



MODEL:
PUZZLE-A002

**1U Network Appliance with AMD RX-421ND CPU, DDR4,
8 GB eMMC, Six GbE Ports, PCIe x4, PCIe Mini,
M.2, Dual USB 3.1 Gen 1, Rack Mount, and RoHS**

User Manual



Revision

Date	Version	Changes
February 19, 2019	1.00	Initial release



Copyright

COPYRIGHT NOTICE

The information in this document is subject to change without prior notice in order to improve reliability, design and function and does not represent a commitment on the part of the manufacturer.

In no event will the manufacturer be liable for direct, indirect, special, incidental, or consequential damages arising out of the use or inability to use the product or documentation, even if advised of the possibility of such damages.

This document contains proprietary information protected by copyright. All rights are reserved. No part of this manual may be reproduced by any mechanical, electronic, or other means in any form without prior written permission of the manufacturer.

TRADEMARKS

All registered trademarks and product names mentioned herein are used for identification purposes only and may be trademarks and/or registered trademarks of their respective owners.

Manual Conventions

**WARNING**

Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously.

**CAUTION**

Cautionary messages should be heeded to help reduce the chance of losing data or damaging the product.

**NOTE**

These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can help avoid making mistakes.

Table of Contents

1 INTRODUCTION.....	1
1.1 OVERVIEW.....	2
1.2 MODEL VARIATIONS	2
1.3 FEATURES.....	3
1.4 FRONT PANEL	3
1.5 REAR PANEL.....	4
1.6 TECHNICAL SPECIFICATIONS	4
1.7 DIMENSIONS.....	6
2 UNPACKING	7
2.1 ANTI-STATIC PRECAUTIONS	8
2.2 UNPACKING PRECAUTIONS.....	8
2.3 PACKING LIST.....	9
2.4 OPTIONAL ITEMS	10
3 INSTALLATION	11
3.1 INSTALLATION PRECAUTIONS	12
3.2 TOP COVER REMOVAL	13
3.3 DIMM INSTALLATION	13
3.4 HDD INSTALLATION.....	15
3.5 PCIe EXPANSION CARD INSTALLATION	17
3.6 M.2 MODULE INSTALLATION.....	20
3.7 PCIe MINI CARD INSTALLATION	21
3.7.1 Half-size PCIe Mini Card Installation.....	22
3.8 LAN CONNECTION.....	23
3.9 CONSOLE CONNECTION.....	24
3.10 MOUNTING THE SYSTEM	24
3.11 POWER-ON PROCEDURE.....	25
3.12 AVAILABLE DRIVERS	26
3.12.1 Driver Download	27
4 BIOS	29



4.1 INTRODUCTION.....	30
4.1.1 Starting Setup.....	30
4.1.2 Using Setup.....	30
4.1.3 Getting Help.....	31
4.1.4 Unable to Reboot after Configuration Changes.....	31
4.1.5 BIOS Menu Bar.....	31
4.2 MAIN.....	32
4.3 ADVANCED.....	33
4.3.1 Trusted Computing.....	34
4.3.1 IDE Configuration.....	35
4.3.2 iWDD H/W Monitor.....	36
4.3.2.1 Smart Fan Mode Configuration.....	37
4.3.3 iWDD Super IO Configuration.....	39
4.3.3.1 Serial Port 1 Configuration.....	39
4.3.4 Serial Port Console Redirection.....	41
4.3.5 CPU Configuration.....	43
4.3.5.1 Node 0 Information.....	44
4.3.6 NVMe Configuration.....	45
4.4 CHIPSET.....	45
4.4.1 South Bridge.....	46
4.4.1.1 SB SATA Configuration.....	47
4.4.2 GFX Configuration.....	48
4.4.3 North Bridge.....	49
4.4.3.1 Socket 0 Information.....	49
4.5 SECURITY.....	50
4.6 BOOT.....	51
4.7 SAVE & EXIT.....	53
5 INTERFACE CONNECTORS.....	54
5.1 PERIPHERAL INTERFACE CONNECTORS.....	55
5.2 INTERNAL PERIPHERAL CONNECTORS.....	56
5.2.1 ATX Power Connector (ATXPWR1).....	57
5.2.2 Chassis Intrusion Connector (CHASSIS1).....	57
5.2.3 DIO Connector (DIO1).....	57
5.2.4 EC Debug Connector (CN1).....	58



PUZZLE-A002

5.2.5 Fan Connectors (CPU_FAN1/2/3, SYS_FAN1)	58
5.2.6 Front Panel Connector (F_PANEL1).....	59
5.2.7 LCM Connector (LCM_CON1)	59
5.2.1 M.2 Slot (M2_CN1).....	60
5.2.2 PCIe Mini Card Slot (MPCIE1).....	61
5.2.1 Power Switch Connector (PWR_BTN1)	62
5.2.2 SATA Connector (SATA0_1).....	62
5.2.3 SPI Flash Connector (JSPI_BIOS_1).....	63
5.2.4 SPI Flash Connector - EC (JSPI_EC1).....	63
5.2.5 TPM Connector (TPM1).....	64
5.2.6 USB 2.0 Connector (USB_CON2).....	64
5.2.7 USB DOM Connector (USB_DOM1)	64
A REGULATORY COMPLIANCE	65
B SAFETY PRECAUTIONS	70
B.1 SAFETY PRECAUTIONS.....	71
B.1.1 General Safety Precautions	71
B.1.2 Anti-static Precautions	71
B.1.3 Product Disposal	72
B.2 MAINTENANCE AND CLEANING PRECAUTIONS	73
B.2.1 Maintenance and Cleaning.....	73
B.2.2 Cleaning Tools.....	73
C HAZARDOUS MATERIALS DISCLOSURE	75



List of Figures

Figure 1-1: PUZZLE-A002 Series.....	2
Figure 1-2: PUZZLE-A002 Front Panel.....	3
Figure 1-3: PUZZLE-A002 Rear Panel.....	4
Figure 1-4: Physical Dimensions (millimeters).....	6
Figure 3-1: Top Cover Removal	13
Figure 3-2: DIMM Slot Locations.....	14
Figure 3-3: HDD Bracket Retention Screws.....	15
Figure 3-4: Secure HDD to the Bracket	16
Figure 3-5: HDD Installation	16
Figure 3-6: Expansion Slot Module Retention Screws	17
Figure 3-7: Disconnect the Expansion Slot Module.....	18
Figure 3-8: Blank Bracket Screw.....	18
Figure 3-9: PCIe Expansion Card Installation.....	19
Figure 3-10: Expansion Slot Module Installation	20
Figure 3-11: PCIe Mini Slot Location	22
Figure 3-12: RJ-45 Ethernet Connector.....	23
Figure 3-13: Rack Mounting Bracket Installation	24
Figure 3-14: Power-on.....	25
Figure 3-15: IEI Resource Download Center.....	26

List of Tables

Table 1-1: PUZZLE-A002 Model Variations	2
Table 1-2: Technical Specifications.....	6
Table 3-1: LAN Pinouts	23
Table 3-2: RJ-45 Ethernet Connector LEDs	23
Table 3-3: RJ-45 Serial Port Pinouts.....	24
Table 4-1: BIOS Navigation Keys	31
Table 5-1: Peripheral Interface Connectors	56
Table 5-2: ATX Power Connector (ATXPWR1) Pinouts	57
Table 5-3: Chassis Intrusion Connector (CHASSIS1) Pinouts.....	57
Table 5-4: DIO Connector (DIO1) Pinouts	57
Table 5-5: EC Debug Connector (CN1) Pinouts.....	58
Table 5-6: Fan Connectors (CPU_FAN1/2/3, SYS_FAN1) Pinouts.....	58
Table 5-7: Front Panel Connector (F_PANEL1) Pinouts.....	59
Table 5-8: LCM Connector (LCM_CON1) Pinouts	59
Table 5-9: M.2 Slot (M2_CN1) Pinouts	61
Table 5-10: PCIe Mini Card Slot (MPCIE1) Pinouts	62
Table 5-11: Power Switch Connector (PWR_BTN1) Pinouts.....	62
Table 5-12: SATA 6Gb/s Connector (SATA0_1) Pinouts	63
Table 5-13: SPI Flash Connector (JSPI_BIOS_1) Pinouts	63
Table 5-14: SPI Flash Connector - EC (JSPI_EC1) Pinouts.....	63
Table 5-15: TPM Connector (TPM1) Pinouts.....	64
Table 5-16: USB 2.0 Connector (USB_CON2) Pinouts.....	64
Table 5-17: USB DOM Connector (USB_DOM1) Pinouts	64

Chapter

1

Introduction

1.1 Overview



Figure 1-1: PUZZLE-A002 Series

The PUZZLE-A002 is a 1U network appliance series powered by AMD RX-421ND processor. It is optimized to host VNFs (Virtual Network Functions) and is ideal for SD-WAN.

The PUZZLE-A002 supports six copper GbE ports for high-speed network applications, and it is equipped with two PCIe x4 slots for upgrading with expansion cards, such as NIC cards or accelerator cards.

Multiple storage interfaces for fast and stable data transmission are offered through two SATA 6Gb/s connectors and one PCIe Mini slot that supports mSATA module.

1.2 Model Variations

The model variations of the PUZZLE-A002 are listed below.

Model No.	CPU	Memory	SSD
PUZZLE-A002-MF1	AMD RX-421ND	N/A	N/A
PUZZLE-A002-MF1/8G	AMD RX-421ND	8 GB DDR4	256 GB

Table 1-1: PUZZLE-A002 Model Variations

PUZZLE-A002

1.3 Features

The PUZZLE-A002 features are listed below:

- Powered by AMD RX-421ND processor (quad-core, up to 3.4 GHz)
- Support two 2400 MHz DDR4 non-ECC RDIMMs (system max. 32 GB)
- Support two 2.5" SATA SSD/HDD
- Support up to six GbE connections via Broadcom BCM5720 controllers
- Upgradable with future expansion cards by two PCIe x4 slots, one M.2 slot and one PCIe Mini card slot
- One RJ-45 RS-232 serial port
- Supports two USB 3.1 Gen 1 (5 Gb/s) ports
- 1U chassis for rack mounting
- RoHS compliant

1.4 Front Panel

The overview of the front panel is shown in **Figure 1-2**.

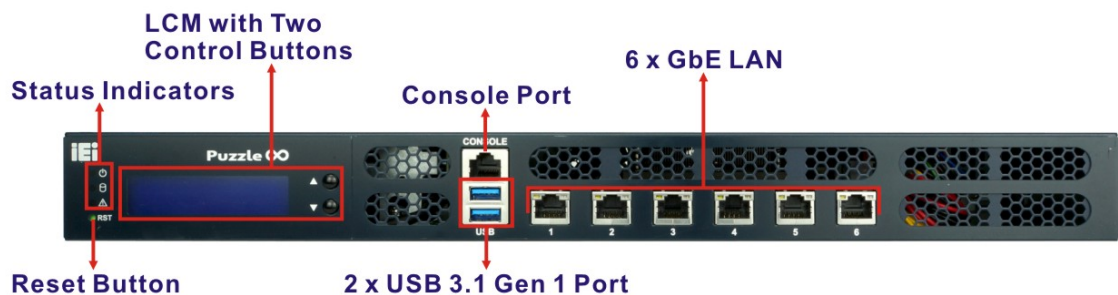


Figure 1-2: PUZZLE-A002 Front Panel

The states of the LED indicators located on the front panel are listed below.

 Power LED	Off	The system is turned off.
	Blue	The system is turned on.
 HDD Status LED	Off	No HDD activity
	Blinking Blue	HDD activity
 Alert LED	Off	No alert
	Red	Alert message

1.5 Rear Panel

An overview of the PUZZLE-A002 rear panel is shown in **Figure 1-3** below.

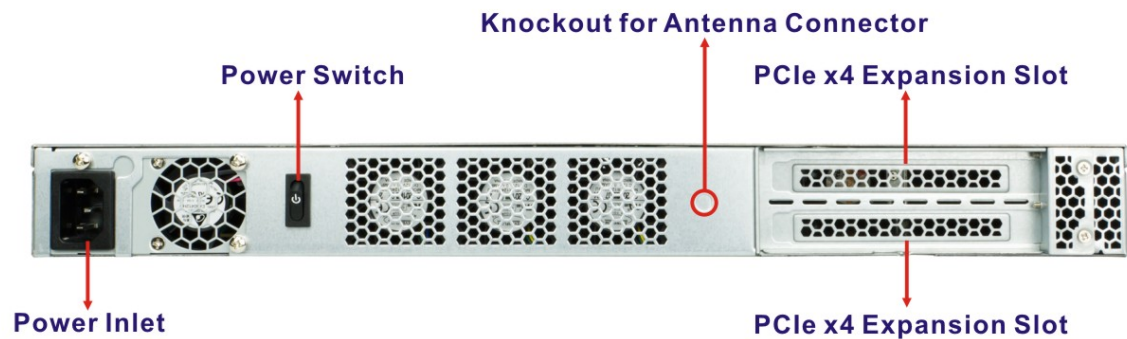


Figure 1-3: PUZZLE-A002 Rear Panel

1.6 Technical Specifications

The PUZZLE-A002 technical specifications are listed below.

System	
Form Factor	1U
CPU (SoC)	AMD RX-421ND processor (quad-core, up to 3.4 GHz)
Memory	Two 288-pin 2400 MHz DDR4 ECC/non-ECC RDIMM slots (system max. 32 GB) (8G SKUs are pre-installed with two 4 GB memory modules)
Networking	Broadcom BCM5720 Ethernet controllers 6 x Copper 1GbE LAN port
Network Acceleration and Security	AES-NI encryption acceleration AMD Secure Processor Secure boot with AMD Hardware Validated Boot (HVB)
Storage	2 x 2.5" SATA 6Gb/s HDD/SSD bay 8 GB eMMC
Expansion	
PCIe	1 x PCIe x4 slot 1 x PCIe x16 slot (x4 mode)

PUZZLE-A002

PCIe Mini	1 x PCIe Mini slot (reserved for WWAN module, supports PCIe and USB 2.0 signals)
M.2	1 x M.2 A-key 2230 slot (reserved for Wi-Fi module, supports PCIe and USB 2.0 signals)
I/O and Indicators	
Console	1 x RJ-45 RS-232
USB	2 x USB 3.1 Gen 1 (5 Gb/s) port (external) 2 x USB 3.1 Gen 1 (5 Gb/s) port (internal, Type-A) 2 x USB 2.0 internal pin-header (8-pin, p=2.54)
Indicator	LCM (with two control buttons) Power status (blue) HDD status (green) Alert LED (programmable, red)
Switch/Button	Power switch (rear panel) Reset button (front panel)
TPM	1 x TPM 2.0 (2x10 pin header)
Antenna Connector	1 x Knockout hole for antenna connector
Power	
Power Input	100 V ~ 240 V ATX power, 250 W
Thermal Solution	1 x Passive heatsink for CPU 4 x Smart fan
Environmental and Mechanical	
Mounting	1U rack mount
Operating Temperature	0°C~40°C (32°F~104°F)
Storage Temperature	-10°C~50°C (14°F~122°F)
Operating Humidity	5%~90%, non-condensing
Safety	CE, FCC
Weight	5 kg
Physical Dimensions	430 mm x 320 mm x 44.2 mm (W x D x H)

Operating System	Linux Ubuntu 16.04
------------------	--------------------

Table 1-2: Technical Specifications

1.7 Dimensions

The physical dimensions are shown below:

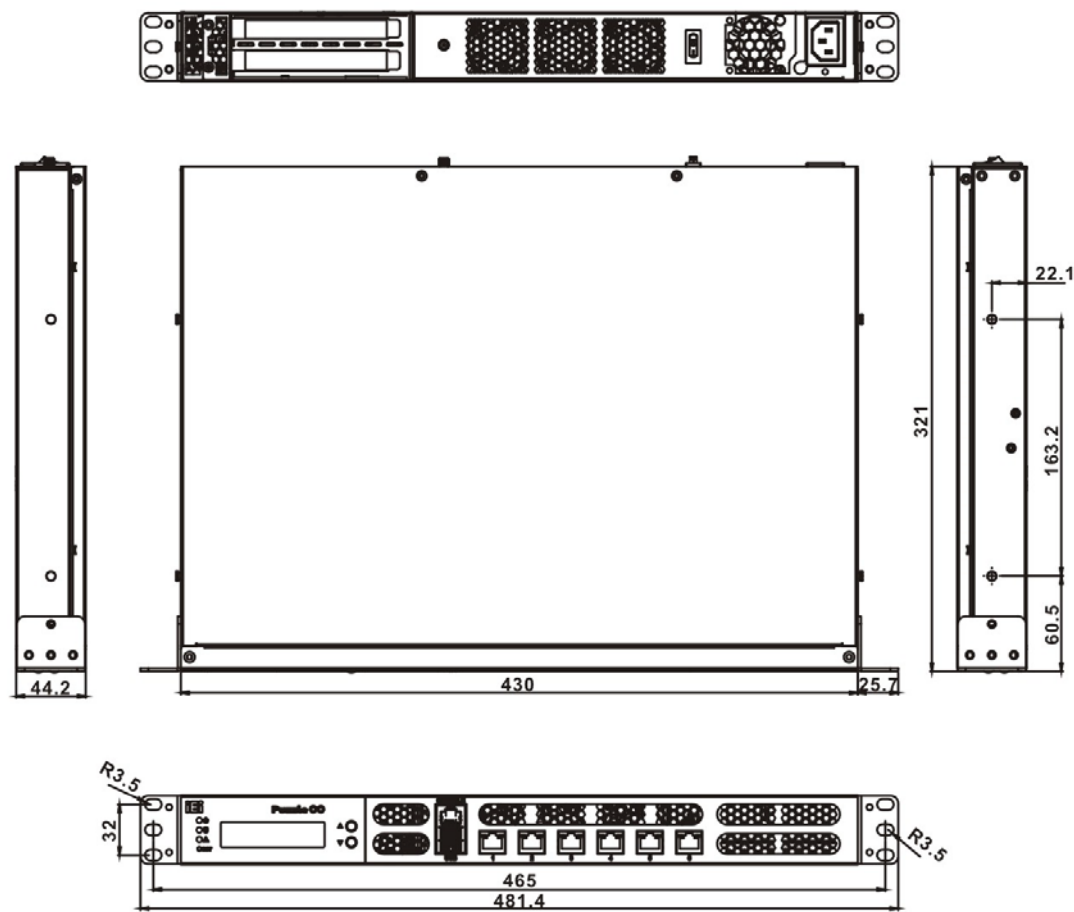


Figure 1-4: Physical Dimensions (millimeters)

Chapter

2

Unpacking

2.1 Anti-static Precautions



WARNING:

Failure to take ESD precautions during installation may result in permanent damage to the PUZZLE-A002 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the PUZZLE-A002. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the PUZZLE-A002 or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband:*** Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding:*** Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad:*** When configuring the PUZZLE-A002, place it on an anti-static pad. This reduces the possibility of ESD damaging the PUZZLE-A002.

2.2 Unpacking Precautions

When the PUZZLE-A002 is unpacked, please do the following:


- Follow the anti-static precautions outlined in **Section 2.1**.
- Make sure the packing box is facing upwards so the PUZZLE-A002 does not fall out of the box.
- Make sure all the components shown in **Section 2.3** are present.

PUZZLE-A002**2.3 Packing List****NOTE:**

If some of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the PUZZLE-A002 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@ieiworld.com.





The PUZZLE-A002 is shipped with the following components:

Quantity	Item	Image
1	PUZZLE-A002	
1	Power cord	
2	Rack mounting bracket	
6	Mounting bracket screw (M4*6)	
10	Screw for securing HDD (M3*4)	
1	USB to console cable (only for SKUs with memory)	

Quantity	Item	Image
1	RS-232 to console cable (only for SKUs without memory)	

2.4 Optional Items

The following table lists the optional items that can be purchased separately.

Optional Item	Image
Slide rail (P/N: RAIL-B02)	
USB to console cable (P/N: 32013-004000-100-RS)	
RS-232 to console cable (P/N: 32005-005100-100-RS)	
20-pin Infineon TPM 2.0 module, software management tool, firmware v5.5 (P/N: TPM-IN02-R20)	

Chapter

3

Installation

3.1 Installation Precautions

During installation, be aware of the precautions below:

- **Read the user manual:** The user manual provides a complete description of the PUZZLE-A002, installation instructions and configuration options.
- **DANGER! Disconnect Power:** Power to the PUZZLE-A002 must be disconnected during the installation process. Failing to disconnect the power may cause severe injury to the body and/or damage to the system.
- **Qualified Personnel:** The PUZZLE-A002 must be installed and operated only by trained and qualified personnel. Maintenance, upgrades, or repairs may only be carried out by qualified personnel who are familiar with the associated dangers.
- **Air Circulation:** Make sure there is sufficient air circulation when installing the PUZZLE-A002. The PUZZLE-A002's cooling vents must not be obstructed by any objects. Blocking the vents can cause overheating of the PUZZLE-A002. Leave at least 5 cm of clearance around the PUZZLE-A002 to prevent overheating.
- **Grounding:** The PUZZLE-A002 should be properly grounded. The voltage feeds must not be overloaded. Adjust the cabling and provide external overcharge protection per the electrical values indicated on the label attached to the back of the PUZZLE-A002.

PUZZLE-A002

3.2 Top Cover Removal

Before installing or maintaining the internal components, the top cover must be removed from the PUZZLE-A002. Follow the steps below to complete the task.

Step 1: Remove the four retention screws indicated in **Figure 3-1**.

Step 2: Slide the top cover towards the rear side and gently lift the top cover (Figure 3-1).



Figure 3-1: Top Cover Removal

3.3 DIMM Installation



CAUTION:

For dual channel configuration, always install two identical memory modules that feature the same capacity, timings, voltage, number of ranks and the same brand.

To install the DIMM module, please follow the steps below.

Step 1: Remove the top cover from the PUZZLE-A002. Please follow the instruction described in **Section 3.2**.

Step 2: Locate the DIMM slots on the motherboard.



Figure 3-2: DIMM Slot Locations

Step 3: Open the DIMM socket handles. Open the two handles outwards as far as they can.

Step 4: Align the DIMM so the notch on the memory lines up with the notch on the memory socket.

Step 5: Once aligned, press down until the DIMM is properly seated. Clip the two handles into place.

Step 6: To remove a DIMM, push both handles outward. The memory module is ejected by a mechanism in the socket.

PUZZLE-A002**3.4 HDD Installation**

The PUZZLE-A002 allows installation of two 2.5" SATA HDD/SSD. To install HDDs into the system, please follow the steps below.

Step 1: Remove the top cover from the PUZZLE-A002. Please follow the instruction described in **Section 3.2**.

Step 2: Remove the HDD bracket from the system. To do this, remove the three retention screws indicated below and disconnect the SATA connector module from the motherboard.

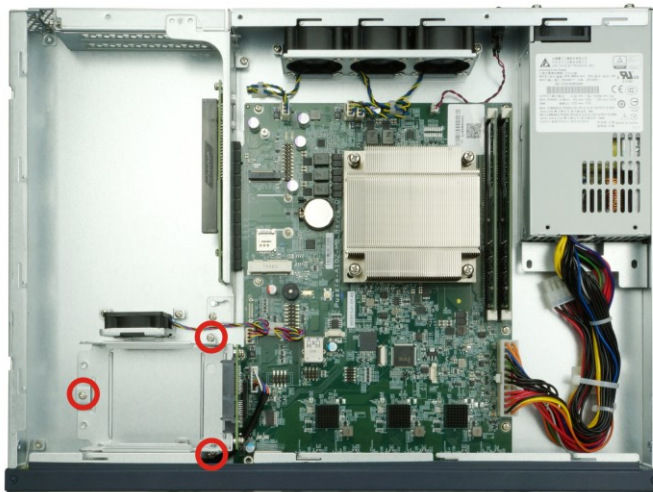


Figure 3-3: HDD Bracket Retention Screws

Step 3: Insert an HDD into the bracket until the HDD is properly connected to the SATA connector. Secure the HDD with four retention screws (M3*4). See **Figure 3-5**.

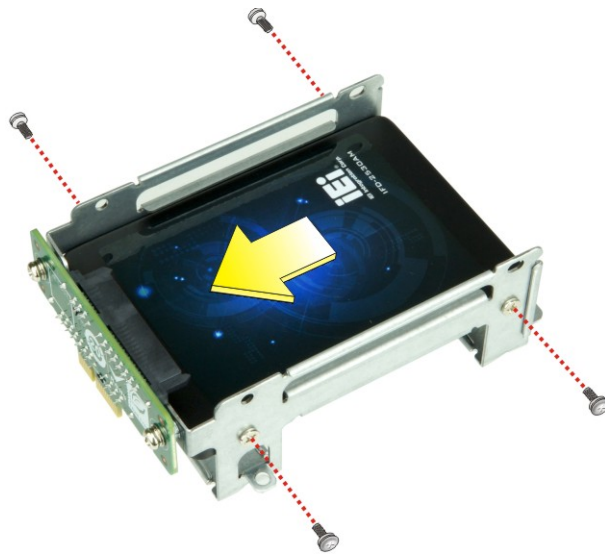


Figure 3-4: Secure HDD to the Bracket

Step 4: Re-connect the SATA connector module to the motherboard. Secure the bracket to the chassis with three screws removed previously (**Figure 3-5**).

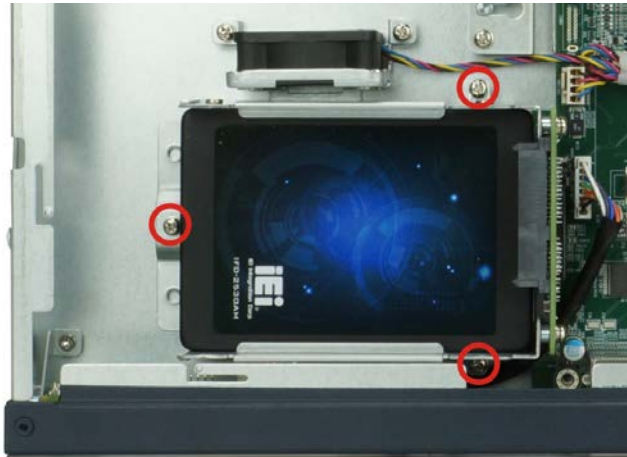


Figure 3-5: HDD Installation

Step 5: Re-install and secure the top cover to the system.

PUZZLE-A002

3.5 PCIe Expansion Card Installation

The PUZZLE-A002 allows installation of two PCIe x4 cards. To install a PCIe expansion card, please follow the steps below.

Step 1: Remove the top cover from the PUZZLE-A002 (refer to **Section 3.2**).

Step 2: Remove the four expansion slot module retention screws indicated below.

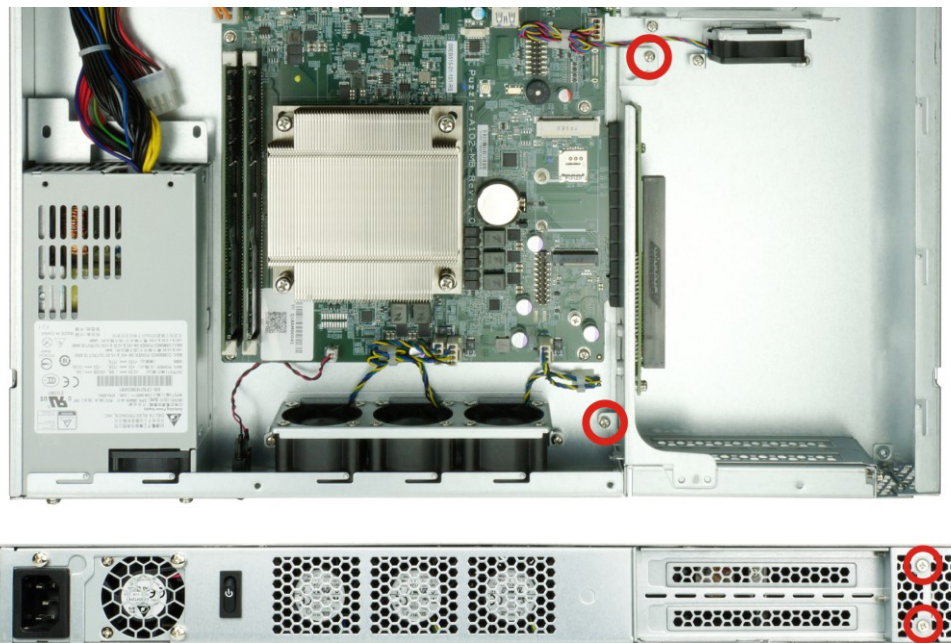


Figure 3-6: Expansion Slot Module Retention Screws

Step 3: Push the expansion slot module with strength to disconnect the module from the edge connector of the motherboard.



Figure 3-7: Disconnect the Expansion Slot Module

Step 4: Remove the blank bracket panel that aligns with the PCIe slot for installing the expansion card. Save the bracket screw.

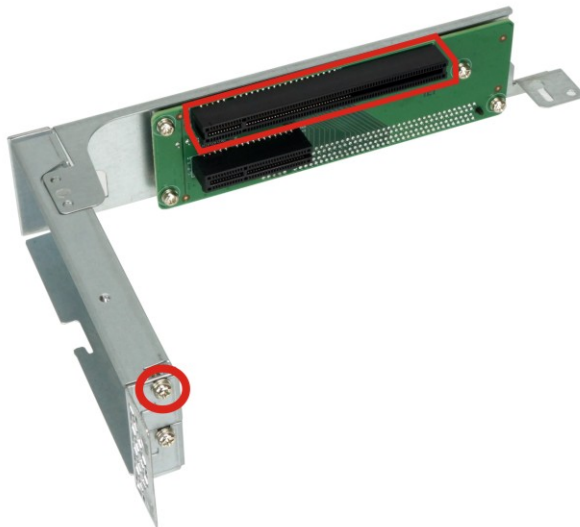


Figure 3-8: Blank Bracket Screw

PUZZLE-A002

Step 5: Align the expansion card to the PCIe slot. Press gently, but firmly, to seat the expansion card correctly in the slot. Install the bracket screw to secure the card to the expansion slot module.



Figure 3-9: PCIe Expansion Card Installation

Step 6: Place the expansion slot module back to the original position by hooking the slotted hole into the positioning stud in the chassis (**Figure 3-10 “A”**). Push the connector of the expansion slot module into the edge connector to install it.

During installation, ensure that

1. the connector on the slot module is properly aligned and connected to the edge connector;
2. the two studs on the side is going through the two holes in the chassis;
3. the slot module tab is going under the chassis tab.

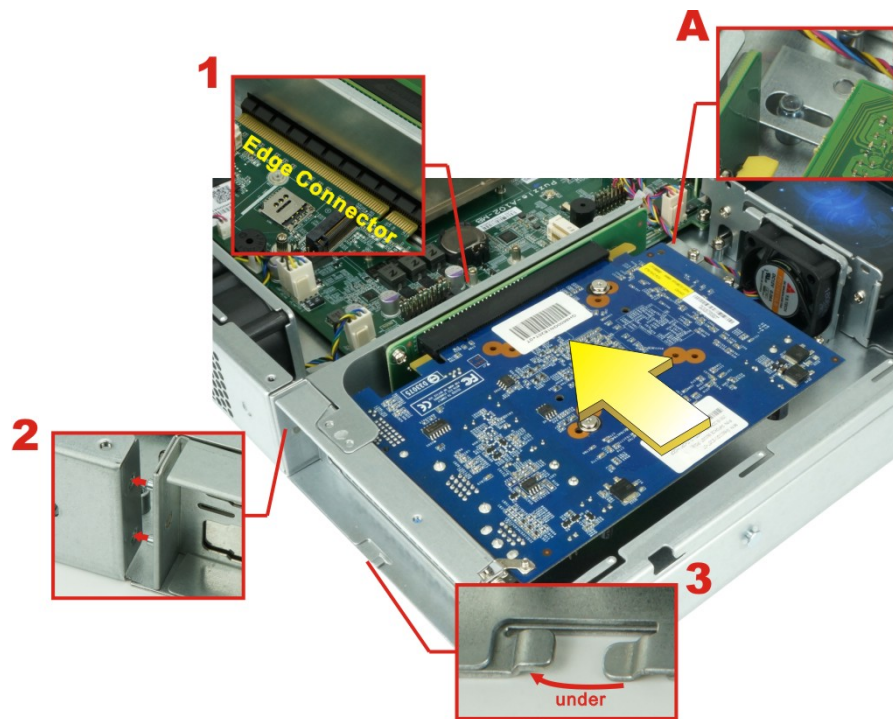


Figure 3-10: Expansion Slot Module Installation

Step 7: Secure the expansion slot module with the four retention screws previously removed.

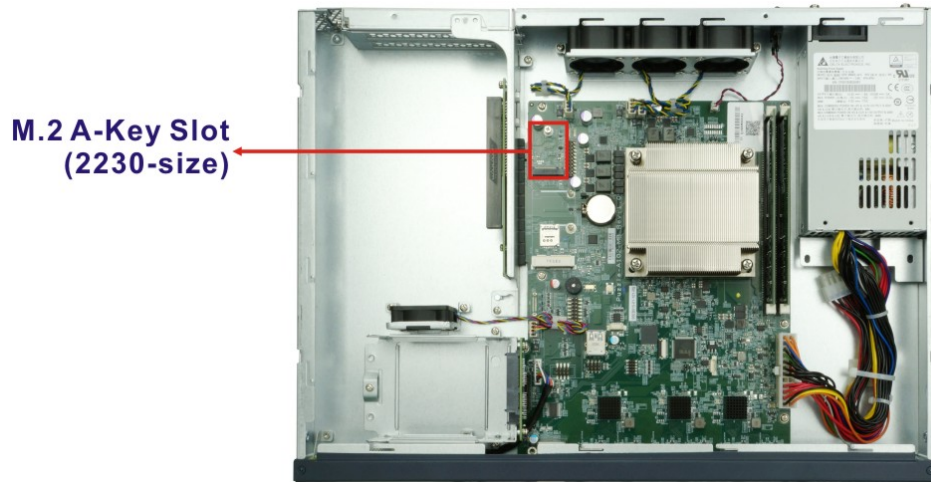
Step 8: Re-install the top cover.

3.6 M.2 Module Installation

The M.2 slot is keyed in the A position and provides mounting screw position for 2230-size M.2 module. To install an M.2 module, please follow the steps below.

Step 1: Remove the top cover from the PUZZLE-A002. See **Section 3.2**.

Step 2: Locate the M.2 slot on the motherboard.

PUZZLE-A002

Step 3: Remove the on-board retention screw.

Step 4: Line up the notch on the module with the notch on the slot. Slide the M.2 module into the socket at an angle of about 20°.

Step 5: Push the M.2 module down and secure it with the previously removed retention screw.

3.7 PCIe Mini Card Installation

The PUZZLE-A002 has one full-size/half-size PCIe Mini slot on the motherboard. To install a full-size module, follow the instructions below.

Step 1: Remove the top cover from the PUZZLE-A002. See **Section 3.2**.

Step 2: Locate the PCIe Mini slot on the motherboard (Figure 3-11).

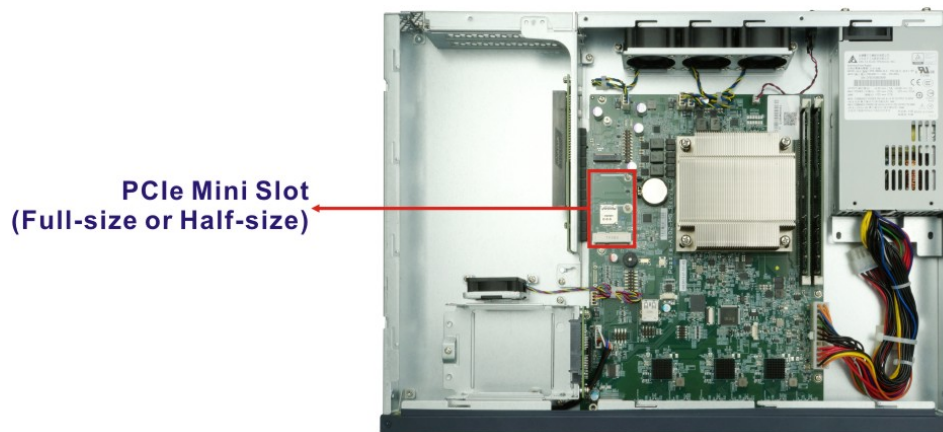


Figure 3-11: PCIe Mini Slot Location

- Step 3:** Remove the retention screw and standoff for half-size PCIe Mini card to avoid interference of the board circuit.
- Step 4:** Remove the pre-installed retention screw for full-size card from the standoff.
- Step 5:** Line up the notch on the card with the notch on the slot. Slide the PCIe Mini card into the socket at an angle of about 20°.
- Step 6:** Secure the full-size PCIe Mini card with the retention screw previously removed.

3.7.1 Half-size PCIe Mini Card Installation

The PCIe Mini slot also allows installation of a half-size PCIe Mini card. To install a half-size PCIe Mini card, please follow the steps below.

- Step 1:** Remove the pre-installed retention screw for half-size PCIe Mini card from the standoff.
- Step 2:** Line up the notch on the card with the notch on the slot. Slide the PCIe Mini card into the socket at an angle of about 20°.
- Step 3:** Secure the half-size PCIe Mini card with the retention screw previously removed.

PUZZLE-A002

3.8 LAN Connection

The LAN connectors on the front panel allow connection to an external network. The pinouts of the LAN connectors are listed below.

Pin	Description	Pin	Description
1	MDIA0+	5	MDIA2-
2	MDIA0-	6	MDIA1-
3	MDIA1+	7	MDIA3+
4	MDIA2+	8	MDIA3-

Table 3-1: LAN Pinouts

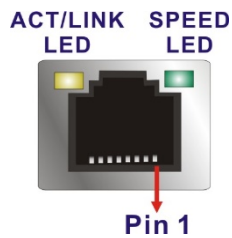


Figure 3-12: RJ-45 Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one yellow and one green/orange. The yellow LED indicates activity on the port and the green/orange LED indicates the speed. See **Table 3-2**.

Activity/Link LED		Speed LED	
STATUS	DESCRIPTION	STATUS	DESCRIPTION
Off	No link	Off	10 Mbps connection
Yellow	Linked	Green	100 Mbps connection
Blinking	TX/RX activity	Orange	1 Gbps connection

Table 3-2: RJ-45 Ethernet Connector LEDs

3.9 Console Connection

The PUZZLE-A002 has one RJ-45 serial device connector on the front panel. The RJ-45 connector for the serial port can be identified easily as the RJ-45 for the network has two LEDs on the port, while the connectors for the serial cables don't. The pinouts of the serial port are listed below.

Pin	Description	Pin	Description
1	-NRTS1	5	GND
2	-NDTR1	6	NSIN1
3	NSOUT1	7	-NDSR1
4	GND	8	-NCTS1

Table 3-3: RJ-45 Serial Port Pinouts

The serial device slot (RJ-45) connects to a cable with a standard D-sub 9 connector or a USB connector (varied from SKU) at the other end.

3.10 Mounting the System

The PUZZLE-A002 is shipped with two mounting brackets that support 1U rack mount. To install the mounting brackets, please follow the steps below.

- Step 1: Align the three retention screw holes in each bracket with the corresponding retention screw holes on the sides of the PUZZLE-A002.
- Step 2: Secure the brackets to the system by inserting three retention screws (M4*6) into each bracket (Figure 3-13). Make sure the screws are tight and on the right positions.



Figure 3-13: Rack Mounting Bracket Installation

PUZZLE-A002

3.11 Power-On Procedure

**WARNING:**

Make sure a power supply with the correct input voltage is being fed into the system. Incorrect voltages applied to the system may cause damage to the internal electronic components and may also cause injury to the user.

To power-on the PUZZLE-A002 please follow the steps below:

Step 1: Connect the power source to the power inlet on the rear panel.

Step 2: Turn on the power switch to power up the system.

Step 3: The power LED indicator on the front panel turns to green.



Figure 3-14: Power-on



3.12 Available Drivers

All the drivers for the PUZZLE-A002 are available on IEI Resource Download Center (<https://download.ieiworld.com>). Type PUZZLE-A002 and press Enter to find all the relevant software, utilities, and documentation.

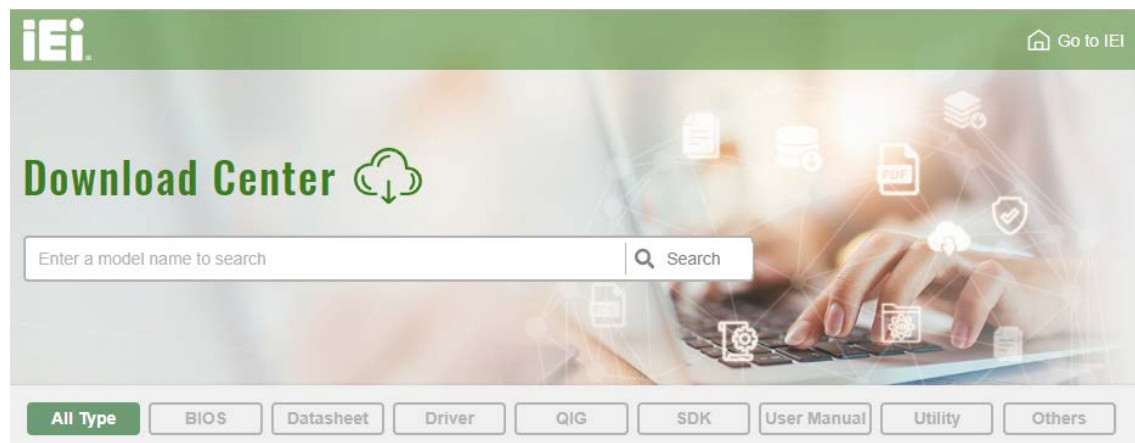


Figure 3-15: IEI Resource Download Center



NOTE:

To install software from the downloaded ISO image file in Windows 10, double-click the ISO file to mount it as a virtual drive to view its content.

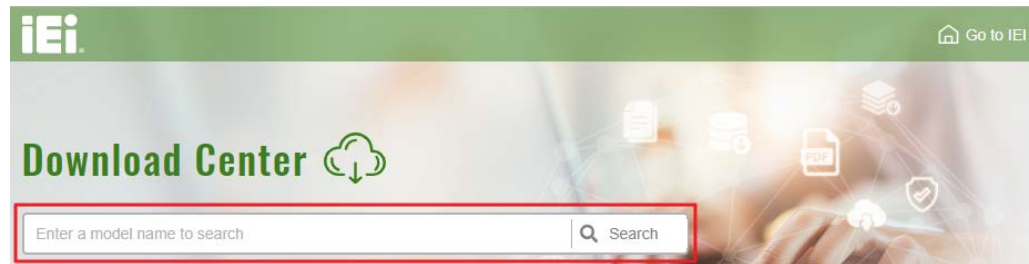


PUZZLE-A002

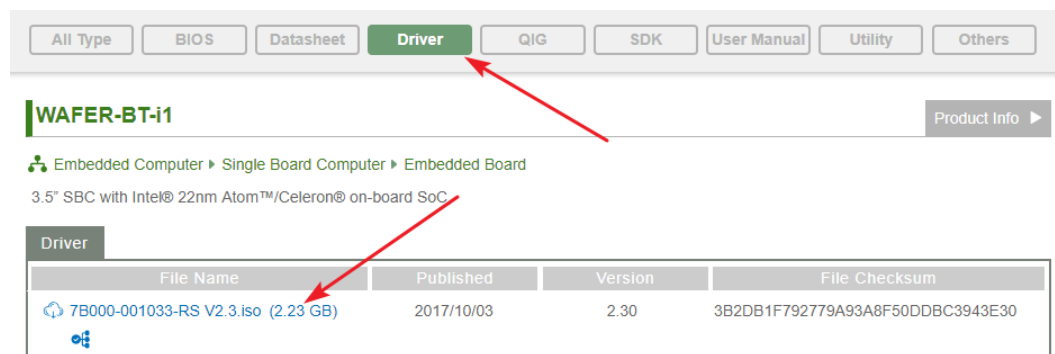
3.12.1 Driver Download

To download drivers from IEI Resource Download Center, follow the steps below.

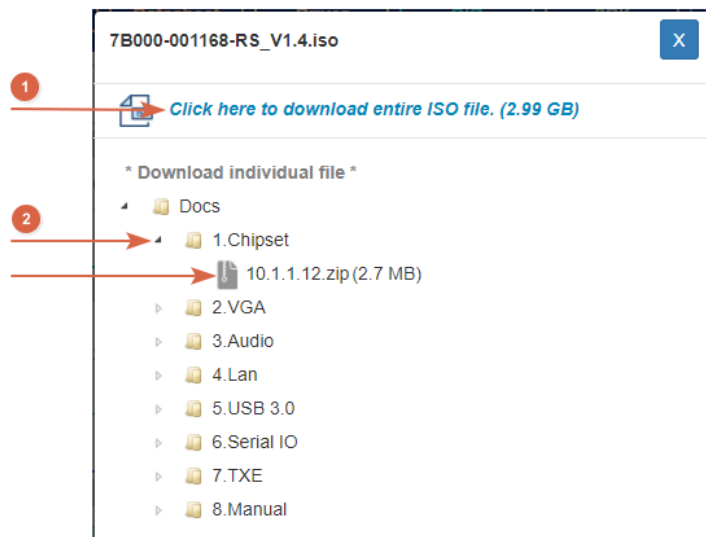
Step 1: Go to <https://download.ieiworld.com>. Type PUZZLE-A002 and press Enter.



Step 2: All product-related software, utilities, and documentation will be listed. You can choose **Driver** to filter the result.



Step 3: Click the driver file name on the page and you will be prompted with the following window. You can download the entire ISO file (❶), or click the small arrow to find an individual driver and click the file name to download (❷).



PUZZLE-A002

Chapter

4

BIOS



4.1 Introduction

The BIOS is programmed onto the BIOS chip. The BIOS setup program allows changes to certain system settings. This chapter outlines the options that can be changed.



NOTE:

Some of the BIOS options may vary throughout the life cycle of the product and are subject to change without prior notice.

4.1.1 Starting Setup

The UEFI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DEL** or **F2** key as soon as the system is turned on or
2. Press the **DEL** or **F2** key when the “**Press DEL or F2 to enter SETUP**” message appears on the screen.

If the message disappears before the **DEL** or **F2** key is pressed, restart the computer and try again.

4.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **Esc** to quit. Navigation keys are shown in **Table 4-1**.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
+	Increase the numeric value or make changes



PUZZLE-A002

Key	Function
-	Decrease the numeric value or make changes
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 key	Load previous values
F3 key	Load optimized defaults
F4 key	Save changes and exit BIOS

Table 4-1: BIOS Navigation Keys

4.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

4.1.4 Unable to Reboot after Configuration Changes

If the computer cannot boot after changes to the system configuration is made, remove the on-board RTC battery to clear CMOS, and then reinstall it.

4.1.5 BIOS Menu Bar

The **menu bar** on top of the BIOS screen has the following main items:

- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings.
- Chipset – Changes the chipset settings.
- Security – Sets User and Supervisor Passwords.
- Boot – Changes the system boot configuration.
- Save & Exit – Selects exit options and loads default settings



The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

4.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered.

The **Main** menu gives an overview of the basic system information.

Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.					
Main	Advanced	Chipset	Security	Boot	Save & Exit
BIOS Information					Set the Date. Use Tab to switch between Date elements.
BIOS Vendor			American Megatrends		
Core Version			5.12		
Compliance			UEFI 2.5; PI 1.4		
Project Version			Z540AT12.ROM		
Build Date and Time			10/01/2018 10:45:41		
iWDD Vendor			iEi		
iWDD Version			Z540ER10.bin		-----
BIOS Information					→←: Select Screen
Access Level			Administrator		↑ ↓: Select Item
System Language			[English]		Enter: Select
System Date			[Thu 11/09/2018]		+/-: Change Opt.
System Time			[06:10:27]		F1: General Help
					F2: Previous Values
					F3: Optimized Defaults
					F4: Save & Exit
					ESC: Exit
Version 2.18.1263. Copyright (C) 2018 American Megatrends, Inc.					

BIOS Menu 1: Main

The **Main** menu has two user configurable fields:

➔ System Date [xx/xx/xx]

Use the **System Date** option to set the system date. Manually enter the day, month and year.

➔ System Time [xx:xx:xx]

Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.



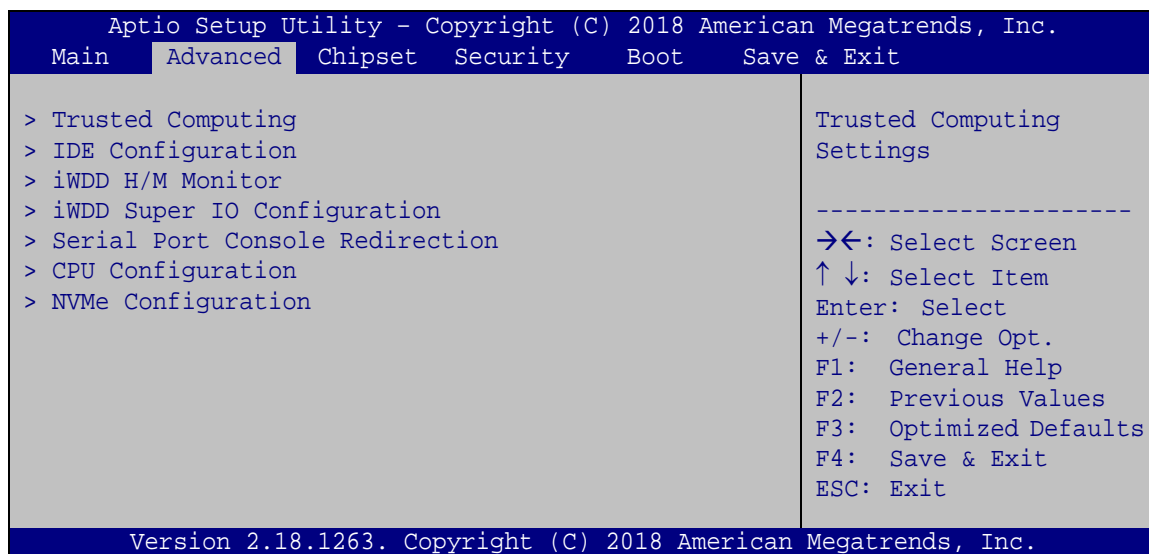
PUZZLE-A002

4.3 Advanced

Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:

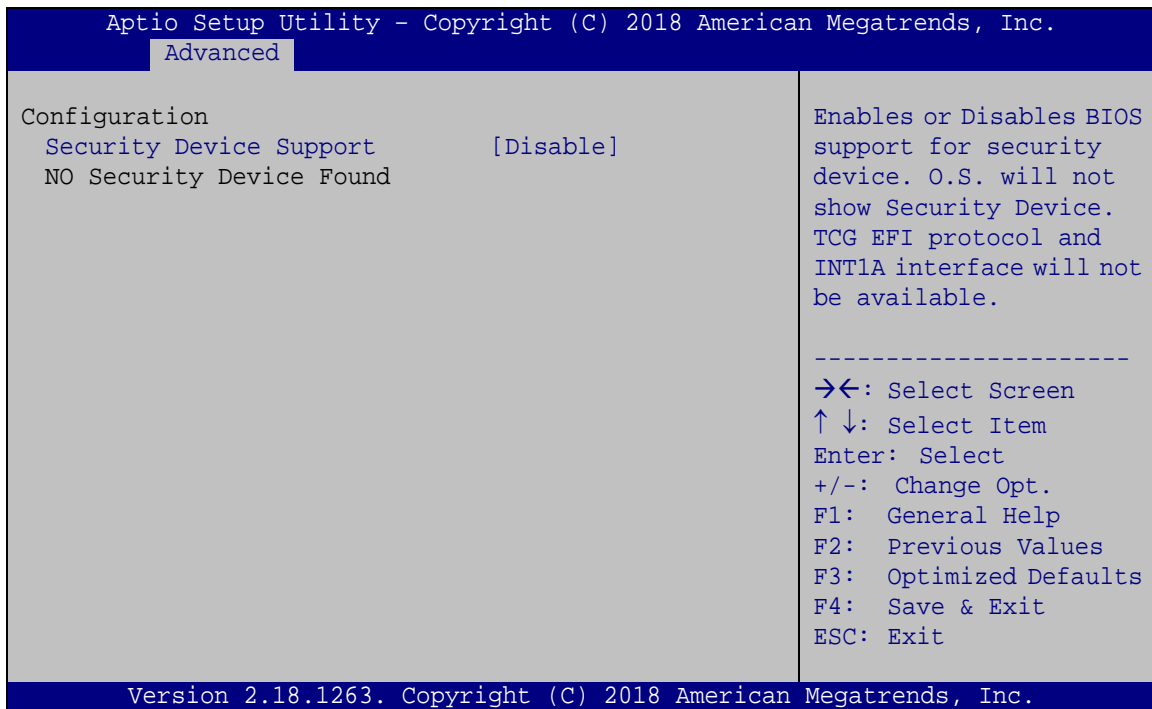
**WARNING!**

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

**BIOS Menu 2: Advanced**

4.3.1 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 3**) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).



BIOS Menu 3: Trusted Computing

➔ Security Device Support [Disable]

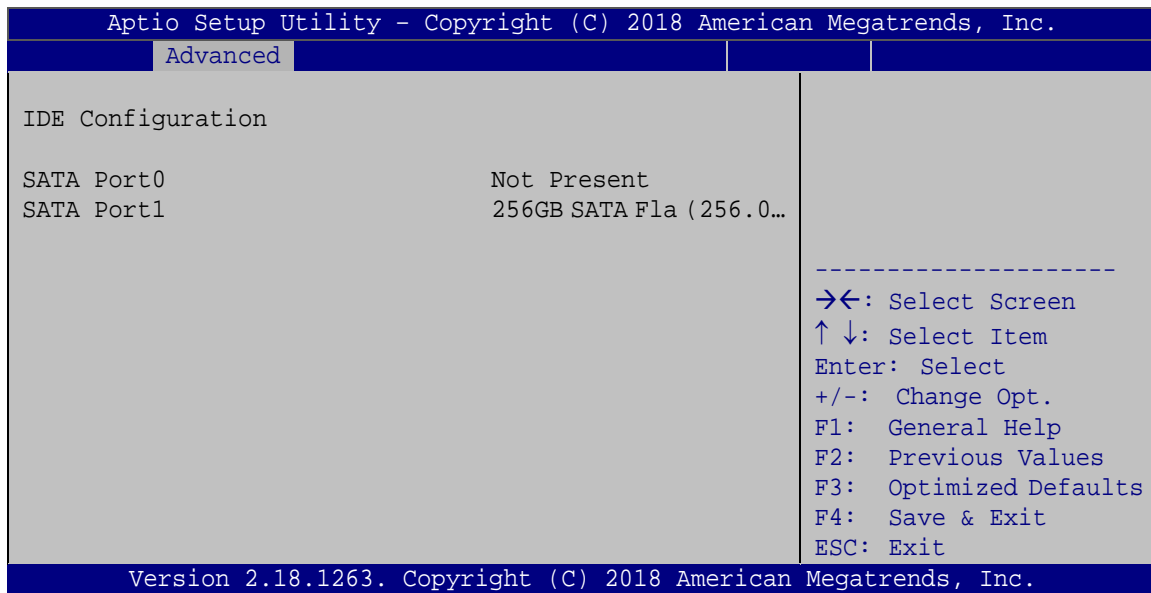
Use the **Security Device Support** option to configure support for the TPM.

- ➔ **Disable** **DEFAULT** TPM support is disabled.
- ➔ **Enable** TPM support is enabled.

PUZZLE-A002

4.3.1 IDE Configuration

Use the **IDE Configuration (BIOS Menu 4)** menu to display the configuration of the SATA devices installed in the system.



BIOS Menu 4: IDE Configuration



4.3.2 iWDD H/W Monitor

The **iWDD H/W Monitor** menu (**BIOS Menu 5**) contains the fan configuration submenu, and displays the system temperature and CPU fan speed.

Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.		
Advanced		
PC Health Status		Smart Fan Mode Select
CPU temperature	:+59 °C	
System temperature	:+32 °C	
CPU_FAN1 Speed	:4244 RPM	
CPU_FAN2 Speed	:4099 RPM	
CPU_FAN3 Speed	:4473 RPM	
SYS_FAN1 Speed	:478 RPM	
CPU_CORE	:+1.043 V	
+5V	:+5.152 V	
+DDR	:+1.199 V	
+5VSB	:+5.126 V	
+3.3V	:+3.307 V	
+3.3VSB	:+3.259 V	
> Smart Fan Mode Configuration		

		→←: 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) 2018 American Megatrends, Inc.		

BIOS Menu 5: iWDD H/W Monitor

➔ PC Health Status

The following system parameters and values are shown. The system parameters that are monitored are:

- System Temperatures:
 - CPU temperature
 - System temperature
- Fan Speeds:
 - CPU fan speed
 - System fan speed
- Voltages:
 - CPU_CORE
 - +5V

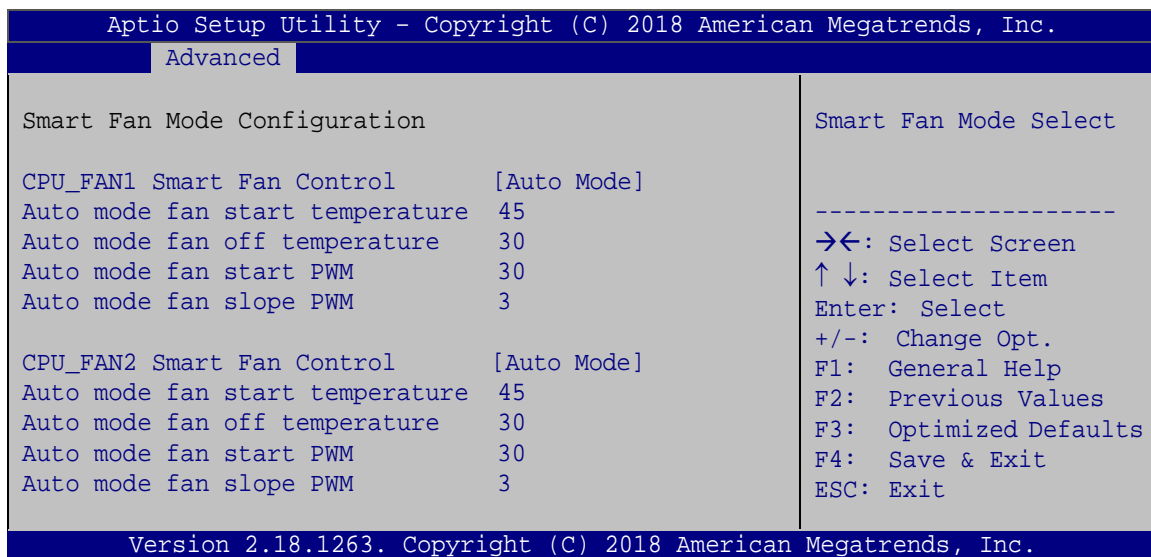


PUZZLE-A002

- DDR
- +5VSB
- +3.3V
- +3.3VSB

4.3.2.1 Smart Fan Mode Configuration

Use the **Smart Fan Mode Configuration** submenu (**BIOS Menu 6**) to configure the CPU/system fan temperature and speed settings.



BIOS Menu 6: Smart Fan Mode Configuration

→ CPU_FAN/SYS_FAN Smart Fan Control [Auto Mode]

Use the **CPU_FAN/SYS_FAN Smart Fan Control** options to configure the CPU/System Smart Fans.

- **Manual Mode** The fan spins at the speed set in Manual Mode settings.
- **Auto Mode** **DEFAULT** The fan adjusts its speed using Auto Mode settings.

The following options can only be set if the CPU Smart Fan Control option is set to Auto Mode.

➔ **Auto mode fan start temperature**

If the CPU temperature is between **fan off** and **fan start**, the fan speed change to **fan start PWM**. To set a value, Use the + or – key to change the value or enter a decimal number between 1 and 100.

➔ **Auto mode fan off temperature**

If the CPU temperature is lower than the value set this option, the fan speed change to be lowest. To set a value, Use the + or – key to change the value or enter a decimal number between 1 and 100.

➔ **Auto mode fan start PWM**

Use the **Auto mode fan start PWM** option to set the PWM start value. Use the + or – key to change the value or enter a decimal number between 1 and 100.

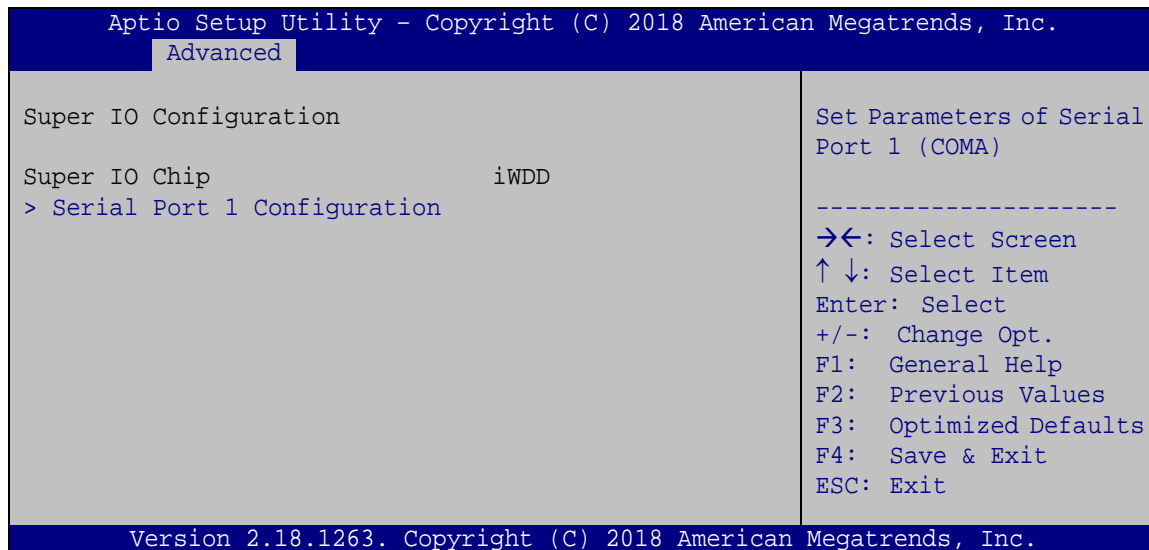
➔ **Auto mode fan slope PWM**

Use the **Auto mode fan slope PWM** option to select the linear rate at which the PWM mode increases with respect to an increase in temperature. Use the + or – key to change the value or enter a decimal number between 1 and 8.

PUZZLE-A002

4.3.3 iWDD Super IO Configuration

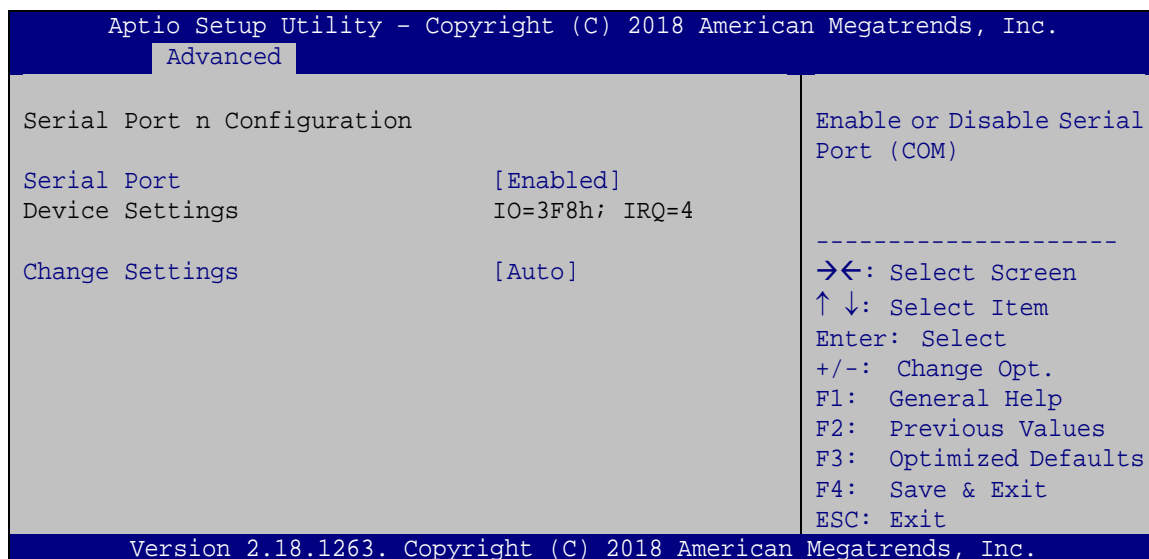
Use the **iWDD Super IO Configuration** menu (**BIOS Menu 7**) to set or change the configurations for the parallel ports and serial ports.



BIOS Menu 7: iWDD Super IO Configuration

4.3.3.1 Serial Port 1 Configuration

Use the **Serial Port 1 Configuration** menu (**BIOS Menu 8**) to configure the serial port 1.



BIOS Menu 8: Serial Port 1 Configuration Menu

→ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

- | | | |
|-------------------|----------------|-------------------------|
| → Disabled | | Disable the serial port |
| → Enabled | DEFAULT | Enable the serial port |

→ Change Settings [Auto]

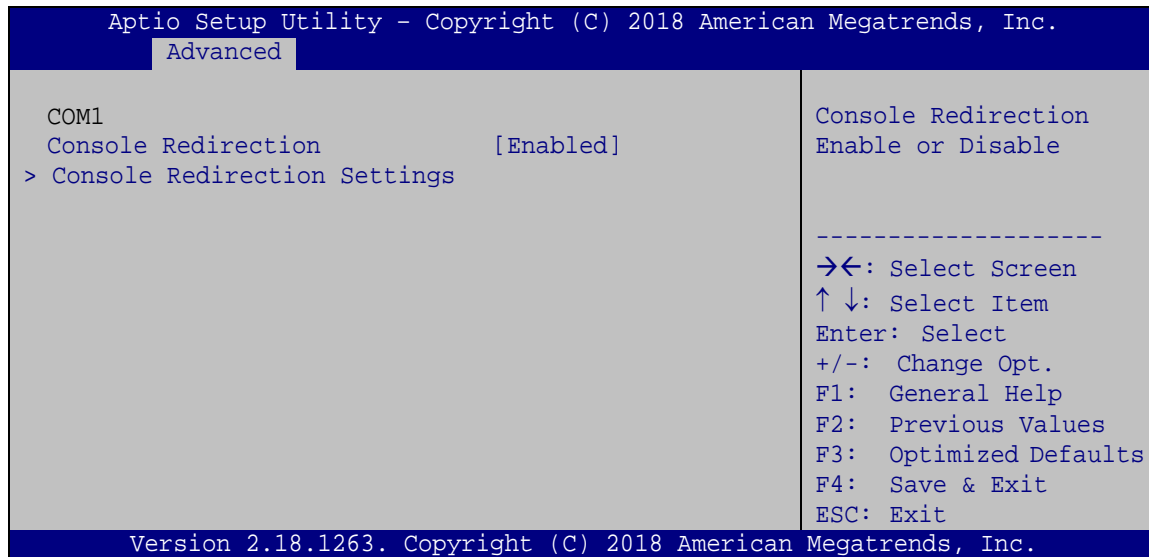
Use the **Change Settings** option to change the serial port IO port address and interrupt address.

- | | | |
|--|----------------|---|
| → Auto | DEFAULT | The serial port IO port address and interrupt address are automatically detected. |
| → IO=3F8h;
IRQ=4 | | Serial Port I/O port address is 3F8h and the interrupt address is IRQ4 |
| → IO=3F8h;
IRQ=3, 4,
5, 6, 7, 9,
10, 11, 12 | | Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12 |
| → IO=2F8h;
IRQ=3, 4,
5, 6, 7, 9,
10, 11, 12 | | Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12 |
| → IO=3E8h;
IRQ=3, 4,
5, 6, 7, 9,
10, 11, 12 | | Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12 |
| → IO=2E8h;
IRQ=3, 4,
5, 6, 7, 9,
10, 11, 12 | | Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12 |

PUZZLE-A002

4.3.4 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 9**) allows the console redirection options to be configured. Console redirection allows users to maintain a system remotely by re-directing keyboard input and text output through the serial port.

**BIOS Menu 9: Serial Port Console Redirection**➔ **Console Redirection [Enabled]**

Use **Console Redirection** option to enable or disable the console redirection function.

- ➔ **Disabled** Disabled the console redirection function
- ➔ **Enabled** **DEFAULT** Enabled the console redirection function

The following options are available in the **Console Redirection Settings** submenu when the **Console Redirection** option is enabled.

➔ **Terminal Type [ANSI]**

Use the **Terminal Type** option to specify the remote terminal type.

- ➔ **VT100** The target terminal type is VT100
- ➔ **VT100+** The target terminal type is VT100+

- ➔ **VT-UTF8** The target terminal type is VT-UTF8
- ➔ **ANSI** **DEFAULT** The target terminal type is ANSI

➔ **Bits per second [115200]**

Use the **Bits per second** option to specify the serial port transmission speed. The speed must match the other side. Long or noisy lines may require lower speeds.

- ➔ **9600** Sets the serial port transmission speed at 9600.
- ➔ **19200** Sets the serial port transmission speed at 19200.
- ➔ **57600** Sets the serial port transmission speed at 57600.
- ➔ **115200** **DEFAULT** Sets the serial port transmission speed at 115200.

➔ **Data Bits [8]**

Use the **Data Bits** option to specify the number of data bits.

- ➔ **7** Sets the data bits at 7.
- ➔ **8** **DEFAULT** Sets the data bits at 8.

➔ **Parity [None]**

Use the **Parity** option to specify the parity bit that can be sent with the data bits for detecting the transmission errors.

- ➔ **None** **DEFAULT** No parity bit is sent with the data bits.
- ➔ **Even** The parity bit is 0 if the number of ones in the data bits is even.
- ➔ **Odd** The parity bit is 0 if the number of ones in the data bits is odd.
- ➔ **Mark** The parity bit is always 1. This option does not provide error detection.
- ➔ **Space** The parity bit is always 0. This option does not provide error detection.

PUZZLE-A002**→ Stop Bits [1]**

Use the **Stop Bits** option to specify the number of stop bits used to indicate the end of a serial data packet. Communication with slow devices may require more than 1 stop bit.

- 1 DEFAULT** Sets the number of stop bits at 1.
- 2** Sets the number of stop bits at 2.

4.3.5 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 10**) to view detailed CPU specifications or enable CPU virtualization.

```

Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
  Advanced
CPU Configuration
Module Version: StoneyCPU 013
AGESA Version: StoneyPI 1.3.0.6

NX Mode                                      [Enabled]
SVM Mode                                     [Enabled]
> Node 0 Information

Enable/disable
No-execute page
protection Function

-----
→←: 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) 2018 American Megatrends, Inc.

```

BIOS Menu 10: CPU Configuration**→ NX Mode [Enabled]**

Use the **NX Mode** BIOS option to enable or disable the no-execute page protection function.

- Disabled** Disable the no-execute page protection function.
- Enabled DEFAULT** Enable the no-execute page protection function.



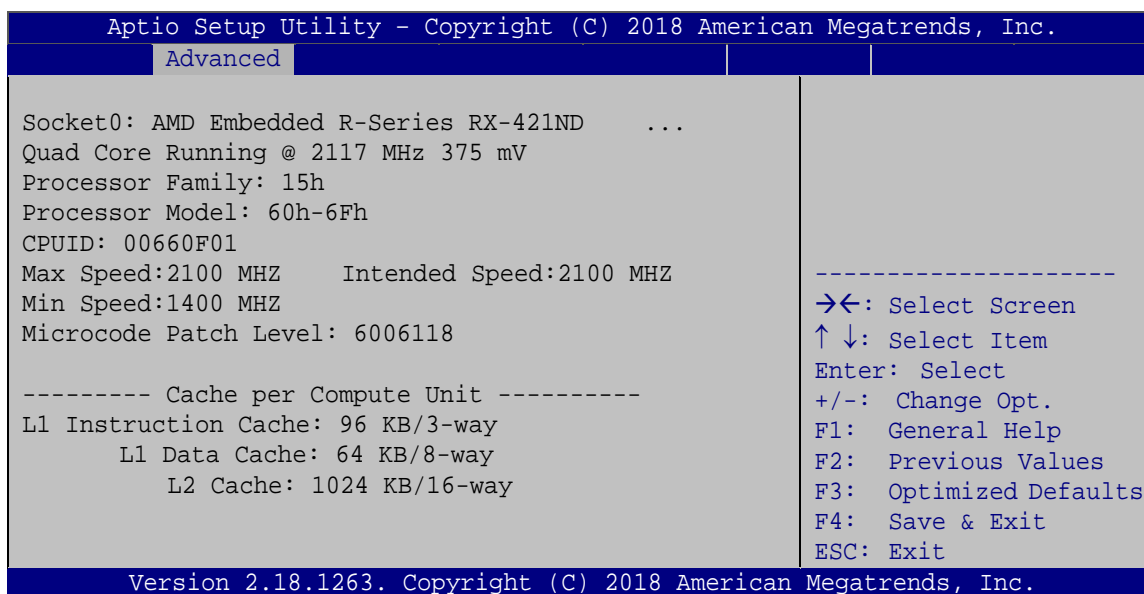
➔ SVM Mode [Enabled]

Use the **SVM Mode** option to enable or disable CPU virtualization on the system.

- ➔ Disabled Disable CPU virtualization
- ➔ Enabled **DEFAULT** Enable CPU virtualization

4.3.5.1 Node 0 Information

Use the **Node 0 Information (BIOS Menu 11)** menu to display the memory information related to Node 0.



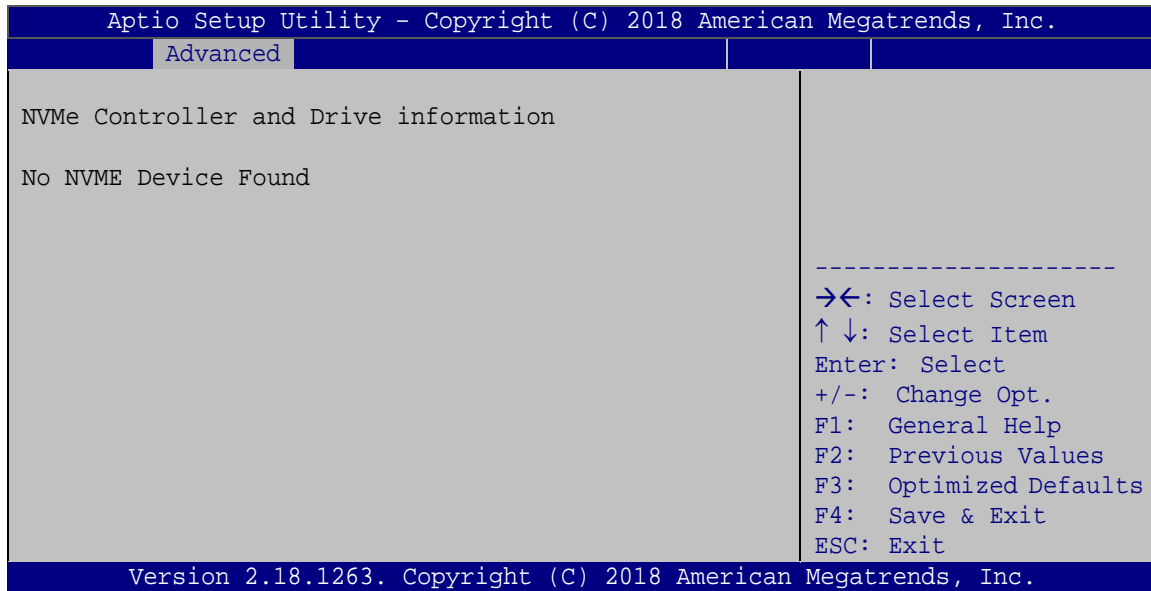
BIOS Menu 11: Node 0 Information



PUZZLE-A002

4.3.6 NVMe Configuration

Use the **NVMe Configuration (BIOS Menu 12)** menu to display the NVMe controller and device information.



BIOS Menu 12: NVMe Configuration

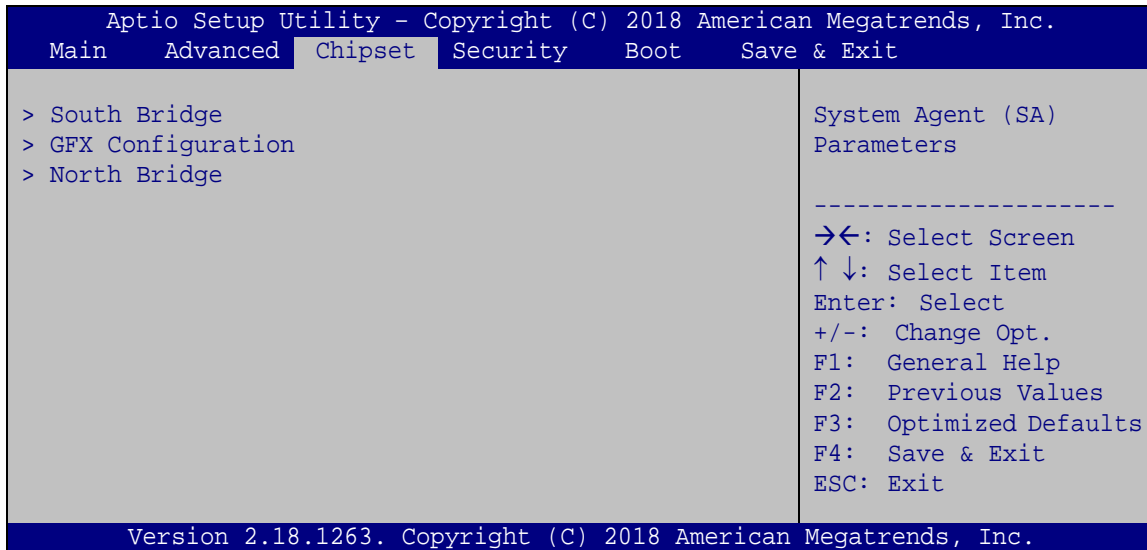
4.4 Chipset

Use the **Chipset** menu (**BIOS Menu 13**) to access the south bridge and north bridge configuration menus.



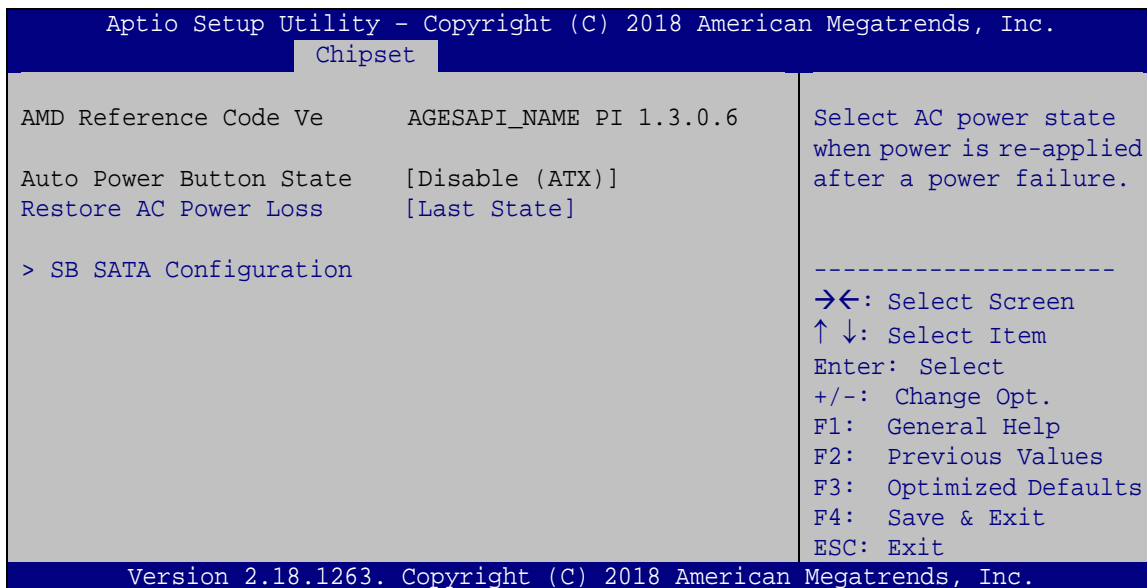
WARNING!

Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.

**BIOS Menu 13: Chipset**

4.4.1 South Bridge

Use the **South Bridge** menu (**BIOS Menu 14**) to configure the south bridge chipset.

**BIOS Menu 14: South Bridge**

➔ Restore on AC Power Loss [Last State]

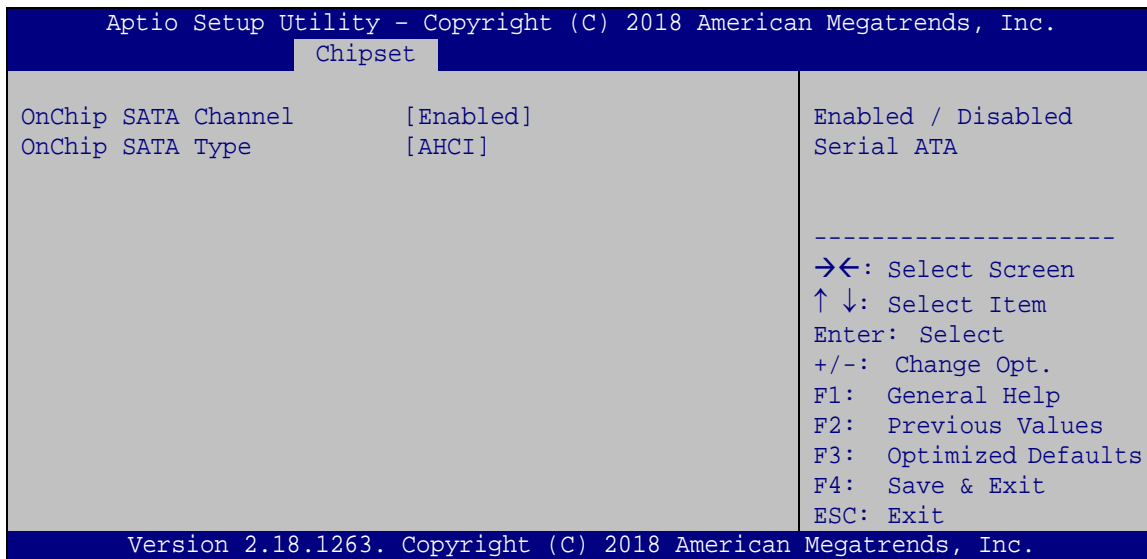
Use the **Restore on AC Power Loss** BIOS option to specify what state the system returns to if there is a sudden loss of power to the system.

PUZZLE-A002

- ➔ **Power Off** The system remains turned off
- ➔ **Power On** The system turns on
- ➔ **Last State DEFAULT** The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

4.4.1.1 SB SATA Configuration

Use the **SB SATA Configuration** submenu (**BIOS Menu 15**) to configure SATA devices.

**BIOS Menu 15: SB SATA Configuration**➔ **OnChip SATA Channel [Enabled]**

Use the **OnChip SATA Channel** option to configure the SATA channel.

- ➔ **Disabled** Disable the on-board SATA channel.
- ➔ **Enabled DEFAULT** Enable the on-board SATA channel.

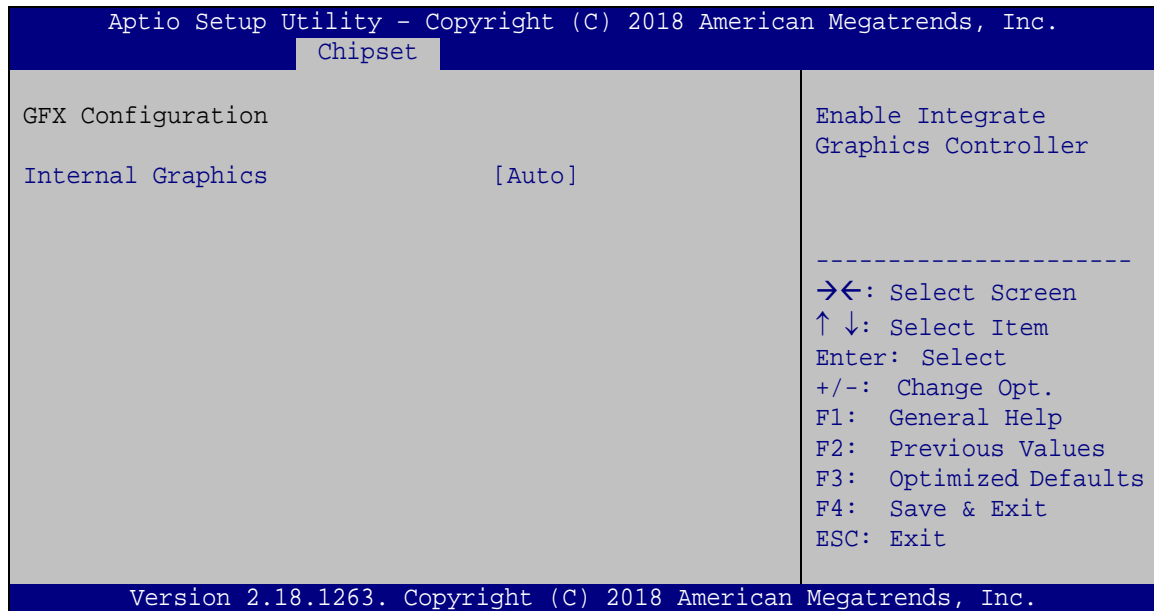
➔ **OnChip SATA Type [AHCI]**

Use the **OnChip SATA Type** option to configure the SATA device type.

- ➔ **AHCI DEFAULT** Configures SATA devices as AHCI device.
- ➔ **Legacy IDE** Configures SATA devices as IDE device.

4.4.2 GFX Configuration

Use the **GFX Configuration (BIOS Menu 16)** menu to configure the graphics controller.



BIOS Menu 16: GFX Configuration

→ Internal Graphics [Auto]

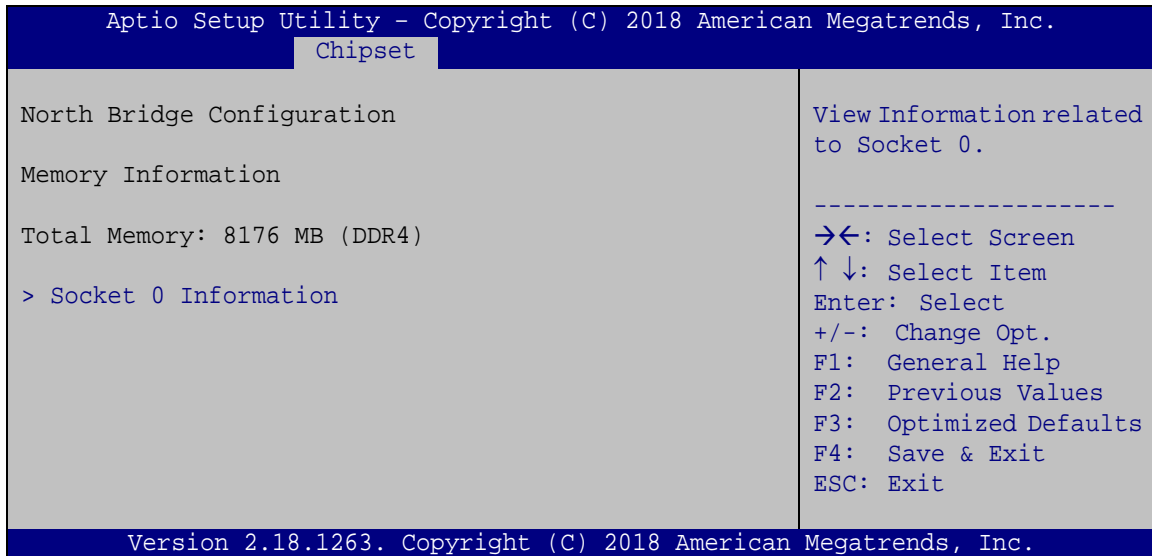
Use the **Internal Graphics** option to keep IGFX enabled basing on the setup options. The following options are available:

- Auto **Default**
- Disabled

PUZZLE-A002

4.4.3 North Bridge

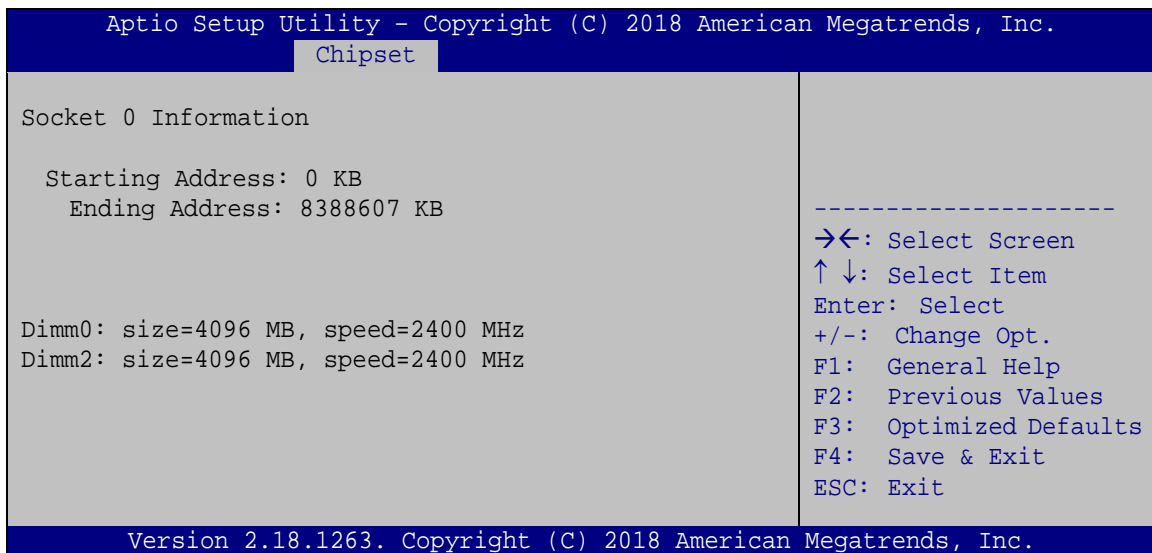
Use the **North Bridge** menu (**BIOS Menu 17**) to configure the north bridge chipset.



BIOS Menu 17: North Bridge

4.4.3.1 Socket 0 Information

Use the **Socket 0 Information** menu (**BIOS Menu 18**) to view the information related to Socket 0.



BIOS Menu 18: Socket 0 Information



4.5 Security

Use the **Security** menu (**BIOS Menu 19**) to set system and user passwords.

Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.	
Main	Advanced Chipset Security Boot Save & Exit
Password Description	Set Administrator Password
If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup.	
If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights.	-----
The password length must be:	→←: Select Screen
Minimum length 3	↑↓: Select Item
Maximum length 20	Enter: Select
Administrator Password	+/-: Change Opt.
User Password	F1: General Help
	F2: Previous Values
	F3: Optimized Defaults
	F4: Save & Exit
	ESC: Exit
Version 2.18.1263. Copyright (C) 2018 American Megatrends, Inc.	

BIOS Menu 19: Security

➔ Administrator Password

Use the **Administrator Password** to set or change a administrator password.

➔ User Password

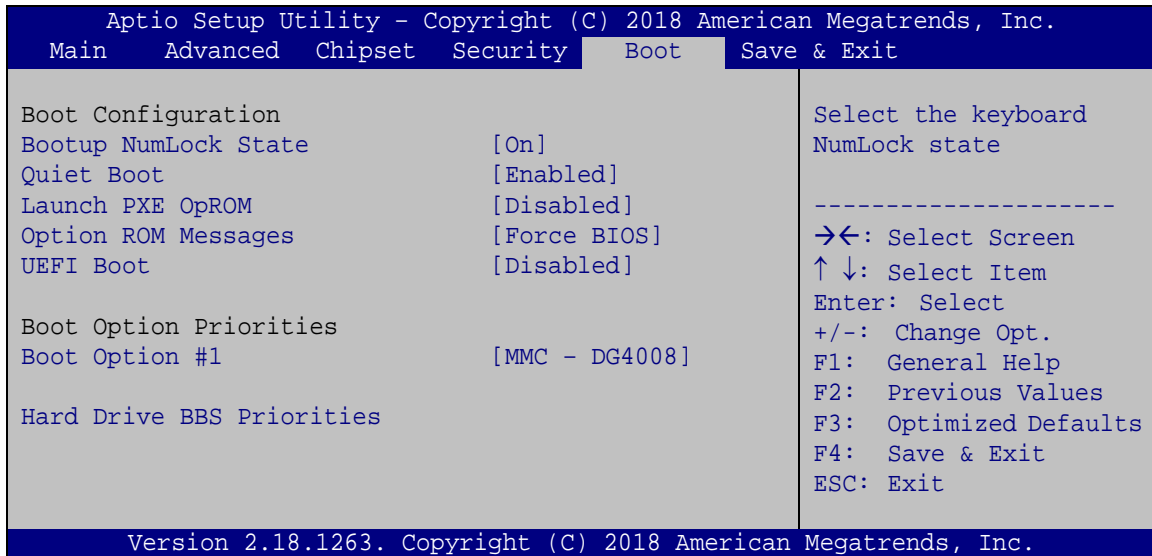
Use the **User Password** to set or change a user password.



PUZZLE-A002

4.6 Boot

Use the **Boot** menu (**BIOS Menu 20**) to configure system boot options.

**BIOS Menu 20: Boot**➔ **Bootup NumLock State [On]**

Use the **Bootup NumLock State** BIOS option to specify if the number lock setting must be modified during boot up.

➔ **On** **DEFAULT** Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

➔ **Off** Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.

→ Quiet Boot [Enabled]

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

- **Disabled** Normal POST messages displayed
- **Enabled** **DEFAULT** OEM Logo displayed instead of POST messages

→ Launch PXE OpROM [Disabled]

Use the **Launch PXE OpROM** option to enable or disable boot option for legacy network devices.

- **Disabled** **DEFAULT** Ignore all PXE Option ROMs
- **Enabled** Load PXE Option ROMs.

→ Option ROM Messages [Force BIOS]

Use the **Option ROM Messages** option to set the Option ROM display mode.

- **Force BIOS** **DEFAULT** Sets display mode to force BIOS.
- **Keep Current** Sets display mode to current.

→ UEFI Boot [Disabled]

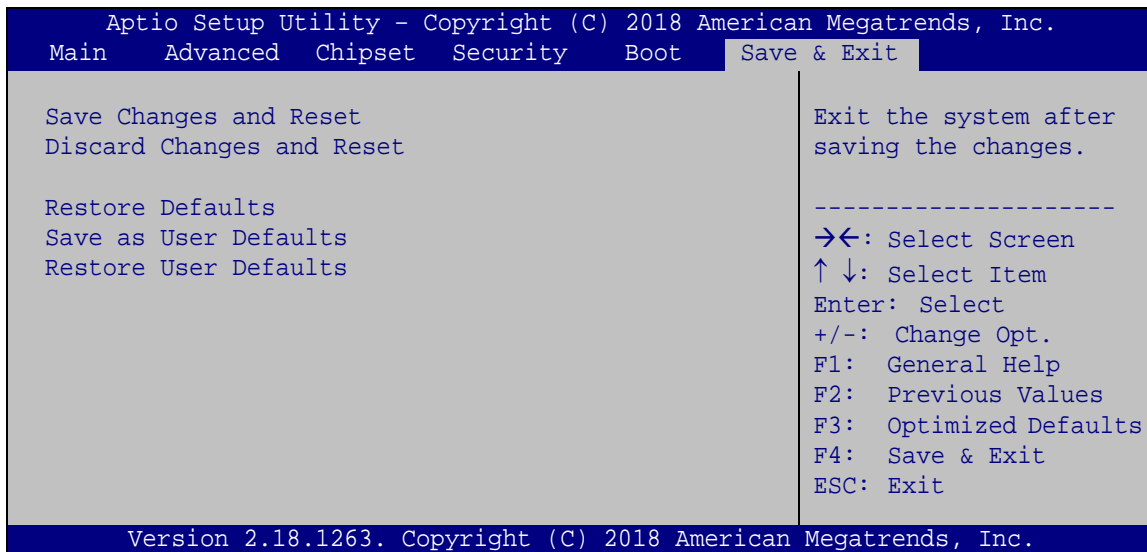
Use the **UEFI Boot** option to enable or disable to boot from the UEFI devices.

- **Disabled** **DEFAULT** Boot from UEFI devices is disabled.
- **Enabled** Boot from UEFI devices is enabled.

PUZZLE-A002

4.7 Save & Exit

Use the **Safe & Exit** menu (**BIOS Menu 21**) to load default BIOS values, optimal failsafe values and to save configuration changes.



BIOS Menu 21: Save & Exit

→ Save Changes and Reset

Use the **Save Changes and Reset** option to save the changes made to the BIOS options and reset the system.

→ Discard Changes and Reset

Use the **Discard Changes and Reset** option to exit the system without saving the changes made to the BIOS configuration setup program.

→ Restore Defaults

Use the **Restore Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F3 key can be used for this operation.**

→ Save as User Defaults

Use the **Save as User Defaults** option to save the changes done so far as user defaults.

→ Restore User Defaults

Use the **Restore User Defaults** option to restore the user defaults to all the setup options.

Chapter

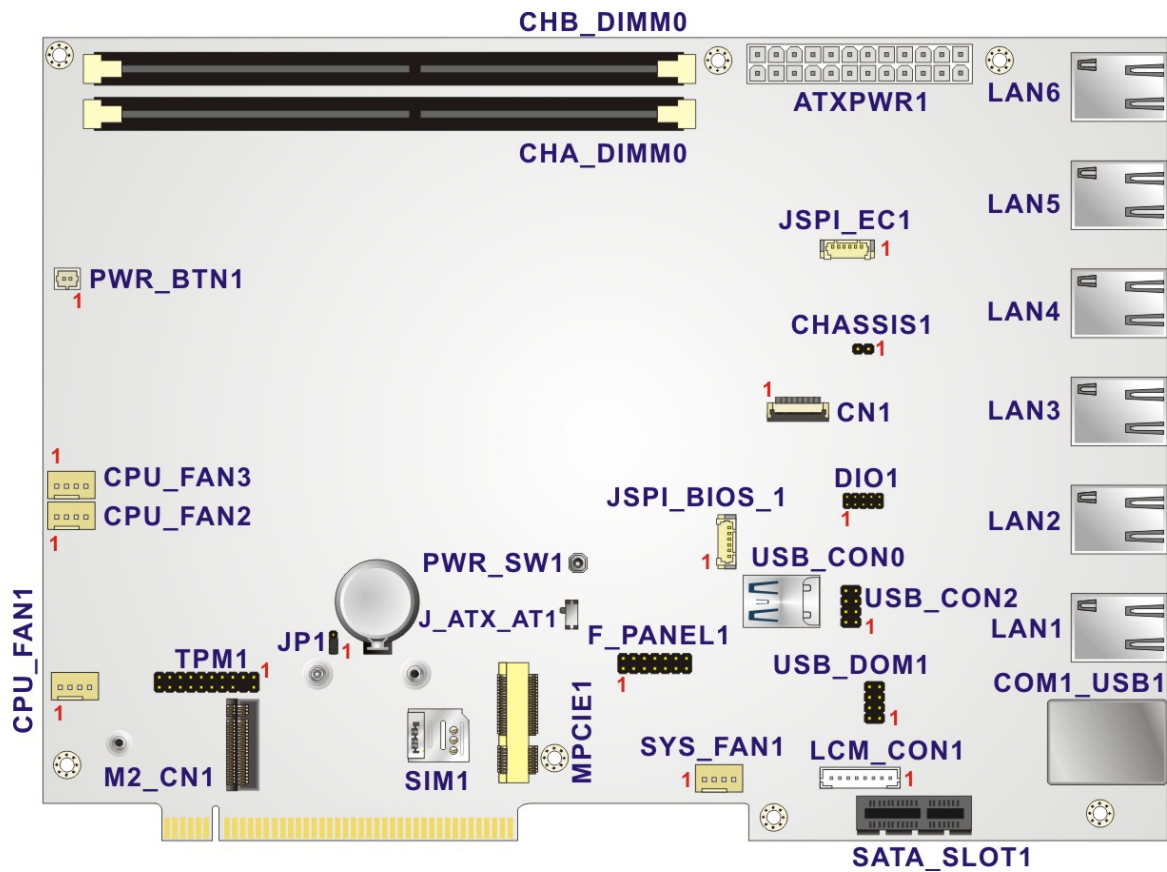
5

Interface Connectors

PUZZLE-A002

5.1 Peripheral Interface Connectors

The connector locations of the PUZZLE-A002's motherboard are shown below. The connector pinouts for these connectors are listed in the following sections.





5.2 Internal Peripheral Connectors

The table below shows a list of the connectors on the motherboard. Pinouts of these connectors can be found in the following sections.

Connector	Type	Label
ATX power connector	24-pin connector	ATXPWR1
Chassis intrusion connector	2-pin header	CHASSIS1
Digital I/O connector	10-pin header	DIO1
EC debug connector	20-pin FPC	CN1
Fan connectors	4-pin wafer	CPU_FAN1, CPU_FAN2, CPU_FAN3, SYS_FAN1
Front panel connector	14-pin header	F_PANEL1
LCM connector	8-pin wafer	LCM_CON1
M.2 slot	M.2 A-key slot	M2_CN1
Memory slots	DDR4 DIMM slot	CHA_DIMM0, CHB_DIMM0
PCIe Mini slot (full-/half-size)	PCIe Mini slot	MPCIE1
Power switch connector	2-pin wafer	PWR_BTN1
Power button (on-board)	Push button	PWR_SW1
SATA 6Gb/s socket	36-pin socket	SATA0_1
SIM card slot	SIM card slot	SIM1
SPI flash connector	6-pin wafer	JSPI_BIOS_1
SPI flash connector (EC)	6-pin wafer	JSPI_EC1
TPM connector	20-pin header	TPM1
USB 2.0 connector	8-pin header	USB_CON2
USB 3.1 Gen 1 connectors	USB Type-A	USB_CON0
USB DOM connector	8-pin header	USB_DOM1

Table 5-1: Peripheral Interface Connectors



PUZZLE-A002**5.2.1 ATX Power Connector (ATXPWR1)**

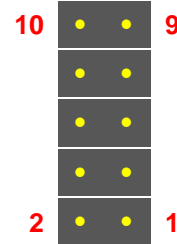
Pin	Description	Pin	Description
1	+3.3 V	13	+3.3 V
2	+3.3 V	14	N/C
3	GND	15	GND
4	+5 V	16	PS-ON
5	GND	17	GND
6	+5 V	18	GND
7	GND	19	GND
8	PW-OK	20	N/C
9	+5VSB	21	+5 V
10	+12V	22	+5 V
11	+12V	23	+5 V
12	+3.3 V	24	GND

Table 5-2: ATX Power Connector (ATXPWR1) Pinouts**5.2.2 Chassis Intrusion Connector (CHASSIS1)**

PIN NO.	DESCRIPTION
1	+3.3VSB
2	CHASSIS OPEN

Table 5-3: Chassis Intrusion Connector (CHASSIS1) Pinouts**5.2.3 DIO Connector (DIO1)**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

**Table 5-4: DIO Connector (DIO1) Pinouts**



5.2.4 EC Debug Connector (CN1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	KSI0	2	KSO0
3	KSO1	4	KSO2
5	KSO3	6	KSO4
7	KSO5	8	KSO6
9	KSO7	10	KSO8
11	KSO9	12	KSO10
13	KSO12	14	KSI1
15	KSO11	16	KSI2
17	KSI3	18	GND
19	GND	20	GND

Table 5-5: EC Debug Connector (CN1) Pinouts

5.2.5 Fan Connectors (CPU_FAN1/2/3, SYS_FAN1)

PIN NO.	DESCRIPTION
1	GND
2	+12V
3	FANIO
4	PWM

Table 5-6: Fan Connectors (CPU_FAN1/2/3, SYS_FAN1) Pinouts



PUZZLE-A002

5.2.6 Front Panel Connector (F_PANEL1)

FUNCTION	PIN	DESCRIPTION	FUNCTION	PIN	DESCRIPTION
Power LED	1	PWR_LED+	Speaker	2	Speaker+
	3	N/C		4	N/C
	5	PWR_LED-		6	N/C
Power Button	7	PWR_BTN+	Reset	8	Speaker-
	9	PWR_BTN-		10	N/C
HDD LED	11	HDD_LED+		12	Reset+
	13	HDD_LED-		14	Reset-




Table 5-7: Front Panel Connector (F_PANEL1) Pinouts

5.2.7 LCM Connector (LCM_CON1)

PIN NO.	DESCRIPTION
1	VCC5V
2	Power button
3	LCM RX
4	LCM TX
5	HDD LED
6	Alert LED
7	Reset button
8	GND

Table 5-8: LCM Connector (LCM_CON1) Pinouts



5.2.1 M.2 Slot (M2_CN1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+3.3V
3	USB_D+	4	+3.3V
5	USB_D-	6	N/C
7	GND	8	N/C
9	N/C	10	N/C
11	N/C	12	N/C
13	N/C	14	N/C
15	N/C	16	N/C
17	N/C	18	GND
19	N/C	20	N/C
21	N/C	22	N/C
23	N/C	24	N/C
25	N/C	26	N/C
27	N/C	28	N/C
29	N/C	30	N/C
31	N/C	32	N/C
33	GND	34	N/C
35	PCIe_TX+	36	N/C
37	PCIe_TX-	38	N/C
39	GND	40	N/C
41	PCIe_RX+	42	N/C
43	PCIe_RX-	44	N/C
45	GND	46	N/C
47	REFCLK+	48	N/C
49	REFCLK-	50	PCH_SUSCLK
51	GND	52	RST
53	CLKREQ	54	BT_RF_KILL-
55	PCH_WAKE-	56	WIFI_RF_KILL-
57	GND	58	I2C_DATA
59	N/C	60	I2C_CLK



PUZZLE-A002

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
61	N/C	62	INT-
63	GND	64	N/C
65	N/C	66	RESET-
67	N/C	68	CLKREQ
69	GND	70	PEWAKE-
71	N/C	72	+3.3V
73	N/C	74	+3.3V
75	GND		

Table 5-9: M.2 Slot (M2_CN1) Pinouts**5.2.2 PCIe Mini Card Slot (MPCIE1)**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PCH_WAKE-	2	+3.3V
3	N/C	4	GND
5	N/C	6	1.5V
7	+3.3V_DUAL	8	SIM_VCC
9	GND	10	SIM_IO
11	REF_CLK-	12	SIM_CLK
13	REF_CLK+	14	SIM_RST
15	GND	16	SIM_VPP
17	N/C	18	GND
19	N/C	20	+3.3V
21	GND	22	PLTRST_N
23	PCIe_RX-	24	+3.3V
25	PCIe_RX+	26	GND
27	GND	28	1.5V
29	GND	30	SMB_CLK
31	PCIe_TX-	32	SMB_DATA
33	PCIe_TX+	34	GND
35	GND	36	USB_DATA-



PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
37	GND	38	USB_DATA+
39	+3.3V	40	GND
41	+3.3V	42	N/C
43	GND	44	N/C
45	N/C	46	N/C
47	N/C	48	1.5V
49	N/C	50	GND
51	mSATA_DET	52	+3.3V

Table 5-10: PCIe Mini Card Slot (MPCIE1) Pinouts

5.2.1 Power Switch Connector (PWR_BTN1)

PIN NO.	DESCRIPTION
1	PWRBTN_SW+
2	PWRBTN_SW-

Table 5-11: Power Switch Connector (PWR_BTN1) Pinouts

5.2.2 SATA Connector (SATA0_1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
B1	+V12S	A1	N/C
B2	+V12S	A2	+V12S
B3	+V12S	A3	+V12S
B4	GND	A4	GND
B5	SATA_TX1-	A5	+V5S
B6	SATA_TX1+	A6	+V5S
B7	GND	A7	SATA_RX1-
B8	+V3.3S	A8	SATA RX1+
B9	+V5S	A9	+V3.3S
B10	N/C	A10	+V3.3S
B11	+V5S	A11	+V5S



PUZZLE-A002

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
B12	+V5S	A12	GND
B13	GND	A13	N/C
B14	SATA_TX0-	A14	N/C
B15	SATA_TX0+	A15	GND
B16	GND	A16	SATA_RX0-
B17	+V5S	A17	SATA RX0+
B18	GND	A18	GND

Table 5-12: SATA 6Gb/s Connector (SATA0_1) Pinouts**5.2.3 SPI Flash Connector (JSPI_BIOS_1)**

PIN NO.	DESCRIPTION
1	+1.8V
2	SPI_CS
3	SPI_SO
4	SPI_CLK
5	SPI_SI
6	GND

Table 5-13: SPI Flash Connector (JSPI_BIOS_1) Pinouts**5.2.4 SPI Flash Connector - EC (JSPI_EC1)**

PIN NO.	DESCRIPTION
1	+V3.3
2	SPI_CS#0_CN_EC
3	SPI_SO_SW_EC
4	SPI_CLK_SW_EC
5	SPI_SI_SW_EC
6	GND

Table 5-14: SPI Flash Connector - EC (JSPI_EC1) Pinouts



5.2.5 TPM Connector (TPM1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LCLK	2	GND
3	LFRAME#	4	KEY
5	LRERST#	6	+5V
7	LAD3	8	LAD2
9	+3.3V	10	LAD1
11	LAD0	12	GND
13	SCL	14	SDA
15	SB3V	16	SERIRQ
17	GND	18	GLKRUN#
19	LPCPD#	20	LDRO#

Table 5-15: TPM Connector (TPM1) Pinouts

5.2.6 USB 2.0 Connector (USB_CON2)

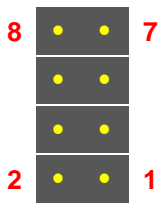
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION	
1	VCC	2	GND	
3	USB_DATA-	4	USB_DATA+	
5	USB_DATA+	6	USB_DATA-	
7	GND	8	VCC	

Table 5-16: USB 2.0 Connector (USB_CON2) Pinouts

5.2.7 USB DOM Connector (USB_DOM1)

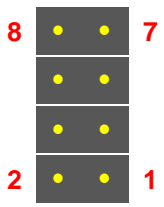
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION	
1	VCC5V	2	N/A	
3	USB-	4	N/A	
5	USB+	6	N/A	
7	GND	8	N/A	

Table 5-17: USB DOM Connector (USB_DOM1) Pinouts



Appendix

A

Regulatory Compliance

DECLARATION OF CONFORMITY

This equipment is in conformity with the following EU directives:

- EMC Directive 2014/30/EU
- Low-Voltage Directive 2014/35/EU
- RoHS II Directive 2011/65/EU

If the user modifies and/or install other devices in the equipment, the CE conformity declaration may no longer apply.

If this equipment has telecommunications functionality, it also complies with the requirements of the R&TTE Directive 1999/5/EC.

English

IEI Integration Corp declares that this equipment is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

Български [Bulgarian]

IEI Integration Corp. декларира, че този оборудване е в съответствие със съществените изисквания и другите приложими правила на Директива 1999/5/EC.

Česky [Czech]

IEI Integration Corp tímto prohlašuje, že tento zařazení je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.

Dansk [Danish]

IEI Integration Corp erklærer herved, at følgende udstyr overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.

Deutsch [German]

IEI Integration Corp, erklärt dieses Gerät entspricht den grundlegenden Anforderungen und den weiteren entsprechenden Vorgaben der Richtlinie 1999/5/EU.

Eesti [Estonian]

IEI Integration Corp deklareerib seadme seadme vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.

PUZZLE-A002

Español [Spanish]

IEI Integration Corp declara que el equipo cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.

Ελληνική [Greek]

IEI Integration Corp ΔΗΛΩΝΕΙ ΟΤΙ ΕΞΟΠΛΙΣΜΟΣ ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/EK.

Français [French]

IEI Integration Corp déclare que l'appareil est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.

Italiano [Italian]

IEI Integration Corp dichiara che questo apparecchio è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.

Latviski [Latvian]

IEI Integration Corp deklarē, ka iekārta atbilst būtiskajām prasībām un citiem ar to saistītajiem noteikumiem Direktīvas 1999/5/EK.

Lietuvių [Lithuanian]

IEI Integration Corp deklaruoja, kad šis įranga atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.

Nederlands [Dutch]

IEI Integration Corp dat het toestel toestel in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.

Malti [Maltese]

IEI Integration Corp jiddikjara li dan prodott jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Direttiva 1999/5/EC.

Magyar [Hungarian]

IEI Integration Corp nyilatkozik, hogy a berendezés megfelel a vonatkozó alapvető követelményeknek és az 1999/5/EC irányelv egyéb előírásainak.

Polski [Polish]

IEI Integration Corp oświadcza, że wyrobu jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC.

Português [Portuguese]

IEI Integration Corp declara que este equipamento está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.

Româna [Romanian]

IEI Integration Corp declară că acest echipament este în conformitate cu cerințele esențiale și cu celelalte prevederi relevante ale Directivei 1999/5/CE.

Slovensko [Slovenian]

IEI Integration Corp izjavlja, da je ta opreme v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.

Slovensky [Slovak]

IEI Integration Corp týmto vyhlasuje, že zariadenia spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.

Suomi [Finnish]

IEI Integration Corp vakuuttaa täten että laitteet on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.

Svenska [Swedish]

IEI Integration Corp förklarar att denna utrustningstyp står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.

PUZZLE-A002**FCC WARNING**

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

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the 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 instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

ROHS STATEMENT

The label on the product indicates this product conforms to European (EU) Restriction of Hazardous Substances (RoHS) that set maximum concentration limits on hazardous materials used in electrical and electronic equipment.

CHINA ROHS

The label on the product indicates the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Appendix

B

Safety Precautions

PUZZLE-A002

B.1 Safety Precautions

**WARNING:**

The precautions outlined in this appendix should be strictly followed. Failure to follow these precautions may result in permanent damage to the PUZZLE-A002.

Please follow the safety precautions outlined in the sections that follow:

B.1.1 General Safety Precautions

Please ensure the following safety precautions are adhered to at all times.

- ***Make sure the power is turned off and the power cord is disconnected*** when moving, installing or modifying the system.
- ***Do not apply voltage levels that exceed the specified voltage range.*** Doing so may cause fire and/or an electrical shock.
- ***Electric shocks can occur*** if opened while still powered on.
- ***Do not drop or insert any objects*** into the ventilation openings.
- ***If considerable amounts of dust, water, or fluids enter the system***, turn off the power supply immediately, unplug the power cord, and contact the system vendor.
- **DO NOT:**
 - Drop the system against a hard surface.
 - In a site where the ambient temperature exceeds the rated temperature

B.1.2 Anti-static Precautions

**WARNING:**

Failure to take ESD precautions during the installation of the PUZZLE-A002 may result in permanent damage to the PUZZLE-A002 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the PUZZLE-A002. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the PUZZLE-A002 is opened and any of the electrical components are handled, the following anti-static precautions are strictly adhered to.

- **Wear an anti-static wristband:** Wearing a simple anti-static wristband can help to prevent ESD from damaging any electrical component.
- **Self-grounding:** Before handling any electrical component, touch any grounded conducting material. During the time the electrical component is handled, frequently touch any conducting materials that are connected to the ground.
- **Use an anti-static pad:** When configuring or working with an electrical component, place it on an anti-static pad. This reduces the possibility of ESD damage.
- **Only handle the edges of the electrical component:** When handling the electrical component, hold the electrical component by its edges.

B.1.3 Product Disposal

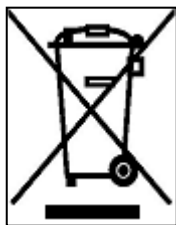


CAUTION:

Risk of explosion if the battery is replaced by an incorrect type;

Dispose of used batteries according to instructions and local regulations.

- Outside the European Union - If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.
- Within the European Union:



EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes monitors and electrical accessories, such as signal cables or power cords. When you need to dispose of your display products, please follow

PUZZLE-A002

the guidance of your local authority, or ask the shop where you purchased the product. The mark on electrical and electronic products only applies to the current European Union Member States.

Please follow the national guidelines for electrical and electronic product disposal.

B.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the PUZZLE-A002, please follow the guidelines below.

B.2.1 Maintenance and Cleaning

Prior to cleaning any part or component of the PUZZLE-A002, please read the details below.

- The interior of the PUZZLE-A002 does not require cleaning. Keep fluids away from the PUZZLE-A002 interior.
- Be cautious of all small removable components when vacuuming the PUZZLE-A002.
- Turn the PUZZLE-A002 off before cleaning the PUZZLE-A002.
- Never drop any objects or liquids through the openings of the PUZZLE-A002.
- Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning the PUZZLE-A002.
- Avoid eating, drinking and smoking within vicinity of the PUZZLE-A002.

B.2.2 Cleaning Tools

Some components in the PUZZLE-A002 may only be cleaned using a product specifically designed for the purpose. In such case, the product will be explicitly mentioned in the cleaning tips. Below is a list of items to use when cleaning the PUZZLE-A002.

- **Cloth** – Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the PUZZLE-A002.
- **Water or rubbing alcohol** – A cloth moistened with water or rubbing alcohol can be used to clean the PUZZLE-A002.
- **Using solvents** – The use of solvents is not recommended when cleaning the PUZZLE-A002 as they may damage the plastic parts.

- ***Vacuum cleaner*** – Using a vacuum specifically designed for computers is one of the best methods of cleaning the PUZZLE-A002. Dust and dirt can restrict the airflow in the PUZZLE-A002 and cause its circuitry to corrode.
- ***Swabs*** - Swabs moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas. Whenever possible, it is best to use lint free swabs such as foam swabs for cleaning.

Appendix

C

Hazardous Materials Disclosure



The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the following table.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	O	O	O	O	O	O
Display	O	O	O	O	O	O
Printed Circuit Board	O	O	O	O	O	O
Metal Fasteners	O	O	O	O	O	O
Cable Assembly	O	O	O	O	O	O
Fan Assembly	O	O	O	O	O	O
Power Supply Assemblies	O	O	O	O	O	O
Battery	O	O	O	O	O	O
O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006 (now replaced by GB/T 26572-2011).						
X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006 (now replaced by GB/T 26572-2011).						



PUZZLE-A002

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有“环境友好使用期限”的标签，此期限是估算这些物质“不会有泄漏或突变”的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯 醚 (PBDE)
壳体	O	O	O	O	O	O
显示	O	O	O	O	O	O
印刷电路板	O	O	O	O	O	O
金属螺帽	O	O	O	O	O	O
电缆组装	O	O	O	O	O	O
风扇组装	O	O	O	O	O	O
电力供应组装	O	O	O	O	O	O
电池	O	O	O	O	O	O
<p>O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T 11363-2006 (现由 GB/T 26572-2011 取代) 标准规定的限量要求以下。</p> <p>X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 (现由 GB/T 26572-2011 取代) 标准规定的限量要求。</p>						