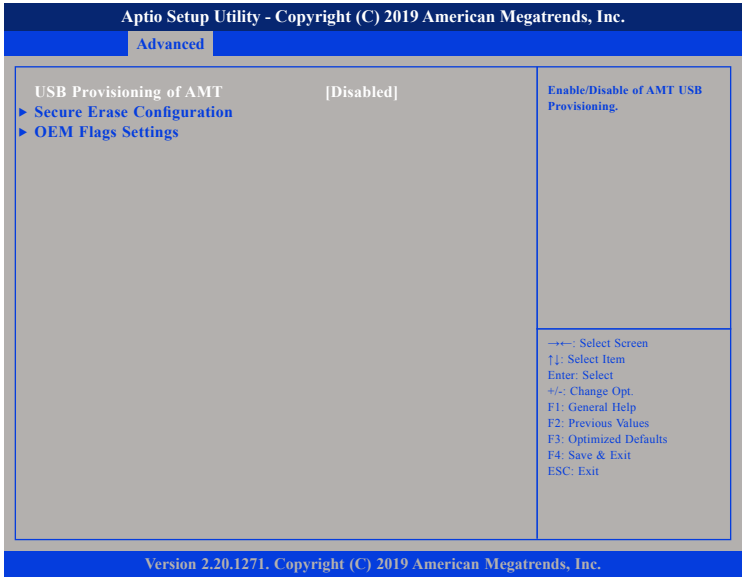
## PCH-FW Configuration

This section is used to configure the firmware update options.


### ME Unconfig on RTC Clear

Enables or disables ME to unconfigure on RTC clear.

## AMT Configuration




**USB Provisioning of AMT**
Enables or disables USB provisioning of AMT.

## Secure Erase Configuration


**Secure Erase mode**
Configures the Secure Erase module behavior.

| | |
|---|---|
| Simulated | Performs SE flow without erasing SSD. |
| Real | Erases SSD. |

**Force Secure Erase**
Enables or disables the option to Force Secure Erase on next boot.

## OEM Flags Settings

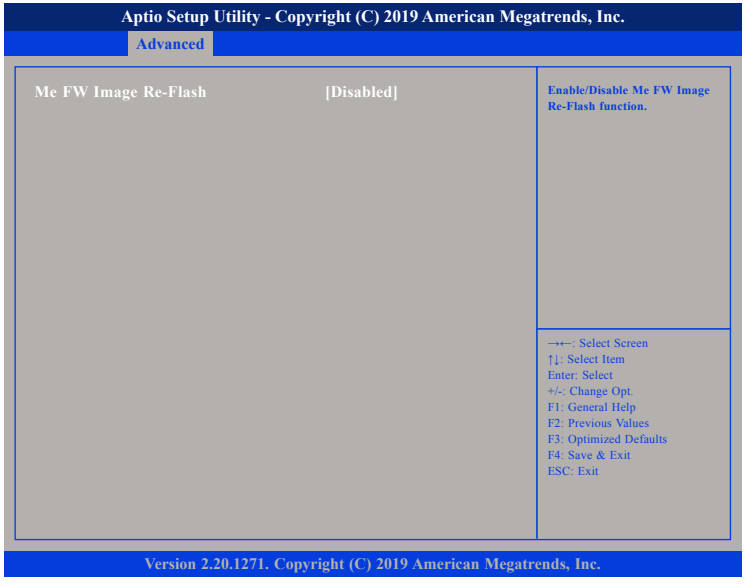

### Hide Unconfigure ME Confirmation Prompt

Enables or disables the option to hide unconfigure ME confirmation prompt when attempting ME unconfiguration.

### Unconfigure ME

Enables or disables Unconfigure ME to reset the MEBx password to default.

## Firmware Update Configuration




### Me FW Image Re-Flash

Enables or disables ME firmware image re-flash function.

## Trusted Computing

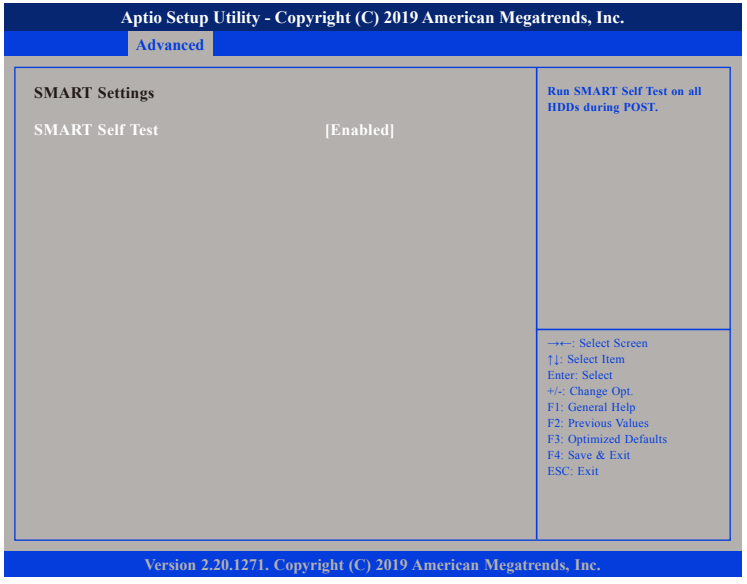
This section is used to configure Trusted Platform Module (TPM) settings.


### 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.

## SMART Settings

This section is used to configure the SMART feature for hard drives.

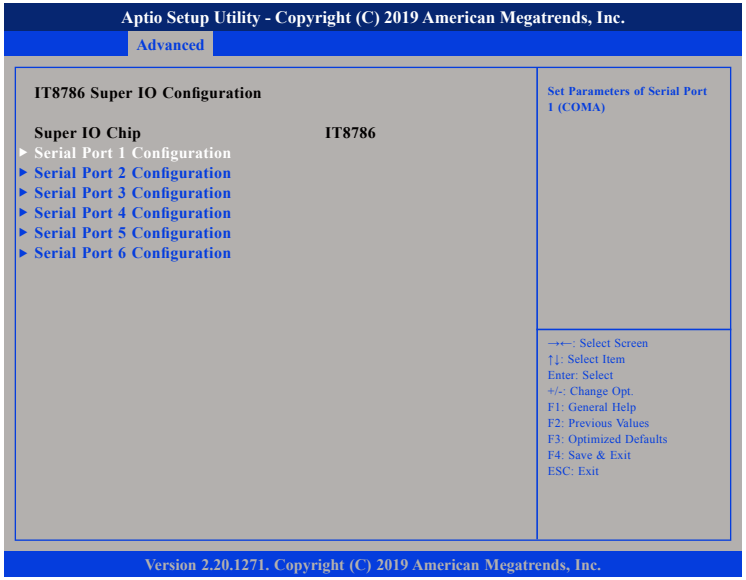



### SMART Self Test

Enables or disables SMART self test on all hard drives during POST.

## IT8786 Super IO Configuration

This section is used to configure serial ports 1 to 6 of the super IO.

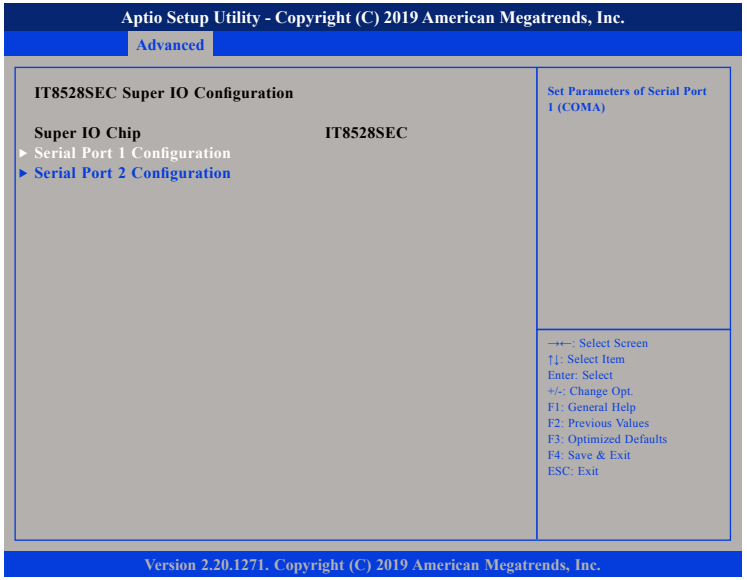



### Super IO Chip

Displays the Super I/O chip used on the board.

## IT8528 Super IO Configuration

This section is used to configure serial ports 1 and 2 of the second super IO.

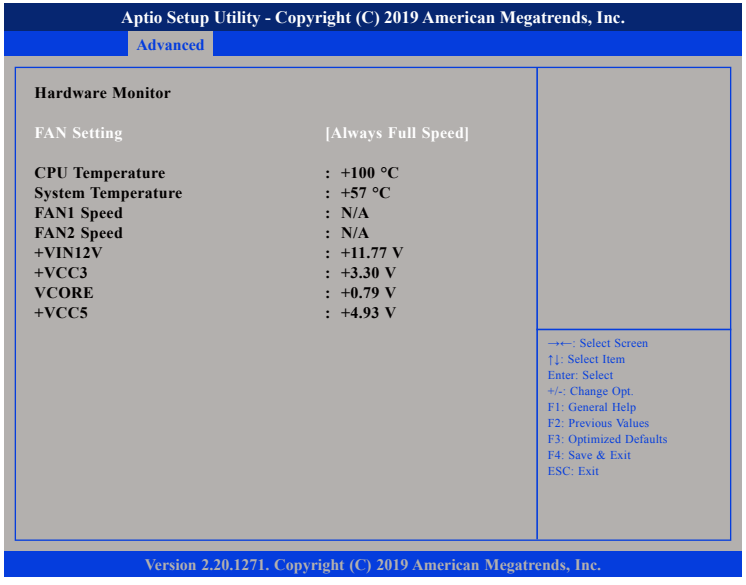



### Super IO Chip

Displays the second Super I/O chip used on the board.

## Hardware Monitor

This section is used to monitor hardware status such as temperature, fan speed and voltages.




**FAN Setting**
Configures the operating mode of the fan. The availabe options are Always Full Speed, Enable Smart Fan and Disable.

**CPU Temperature**
Detects and displays the current CPU temperature.

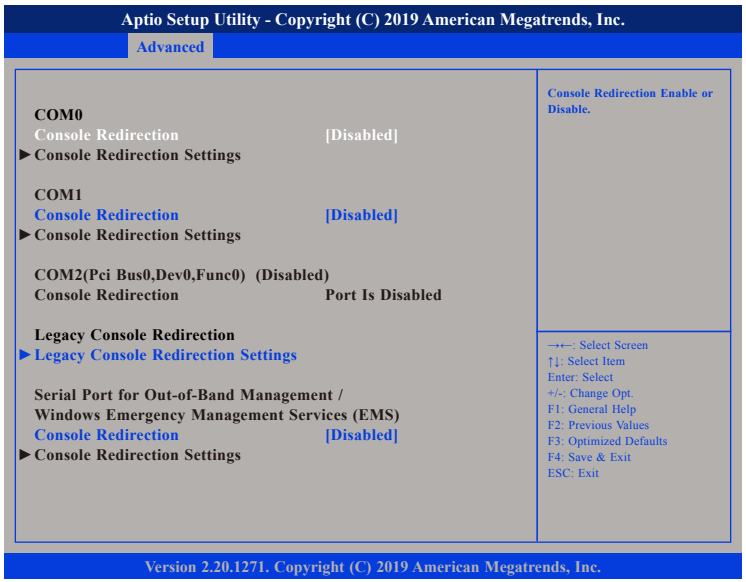
**System Temperature**
Detects and displays the current system temperature.

**FAN1 and FAN2 Speed**
Detects and displays FAN1 and FAN2 speed.

**+VIN12V to +VCC5**
Detects and displays the output voltages.

## Serial Port Console Redirection

This section is used to configure the serial port that will be used for console redirection.

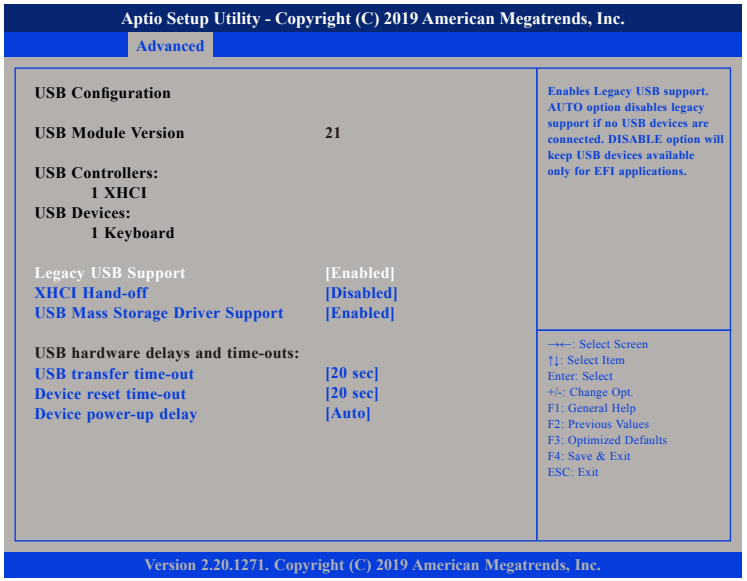



### Console Redirection

Enables or disables console redirection.

## USB Configuration

This section is used to configure the USB.




### Legacy USB Support

Enable Enables Legacy USB.
Auto Disables support for Legacy when no USB devices are connected.
Disable Keeps USB devices available only for EFI applications.

### XHCI Hand-off

This is a workaround for OSs that does not support XHCI hand-off. The XHCI ownership change should be claimed by the XHCI driver respectively.

### USB Mass Storage Driver Support

Enables or disables USB mass storage driver support.

**USB transfer time-out**
The time-out value for control, bulk, and Interrupt transfers.

**Device reset time-out**
Selects the USB mass storage device's start unit command timeout.

**Device power-up delay**
Maximum time the value will take before it properly reports itself to the Host Controller. "Auto" uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor.

## Network Stack Configuration

This section is used to configure the network stack settings.


**Network Stack**
Enables or disables UEFI network stack.

**Ipv4 PXE Support**
Enables or disables IPv4 PXE support. If disabled, the IPv4 boot option will not be created.

**Ipv4 HTTP Support**
Enables or disables IPv4 HTTP support.

**Ipv6 PXE Support**
Enables or disables IPv6 PXE support. If disabled, the IPv6 boot option will not be created.

**Ipv6 HTTP Support**
Enables or disables IPv6 HTTP support.

**IP6 Configuration Policy**
Configures the IP6 configuration policy.

**PXE boot wait time**
Configures the wait time to press the ESC key to abort the PXE boot.

**Media detect count**
Configures the number of times the media will be checked.

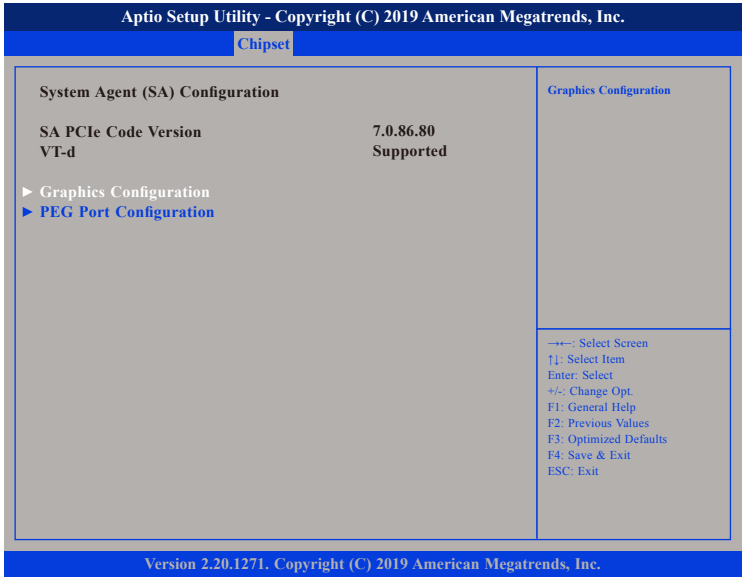
# Chipset

This section is used to configure the system based on the specific features of the chipset.

Setting incorrect field values may cause the system to malfunction.


**LVDS Panel Type**
Configures the LVDS panel resolution.

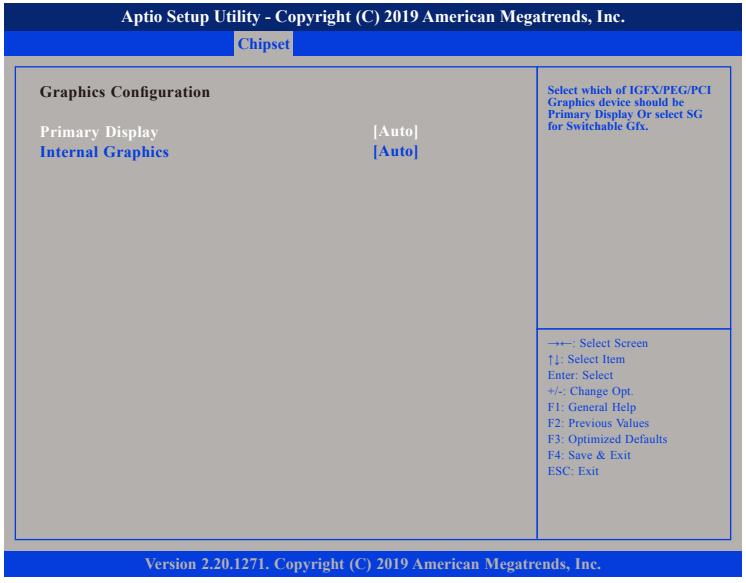
## System Agent (SA) Configuration




**Graphics Configuration**
Enters the graphics chip settings sub-menu.

**PEG Port Configuration**
Enters the PEG port settings sub-menu.

## Graphics Configuration



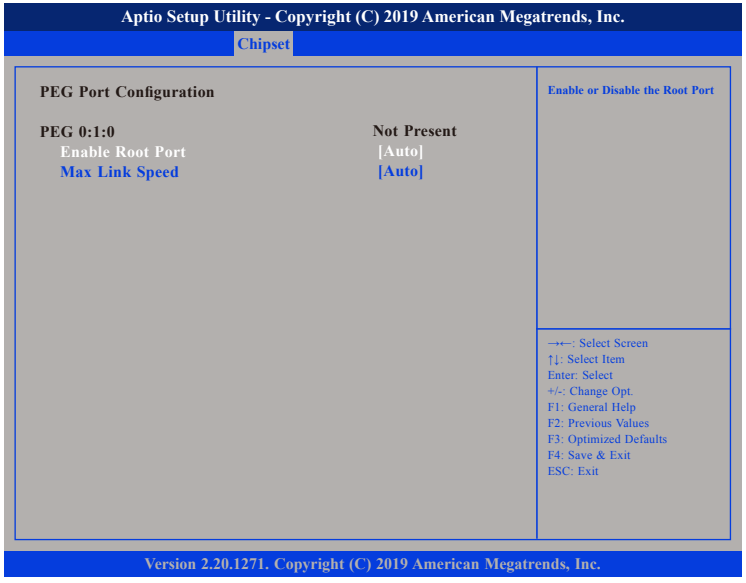

### Primary Display

Select which of IGFX/PEG/PCI graphics device should be the primary display or select SG for switchable GFx.

### Internal Graphics

Keep IGFX enabled based on the setup options.

## PEG Port Configuration



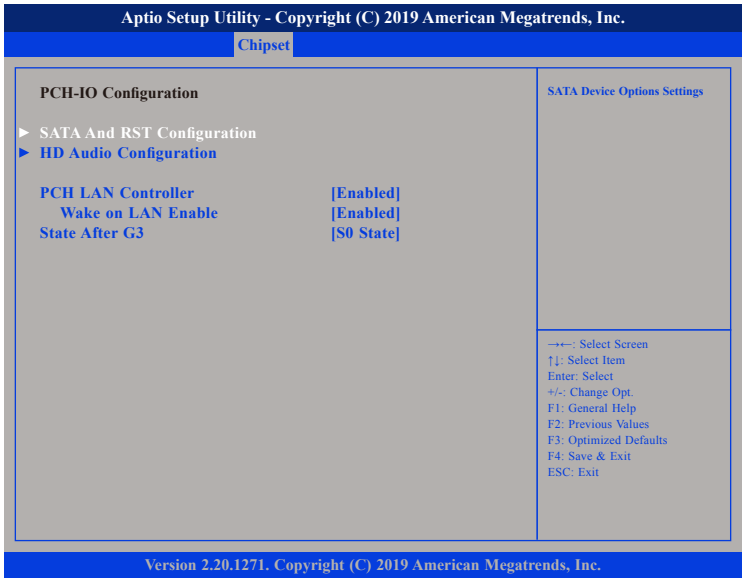

### Enable Root Port

Enables or disables the root port.

### Max Link Speed

Configures the maximum link speed of the PEG device.

## PCH-IO Configuration

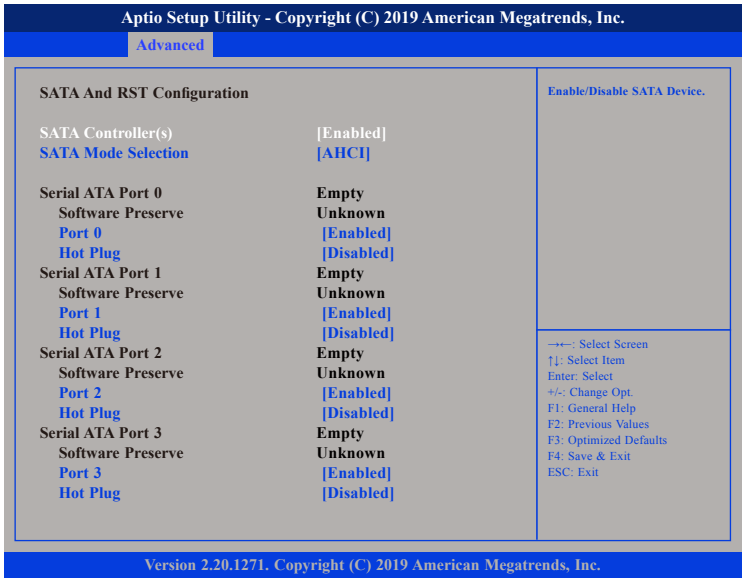



### PCH LAN Controller
Enables or disables onboard NIC.

### Wake on LAN Enable
Enables or disables integrated LAN to wake the system.

### State After G3
Configures the state the system will enter when power is reapplied after a power failure (G3 state).

## SATA And RST Configuration




### SATA Controller(s)
Enables or disables the SATA controller.

### SATA Mode Selection
Configures the SATA as AHCI mode.

### Port 0 to Port 3
Enables or disables SATA port 0, port 1, port 2 or port 3.

### Hot Plug
Enables or disables hot plugging feature on SATA port 0, port 1, port 2 or port 3.

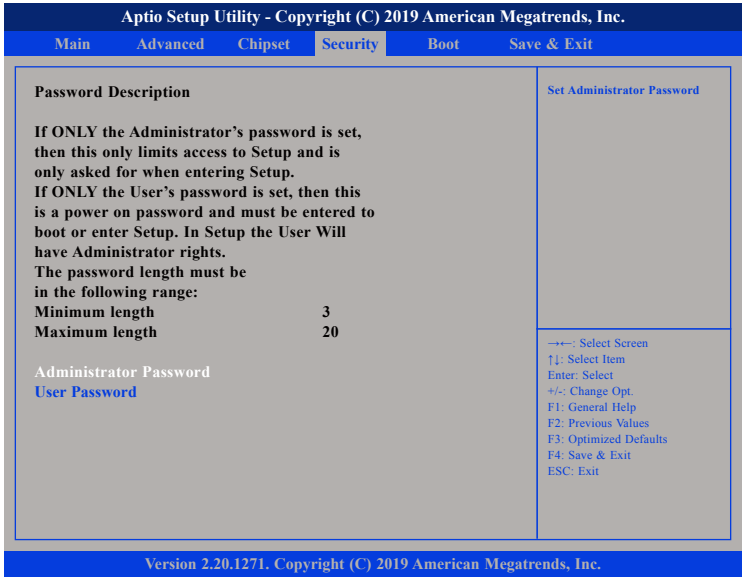
## HD Audio Configuration


### HD Audio

Control detection of the HD audio device.

| | |
|---|---|
| Disabled | HD audio will be unconditionally disabled. |
| Enabled | HD audio will be unconditionally enabled. |
| Auto | HD audio will be enabled if present, disabled otherwise. |

## Security



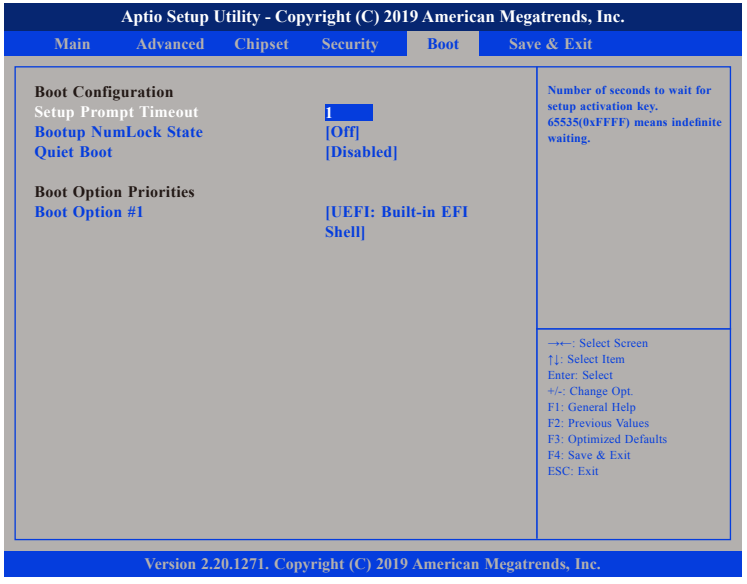

### Administrator Password

Select this to reconfigure the administrator's password.

### User Password

Select this to reconfigure the user's password.

## Boot




### Setup Prompt Timeout

This section configures the number of seconds to wait for the setup activation key.

### Bootup NumLock State

This allows you to determine the default state of the numeric keypad. By default, the system boots up with NumLock on wherein the function of the numeric keypad is the number keys. When set to Off, the function of the numeric keypad is the arrow keys.

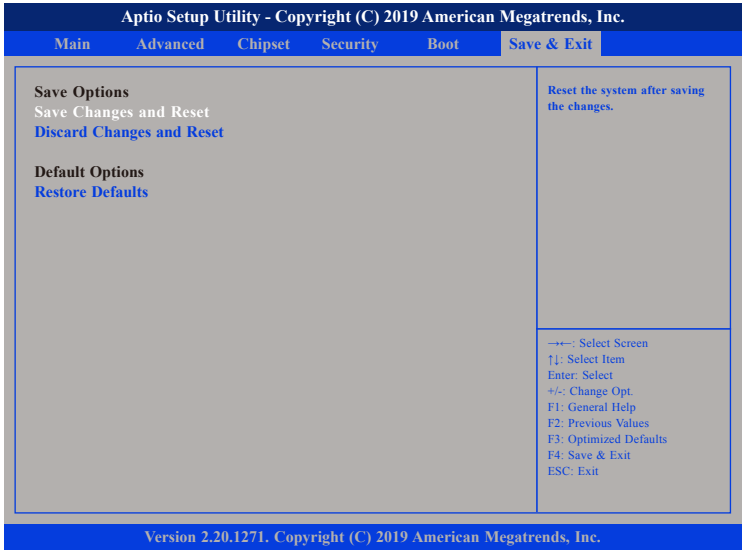
**Quiet Boot**

| | |
|---|---|
| Enabled | Displays OEM logo instead of the POST messages. |
| Disabled | Displays normal POST messages. |

**Boot Option Priorities**

Adjust the boot sequence of the system. Boot Option #1 is the first boot device that the system will boot from, next will be #2 and so forth.

## Save & Exit




**Save Changes and Reset**

To save the changes and reset, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes.

**Discard Changes and Reset**

To exit the Setup utility and reset without saving the changes, select this field then press <Enter>. You may be prompted to confirm again before exiting.

**Restore Defaults**

To restore the BIOS to default settings, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes.