# BC680R

12th/13th Gen Intel® Core™ Processors ATX Motherboard with Intel® R680E Chipset

# **User's Manual**

1<sup>st</sup> Ed –12 January 2024

#### **FCC Statement**

THIS DEVICE COMPLIES WITH PART 15 FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS:

(1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE.

(2) 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.

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#### Notice

This guide is designed for experienced users to setup the system within the shortest time. For detailed information, please always refer to the electronic user's manual.

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- 5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

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# 1. Getting Started

# **1.1 Safety Precautions**

#### Warning!



Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.

#### **Caution!**



Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

# **1.2 Packing List**

Before you begin installing your single board, please make sure that the following materials have been shipped:

- 1 x BC680R Motherboard
- 1 x I/O Shield



If any of the above items is damaged or missing, contact your retailer.

# 1.3 Document Amendment History

| Revision        | Date          | Ву     | Comment         |
|-----------------|---------------|--------|-----------------|
| 1 <sup>st</sup> | November 2023 | Avalue | Initial Release |

# **1.4 Manual Objectives**

This manual describes in details Avalue Technology BC680R Single Board.

We have tried to include as much information as possible but we have not duplicated information that is provided in the standard IBM Technical References, unless it proved to be necessary to aid in the understanding of this board.

We strongly recommend that you study this manual carefully before attempting to set up BC680R or change the standard configurations. Whilst all the necessary information is available in this manual we would recommend that unless you are confident, you contact your supplier for guidance.

Please be aware that it is possible to create configurations within the CMOS RAM that make booting impossible. If this should happen, clear the CMOS settings, (see the description of the Jumper Settings for details).

If you have any suggestions or find any errors regarding this manual and want to inform us of these, please contact our Customer Service department with the relevant details.

# 1.5 System Specifications

| System  |  |  |  |  |  |
|---|--|--|--|--|--|
| CPU Intel® 12/13th Gen Core™ i9/i7/i5/i3 Processor, supports LGA 1700 CPU Up to |  |  |  |  |  |
| CFU   | 65W Max  |  |  |  |  |
| BIOS AMI uEFI BIOS, 256Mbit SPI Flash ROM                                       |  |  |  |  |  |
| System Chipset  | Intel® R680E chipsets  |  |  |  |  |
| I/O Chip  | I/O Chip Nuvoton NCT6126D (eSPI super IO)  |  |  |  |  |
| System Momory   | 4 x DIMM Up to 128GB Max Dual Channel DDR5 4400 MHz with ECC Support             |  |  |  |  |
| System Memory   | (Optional ECC Support depending on selected CPU)                                 |  |  |  |  |
| Watchdog Timer  | H/W Reset, 5~255 seconds/5~255 minutes   |  |  |  |  |
| H/W/ Statue   | CPU temperature monitoring   |  |  |  |  |
| Monitor   | Voltages monitoring  |  |  |  |  |
| WOIIItoi  | CPU fan speed control  |  |  |  |  |
| RAID  | Support RAID 0, 1, 5, 10   |  |  |  |  |
| ТРМ   | <b>TPM</b> TPM 2.0   |  |  |  |  |
| iAMT  | Intel® AMT 16  |  |  |  |  |
| Other 1 x Thunderbolt Header(optional)  |  |  |  |  |  |
| Expansion Slot  |  |  |  |  |  |
| M.2   | 1 x M.2 2230 E Key with CNVi Support (PCIe x1 + USB 2.0)                         |  |  |  |  |
|   | 1 x Gen 5 PCIe x16 (x16 Physical Black) (Slot 2)                                 |  |  |  |  |
|   | 2 x Gen 4 PCIe x4 (x16 Physical Orange) (Slot 4 & 7)                             |  |  |  |  |
| PCIo  | 1 x Gen 3 PCIe x4 (x16 Physical Brown) (Slot 3)                                  |  |  |  |  |
| FCIE  | 1 x Gen 3 PCIe x4 (x16 Physical Yellow) (Slot 3) 1 x Gen 3 PCIe x1 (x16 Physical |  |  |  |  |
|   | Yellow) (Slot 6)   |  |  |  |  |
|   | 2 x Gen 3 PCIe x1 Open Ended (Slot 1 & 5)  |  |  |  |  |
|   | Storage  |  |  |  |  |
| M 2   | 1 x M.2 2242/2280/22110 M Key NVMe (PCIe x4 + SATA III)                          |  |  |  |  |
|   | 1 x M.2 2242/2280/22110 M Key NVMe (PCIe x4 Only)                                |  |  |  |  |
| SATA  | 4 x SATA III   |  |  |  |  |
| Edge I/O  |  |  |  |  |  |
| LAN   | 2 x 2.5 Gigabit Ethernet   |  |  |  |  |
| USB 3 2   | 6 x USB 3.2 Gen 2x1 Type-A Connectors  |  |  |  |  |
|   | 1 x USB 3.2 Gen 2x2 Type-C Connector   |  |  |  |  |
| DP  | 2 x DP++   |  |  |  |  |
| HDMI  | 2 x HDMI 2.0b  |  |  |  |  |
| Audio   | Line out, Mic in   |  |  |  |  |
|   | Onboard I/O  |  |  |  |  |

|  | COM1/2/4/5/6 support RS232   |  |  |
|--|--|--|--|
|  | 5 x 2 x 5 pin, pitch 2.00mm connector for COM1~2 and COM4~COM6 to support          |  |  |
|  | RS232  |  |  |
|  | 5 x 2 x 3 pin, pitch 2.54mm connector for COM1~2 and COM4~COM6 pin9                |  |  |
| COM  | RI/5V/12V jumper select.   |  |  |
| COM  |  |  |  |
|  | COM3: support RS232/422/485  |  |  |
|  | 1 x 2 x 5 pin, pitch 2.00mm connector for COM3 to support RS232/RS422/RS485 by     |  |  |
|  | BIOS Selection   |  |  |
|  | 1 x 2 x 3 pin, pitch 2.54mm connector for COM3 pin9 RI/5V/12V jumper select.       |  |  |
| USB 2.0  | 4 x 2 x 5 pin, pitch 2.54mm connector for 8 x USB 2.0                              |  |  |
| USB 3.2  | 1 x 2 x 10 pin, pitch 2.00mm connector for 2 x USB 3.2 Gen 1×1                     |  |  |
| GPIO   | 1 x 2 x 6 pin, pitch 2.00mm connector for GPIO: 8 bits                             |  |  |
|  | 1 x 1 x 4 pin, pitch 2.54mm CPU fan connector with smart fan function supported    |  |  |
| CPU/System FAN   | 1 x 1 x 4 pin, pitch 2.54mm System fan connector with smart fan function supported |  |  |
|  | 1 x 1 x 4 pin, pitch 2.54mm System fan connector with smart fan function supported |  |  |
| Buzzer Onboard Buzzer  |  |  |  |
| Front Panel1 x 2 x 5 pin, pitch 2.54mm connector for front panel |  |  |  |
| RTC Battery  | 1 x Horizontal type battery connector (CR2032 Coin Battery)                        |  |  |
|  | 1 x 1 x 3 pin pitch 2.00mm connector for AT/ATX jumper                             |  |  |
| AT/ATX Selector  | 1 x 2 x 12 pin ATX power connector   |  |  |
|  | 1 x 2 x 4 pin ATX 12V power connector  |  |  |
| Clear CMOS 1 x 1 x 3pin, pitch 2.00mm connector for CMOS Clear   |  |  |  |
| I2C         1 x 1 x 4 pin, pitch 2.00mm connector for I2C        |  |  |  |
| SMBus  | 1 x 1 x 5 pin, pitch 2.54mm connector for SMBus                                    |  |  |
| Chassis Intrusion  | 1 x 1 x 2 pin, pitch 2.54mm connector for Chassis Intrusion Switch                 |  |  |
| PS/2 KB&MS   | 1 x 1 x 6 pin, pitch 2.54mm connector for PS/2 KB&MS                               |  |  |
| LAN LED  | 1 x 2 x 5 pin, pitch 2.54mm connector for LAN LED status connector                 |  |  |
| BIOS SPI   | 1 x 2 x 4 pin, pitch 2.54mm connector for BIOS SPI                                 |  |  |
| eSPI   | 1 x 2 x 5 pin, pitch 2.00mm connector for eSPI                                     |  |  |
| SMBus  | 1 x 1 x 5 pin, pitch 2.00mm connector for SMBus                                    |  |  |
| ME   | 1 x 1 x 3 pin, pitch 2.00mm connector for ME                                       |  |  |
| Audio  | 1 x 2 x 5 pin, pitch 2.54mm connector for front Audio                              |  |  |
|  | 1 x 1 x 4 pin, pitch 2.00mm connector for Amplifier                                |  |  |
|  | Display  |  |  |
| Graphic Chipset  | Intel® 12th /13th Generation CPU integrated  |  |  |
| Spec. &  | 2 x HDMI 2.0b 4K@60Hz  |  |  |
| Resolution   | 2 x Dual Mode DisplayPort 1.4a 4K@60Hz   |  |  |
| Multiple Display   | tiple Display 4 Independent Displays   |  |  |

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| Ethernet   |   |  |  |  |  |
|--|---|--|--|--|--|
| LAN Chipset 2 x Intel® i225-LM 2.5G Gigabit Controller |   |  |  |  |  |
| LAN Spec.  | LAN Spec. Intel® i225-LM: 10/100/1000/2500 Base-Tx GbE compatible |  |  |  |  |
|  | Mechanical & Environmental Specification                          |  |  |  |  |
| Power  | +12V / +5V / 5VSB /+3 3V /-12V                                    |  |  |  |  |
| Requirement  | 12V/ 13V/ 3V3D/T3.3V/-12V   |  |  |  |  |
| ACPI   | ACPI Single power ATX Support S0, S3, S4, S5                      |  |  |  |  |
| Power Mode   | AT / ATX mode Switchable Through Jumper                           |  |  |  |  |
|  | 0~60°C (32~140°F), 0.5m/s airflow                                 |  |  |  |  |
|  | **Note: Intel PTAT suggests**                                     |  |  |  |  |
| Operating Temp.  | Turbo off   |  |  |  |  |
|  | Workload – IA 100% / GT 100%                                      |  |  |  |  |
|  | PL2(Power Limit) set as default                                   |  |  |  |  |
| Storage Temp.  | -20~ +80°C (-4 ~ 176°F)   |  |  |  |  |
| Operating  | 10°C @ 5% to 00% Polativo Humidity. Non condensing                |  |  |  |  |
| Humidity   | 40 C @ 5% to 90% Relative Humidity, Non-condensing                |  |  |  |  |
| Size (L x W)   | 12" x 9.6" (304.8mm x 243.84mm)                                   |  |  |  |  |
| Weight   | 1.85lbs (0.84kg)  |  |  |  |  |
|  | Package Vibration Test  |  |  |  |  |
|  | Reference IEC60068-2-64 Testing procedures                        |  |  |  |  |
|  | Test Fh: Vibration broadband random Test                          |  |  |  |  |
|  | 1. PSD: 0.026G²/Hz, 2.16 Grms                                     |  |  |  |  |
|  | 2. Non-operation mode   |  |  |  |  |
|  | 3. Test Frequency: 5-500Hz  |  |  |  |  |
|  | 4. Test Axis: X,Y and Z axis                                      |  |  |  |  |
|  | 5. 30 min. per each axis  |  |  |  |  |
|  | 6. IEC 60068-2-64 Test: Fh  |  |  |  |  |
|  |   |  |  |  |  |
| Vibration Test   | Random Vibration Operation  |  |  |  |  |
| VIDIATION TEST   | Reference IEC60068-2-64 Testing procedures                        |  |  |  |  |
|  | Test Fh : Vibration broadband random Test                         |  |  |  |  |
|  | 1. PSD: 0.00202023G²/Hz 0.5 Grms                                  |  |  |  |  |
|  | 2. Operation mode   |  |  |  |  |
|  | 3. Test Frequency : 5-500Hz                                       |  |  |  |  |
|  | 4. Test Axis : X,Y and Z axis                                     |  |  |  |  |
|  | 5. 30 minutes per each axis                                       |  |  |  |  |
|  | 6. IEC 60068-2-64 Test:Fh   |  |  |  |  |
|  | Random Vibration Non Operation                                    |  |  |  |  |
|  | Reference IEC60068-2-64 Testing procedures                        |  |  |  |  |

| Test Fh : Vibration broadband random Test |   |  |
|---|---|--|
|   | 1. PSD: 0.00202023G²/Hz 0.5 Grm   |  |
|   | 2. Non Operation mode   |  |
|   | 3. Test Frequency : 5-500Hz   |  |
|   | 4. Test Axis : X,Y and Z axis   |  |
|   | 5. 30 minutes per each axis   |  |
|   | 6. IEC 60068-2-64 Test:Fh   |  |
|   | Package Drop  |  |
|   | Reference ISTA 2A, Method : IEC-60068-2-32 Test: Ed                             |  |
| Drop Test                                 | Drop Test   |  |
|   | 1 One corner , three edges, six faces   |  |
|   | 2 ISTA 2A, IEC-60068-2-32 Test:Ed   |  |
|   | BIOS Support:   |  |
|   | Win11 64bit UEFI  |  |
|   | **Note: Windows 11 is not a LTSC release and will be supported on the Intel CCG |  |
| OS Information                            | Client roadmap.   |  |
| 05 mormation                              | NEX Network & Edge customers may install non-LTSC releases(e.g. Win11) on       |  |
|   | NEX Network & Edge processors.**  |  |
|   | Win10 64bit UEFI  |  |
|   | Linux   |  |



**Note:** Specifications are subject to change without notice.

# 1.6 Architecture Overview—Block Diagram

The following block diagram shows the architecture and main components of BC680R.



# 2. Hardware Configuration



### 2.1 Product Overview

# 2.2 Jumper and Connector List

You can configure your board to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch.

It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To "close" a jumper you connect the pins with the clip. To "open" a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case, you would connect either two pins.



The jumper settings are schematically depicted in this manual as follows:

| 0 0  |        | 1 2 3<br>O |
|------|--------|------------|
| Open | Closed | Closed 2-3 |

A pair of needle-nose pliers may be helpful when working with jumpers.

Intel Front Panel connector

ATX power connectors

Connectors on the board are linked to external devices such as hard disk drives, a keyboard, or floppy drives. In addition, the board has a number of jumpers that allow you to configure your system to suit your application.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

| Jumpers    |                       |                            |
|------------|-----------------------|----------------------------|
| Label      | Function              | Note                       |
| CLCMOS1    | Clear CMOS            | 3 x 1 header, pitch 2.00mm |
| JPSON1     | AT/ATX Mode Select    | 3 x 1 header, pitch 2.00mm |
| JCOMPWR1~6 | COM1~6 POWER SETTING  | 3 x 2 header, pitch 2.00mm |
|            |                       |                            |
| Connectors |                       |                            |
| Label      | Function              | Note                       |
| CPU_FAN1   | CPU Fan connector     | 4 x 1 wafer, pitch 2.54mm  |
| CHA_FAN1   | Chassis Fan connector | 4 x 1 wafer, pitch 2.54mm  |
| CHA_FAN2   | Chassis Fan connector | 4 x 1 wafer, pitch 2.54mm  |

5 x 2 header, pitch 2.54mm

12 x 2 wafer, pitch 4.20mm

The following tables list the function of each of the board's jumpers and connectors.

F\_PANEL1

ATX1

| ATX12V1                 | 12V ATX power connectors     | 4 x 2 wafer, pitch 4.20mm              |
|-------------------------|------------------------------|--|
| COM1~6                  | Serial Port Connector        | 5 x 2 header, pitch 2.00mm             |
| SATA1~4                 | SATA Connector               | Male connector (Red)                   |
| FP_ Audio               | Front Panel Audio Connector  | 5 x 2 header, pitch 2.54mm             |
| JDIO1                   | Digital I/O Connector        | 6 x 2 wafer, pitch 2.00mm              |
| I2C1                    | I2C connector                | 4 x 1 wafer, pitch 2.00mm              |
| USB89                   | Front USB 3.2 Header         | 10 x 2 header, pitch 2.00mm            |
| USB1011~USB161          | 7 Front USB 2.0 Headers      | 5 x 2 header, pitch 2.54mm             |
| KBMS1                   | PS/2 Header                  | 5 x 1 wafer, pitch 2.50mm              |
| SMB1                    | SMBus connector              | 5 x 1 wafer, pitch 2.00mm              |
| JAMP1                   | Amplifier Connector          | 4 x 1 wafer, pitch 2.00mm              |
| JCASE1                  | Chassis Intrusion Header     | 2 x 1 wafer, pitch 2.50mm              |
| LANLED1                 | LAN LED Header               | 5 x 2 header, pitch 2.54mm             |
| CPU1                    | LGA1700 socket               |  |
| DIMMA1~B2               | DDR5 UDIMM Slot              | Dual channel. (2 DIMMs per<br>channel) |
| PCIEX1_1/<br>PCIEX1_5   | PCIe x1 Gen3                 | X1 (Slot 1,5)                          |
| PCIEX16_2               | PCIe x16 Gen5                | X16 (Slot 2)                           |
| PCIEX16_3               | PCle x4 Gen3                 | X16 Physical yellow (Slot 3)           |
| PCIEx16_4/<br>PCIEx16_7 | PCIe x4 Gen4                 | X16 Physical yellow (Slot 4,7)         |
| PCIEx16_6               | PCIe x1 Gen3                 | X16 Physical yellow (Slot 6)           |
| HDMI1/2                 | HDMI port Connector x 2      |  |
| DP1/2                   | Display port connector x 2   |  |
| USB56                   | USB 3.2 Type A Connector x 2 |  |
| USB7                    | USB 3.2 Type C Connector x 1 |  |
| LAN1_USB12/             | RJ-45 Ethernet Connector x 1 | 2.5 Gigabit Ethorpot                   |
| LAN2_USB34              | USB3.2 Type A Connector x 2  |  |
| AUDIO1                  | Audio phone jack             | Line-out, Mic-in                       |

# 2.3 Setting Jumpers & Connectors 2.3.1 Clear CMOS (CLCMOS1)







#### **Clear CMOS**

| 1 | 3 |
|---|---|

\* Default

### 2.3.2 AT/ATX Power Mode Select (JPSON1)





#### \* Default

# 2.3.3 COM POWER SETTING (JCOMPWR1~6)



2.3.4



**CPU fan connector (CPUFAN1)** 

| PIN |
|-----|
| 1   |
| 2   |
| 3   |
| 4   |
|     |

# 2.3.5 System fan connector (CHA\_FAN 1)





| Signal     | PIN |
|------------|-----|
| GND        | 1   |
| +12V       | 2   |
| FAN_SPEED2 | 3   |
| FAN_PWM2   | 4   |

# 2.3.6 System fan connector (CHA\_FAN 2)





| Signal     | PIN |
|------------|-----|
| FAN_PWM3   | 4   |
| FAN_SPEED3 | 3   |
| +12V       | 2   |
| GND        | 1   |

# 2.3.7 System Panel (F\_PANEL)



| Signal   | PIN | PIN | Signal   |
|----------|-----|-----|----------|
| HHD LED+ | 1   | 2   | +5VSB    |
| HDD LED# | 3   | 4   | PWR LED# |
| GND      | 5   | 6   | PANSWIN# |
| RST      | 7   | 8   | GND      |
| NC       | 9   |     |          |

#### 2.3.8 ATX Power connector (ATXPWR1)





| Signal   | PIN | PIN | Signal |
|----------|-----|-----|--------|
| +3V      | 1   | 13  | +3V    |
| +3V      | 2   | 14  | -12V   |
| GND      | 3   | 15  | GND    |
| +5V      | 4   | 16  | PS_ON  |
| GND      | 5   | 17  | GND    |
| +5V      | 6   | 18  | GND    |
| GND      | 7   | 19  | GND    |
| PWRER OK | 8   | 20  | NC     |
| +5VSB    | 9   | 21  | +5V    |
| +12V     | 10  | 22  | +5V    |
| +12V     | 11  | 23  | +5V    |
| +3V      | 12  | 24  | GND    |

# 2.3.9 ATX Power connector (ATXPWR1)





| Signal | PIN | PIN | Signal |
|--------|-----|-----|--------|
| GND    | 4   | 8   | +12V   |
| GND    | 3   | 7   | +12V   |
| GND    | 2   | 6   | +12V   |
| GND    | 1   | 5   | +12V   |

### 2.3.10 Serial Port connectors (COM1~6)





| Signal | PIN | PIN | Signal        |
|--------|-----|-----|---------------|
|        |     | 9   | RI3xPOWERxJMP |
| CTS#   | 8   | 7   | RTS#          |
| DSR#   | 6   | 5   | GND           |
| DTR#   | 4   | 3   | ТХ            |
| RX     | 2   | 1   | DCD#          |

# 2.3.11 Serial ATA Connector (SATA2, SATA4)





| PIN | Signal |
|-----|--------|
| 1   | GND    |
| 2   | TX+    |
| 3   | TX-    |
| 4   | GND    |
| 5   | RX-    |
| 6   | RX+    |
| 7   | GND    |

# 2.3.12 Serial ATA Connector (SATA1, SATA3)





| PIN | Signal |  |  |  |
|-----|--------|--|--|--|
| 7   | GND    |  |  |  |
| 6   | RX+    |  |  |  |
| 5   | RX-    |  |  |  |
| 4   | GND    |  |  |  |
| 3   | TX-    |  |  |  |
| 2   | TX+    |  |  |  |
| 1   | GND    |  |  |  |

# BC680R User's Manual 2.3.13 USB connectors (USB2\_HR1, USB2\_HR2, USB2\_HR3, USB2\_HR4)





| Signal | PIN | PIN | Signal |
|--------|-----|-----|--------|
| USB+5V | 1   | 2   | USB+5V |
| USB -  | 3   | 4   | USB -  |
| USB +  | 5   | 6   | USB +  |
| GND    | 7   | 8   | GND    |
|        |     | 9   | NC     |

# 2.3.14 USB3.2 connector (USB89)





| Signal   | PIN | PIN | Signal   |
|----------|-----|-----|----------|
| NC       | 10  | 11  | USB+     |
| USB+     | 9   | 12  | USB-     |
| USB-     | 8   | 13  | GND      |
| GND      | 7   | 14  | USB3_TX+ |
| USB3_TX+ | 6   | 15  | USB3_TX- |
| USB3_TX- | 5   | 16  | GND      |
| GND      | 4   | 17  | USB3_RX+ |
| USB3 RX+ | 3   | 18  | USB3_RX- |
| USB3 RX- | 2   | 19  | +5V      |
| +5V      | 1   |     |          |

# 2.3.15 8 bit GPIO header (JDIO1)





| Signal    | PIN | PIN | Signal    |
|-----------|-----|-----|-----------|
| SIO_GPIO4 | 2   | 1   | SIO_GPIO0 |
| SIO_GPIO5 | 4   | 3   | SIO_GPIO1 |
| SIO_GPIO6 | 6   | 5   | SIO_GPIO2 |
| SIO_GPIO7 | 8   | 7   | SIO_GPIO3 |
| SMB_DATA_ | 10  | 0   | SMB_CLK_  |
| RESUME    | 10  | 9   | RESUME    |
| +5Vsb     | 12  | 11  | GND       |

# 2.3.16 Front Audio connector (FP\_AUDIO1)



| _     |     | -    |
|-------|-----|------|
|       | •   | 9    |
|       | • • | Щт   |
| l • 1 | •   |      |
| l • 1 | • 1 | rf – |
| •     | •   | 1    |

| Signal   | PIN | PIN | Signal |
|----------|-----|-----|--------|
| LINE2-JD | 10  | 9   | LINE2L |
|          |     | 7   | SENSEB |
| MIC2-JD  | 6   | 5   | LINE2R |
| +3.3V    | 4   | 3   | MIC2R  |
| GND      | 2   | 1   | MIC2L  |

# BC680R User's Manual 2.3.17 Amplifier connector (JAMP1)





| 2 | AMP_L+ |
|---|--------|
| 3 | AMP_R- |
| 4 | AMP R+ |

# 2.3.18 SM bus connector (SMB1)





| PIN | Signal   |
|-----|----------|
| 1   | SMB_CLK  |
| 2   | SMB_DATA |
| 3   | SMB_ALT  |
| 4   | GND      |
| 5   | +3.3V    |

# 2.3.19 LAN LED status connector (LAN\_LED1)



| 9 |  | 1 |
|---|--|---|
|   |  |   |
|   |  |   |

| Signal   | PIN | PIN | Signal   |
|----------|-----|-----|----------|
| +3V_Dual | 1   | 2   | +3V_Dual |
| LAN1_LED | 3   | 4   | GND      |
| +3V_Dual | 5   | 6   | +3V_Dual |
| GND      | 7   | 8   | GND      |
| +3V_Dual | 9   | 10  | +3V_Dual |

# 2.3.20 Chassis intrusion connector (JCASE1)



| PIN | Signal        |  |
|-----|---------------|--|
| 1   | SIO_CASEOPEN# |  |
| 2   | GND           |  |



### 3.1 BIOS setup

Once you enter the Aptio Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.

#### 3.6.1 Main Menu

This section allows you to record some basic hardware configurations in your computer and set the system clock.

| Main Advanced Chipset Sec  | Aptio Setup – AMI<br>urity Boot Save & Exit MEBx  |   |
|--|---|---|
| Main Advanced Chipset Sec<br>BIOS Information<br>BIOS Vendor<br>Compliancy<br>Project Version<br>Build Date and Time<br>Access Level<br>Memory Information<br>Total Memory<br>Memory Frequency<br>Power Type<br>System Date<br>System Time | Unity Boot Save & Exit MEEx<br>American Megatrends<br>5.25 0.08 x64<br>UEFI 2.8: PI 1.7<br>BC680R #71831 BIOS V0.31<br>06/15/2022 10:26:14<br>Administrator<br>32768 MB<br>4400 MHz<br>[ATX Mode]<br>[Fri 05/16/2098]<br>[07:52:47] | Set the Date. Use Tab to<br>switch between Date elements.<br>Default Ranges:<br>Year: 1998-9999<br>Months: 1-12<br>Days: Dependent on month<br>Range of Years may vary.<br>++: Select Screen<br>11: Select Item<br>Enter: Select<br>+/-: Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F3: Optimized Defaults<br>F4: Save & Exit<br>ESC: Exit |
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### 3.6.1.1 System Date

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

#### 3.6.1.2 System Time

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



**Note:** The BIOS setup screens shown in this chapter are for reference purposes only, and may not exactly match what you see on your screen. Visit the Avalue website (<u>www.avalue.com.tw</u>) to download the latest product and BIOS information.

#### 3.6.2 Advanced Menu

This section allows you to configure your CPU and other system devices for basic operation through the following sub-menus.

| Main Advanced Chipset Securi  | Aptio Setup – Al<br>y Boot Save & Exit | 1I<br>MEB×   |
|---|--|--|
| <ul> <li>CPU Configuration</li> <li>Power &amp; Performance</li> <li>PCH-FW Configuration</li> <li>Thunderbolt(TM) Configuration</li> <li>Trusted Computing</li> <li>ACPI Settings</li> <li>NCT6126D Super IO Configuration</li> <li>Hardware Monitor</li> <li>SS RTC Wake Settings</li> <li>Serial Port Console Redirection</li> <li>Intel TXT Information</li> <li>USB Configuration</li> <li>Network Stack Configuration</li> <li>NVMe Configuration</li> <li>Remote Server Configuration</li> </ul> |  | CPU Configuration Parameters<br>++: Select Screen<br>11: Select Item<br>Enter: Select<br>+/-: Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F3: Optimized Defaults<br>F4: Save & Exit<br>ESC: Exit |
| Versid  | n 2.22.1284 Copyrigh                   | t (C) 2022 AMI   |

#### 3.6.2.1 CPU Configuration



User's Manual

| Item                                     | Options   | Description   |
|--|---|---|
| Intel (VMX) Virtualization<br>Technology | Disabled<br>Enabled <b>[Default]</b> ,                              | When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.   |
| Active Performance-cores                 | All <b>[Default]</b> ,<br>/7/6/5/4/3/2/1                            | Number of P-cores to enable in each<br>processor package. Note: Number of Cores<br>and E-cores are looked at together. When<br>both are {0,0}, Pcode will enable all cores. |
| Active Efficient-cores                   | All <b>[Default]</b> ,<br>15/14/13/12/11/10<br>/9/8/7/6/5/4/3/2/1/0 | Number of E-cores to enable in each<br>processor package. Note: Number of Cores<br>and E-cores are looked at together. When<br>both are {0,0}, Pcode will enable all cores. |
| Hyper-Threading                          | Disabled<br>Enabled <b>[Default]</b> ,                              | Enable or Disable Hyper-Threading<br>Technology.  |
| Intel Trusted Execution<br>Technology    | Disabled <b>[Default]</b> ,<br>Enabled                              | Enabled utilization of additional hardware<br>capabilities provided by Intel (R)Trusted<br>Execution Technology. Changes require a full<br>power cycle to take effect.      |

# 3.6.2.2 CPU - Power Management Control

| Main   | Aptio Setup — AMI  |   |
|--|--|---|
| CPU – Power Management Control<br>Intel(R) SpeedStep(tm)<br>Turbo Mode<br>C states<br>Enhanced C-states<br>Package C State Limit | [Enabled]<br>[Enabled]<br>[Enabled]<br>[Enabled]<br>[C3] | Allows more than two frequency<br>ranges to be supported.   |
|  |  | <pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre> |
| Version  | 2.22.1284 Copyright (C) 2022                             | 2 AMI   |

| Item                   | Options                                | Description  |
|------------------------|--|--|
| Intel(R) SpeedStep(tm) | Disabled<br>Enabled <b>[Default]</b> , | Allows more than two frequency ranges to be supported. |

| Turbo Mode            | Disabled<br>Enabled <b>[Default]</b> ,   | Enable/Disable processor Turbo Mode<br>(requires EMTTM enabled too). AUTO means<br>enabled.  |
|-----------------------|--|--|
| C states              | Disabled<br>Enabled <b>[Default]</b> ,   | Enable/Disable CPU Power Management.<br>Allows CPU to go to C states when it's not<br>100% utilized.   |
| Enhanced C-states     | Disabled<br>Enabled <b>[Default]</b> ,   | Enable/Disable C1E. When enabled, CPU will switch to minimum speed when all cores enter C-state.   |
| Package C State Limit | C0/C1<br>C2<br>C3 <b>[Default]</b> ,<br>C6<br>C7<br>C8<br>C9<br>C10<br>Cpu Default | Maximum Package C State Limit Setting. Cpu<br>Default: Leaves to Factory default value Auto:<br>Initializes to deepest available Package C<br>State Limit. |

# 3.6.2.3 PCH-FW Configuration

| Advanced   | Aptio Setup — AMI   |   |
|--|---|---|
| ME Firmware Version<br>ME Firmware Mode<br>ME Firmware SKU<br>ME Firmware Status 1<br>ME Firmware Status 2<br>ME Firmware Status 3<br>ME Firmware Status 4<br>ME Firmware Status 5<br>ME Firmware Status 6 | 16.0.15.1620<br>Normal Mode<br>Consumer SKU<br>0x90000255<br>0x39850106<br>0x00000020<br>0x00000000<br>0x00000000<br>0x00000000 | When Disabled ME will be put<br>into ME Temporarily Disabled<br>Mode.   |
| ME UnLock Control  | [Lock]  | <pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre> |
| Ver:   | sion 2.22.1284 Copyright (C)  | 2022 AMI  |

| Item              | Options                                | Description  |
|-------------------|--|--|
| ME State          | Disabled<br>Enabled <b>[Default]</b> , | When Disabled ME will be put into ME Temporarily Disabled Mode.                  |
| ME UnLock Control | Lock <b>[Default]</b> ,<br>Unlock      | ME UnLock control function. Set UnLock will system shutdown for active function. |

| Advanced                         | Aptio Setup — AMI            |   |
|----------------------------------|------------------------------|---|
| Discrete Thunderbolt(TM) Support | [Disabled]                   | Enable or Disable Discrete<br>Thunderbolt(TM) Support.<br>+: Select Screen<br>fl: Select Item<br>Enter: Select<br>+/-: Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F3: Optimized Defaults<br>F4: Save & Exit<br>ESC: Exit |
| Version                          | 2.22.1284 Copyright (C) 2022 | AMI   |

# 3.6.2.4 Thunderbolt(TM) Configuration

| Item                     | Option                      | Description                                  |
|--------------------------|-----------------------------|--|
| Discrete Thunderbolt(TM) | Disabled <b>[Default]</b> , | Enabled or Disabled Discrete Thunderbolt(TM) |
| Support                  | Enabled                     | Support.                                     |

# 3.6.2.5 Trusted Computing

| Advanced   | Aptio Setup – AMI   |  |
|--|---------------------|--|
| Configuration<br>TPM Device Selection<br>Security Device Support<br>NO Security Device Found | [dTPM]<br>[Disable] | Selects TPM device: PTT or<br>dTPM. PTT - Enables PTT in<br>SkuMgr dTPM 1.2 - Disables PTT<br>in SkuMgr Warning ! PTT/dTPM<br>will be disabled and all data<br>saved on it will be lost.   |
|  | TPM Device Selectio | <pre>https://www.select.com/action/ac</pre> |
| Version 2.22.1284 Copyright (C) 2022 AMI   |                     |  |

| ltem                       | Options                                | Description   |
|----------------------------|--|---|
| TPM Device Selection       | dTPM <b>[Default]</b> ,<br>PTT         | Selects TPM device: PTT or dTPM. PTT - Enables PTT in<br>SkuMgr dTPM 1.2 - Disables PTT in SkuMgr Warning !<br>PTT/dTPM will be disabled and all data saved on it will be lost. |
| Security Device<br>Support | Disabled <b>[Default]</b> ,<br>Enabled | Enables or Disables BIOS support for security device. O.S. will<br>not show Security Device. TCG EFI protocol and INT1A<br>interface will not available.                        |

# 3.6.2.6 ACPI Settings

| Main   | Aptio Setup — AMI  |   |
|--|--|---|
| ACPI Settings<br>Enable Hibernation<br>ACPI Sleep State<br>S3 Video Repost<br>PCIE# Wake from S5<br>Wake on Ring | [Enabled]<br>[S3 (Suspend to RAM)]<br>[Disabled]<br>[Disabled]<br>[Disabled] | Enables or Disables System<br>ability to Hibernate (OS/S4<br>Sleep State). This option may<br>not be effective with some<br>operating systems.                        |
|  |  | <pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre> |
|  | rsion 2.22.1284 Copyright (C) 20   | 22 AMI  |

| Item               | Options   | Description  |
|--------------------|---|--|
| Enable Hibernation | Disabled<br>Enabled <b>[Default]</b> ,                    | Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may not be effective with some operating systems. |
| ACPI Sleep State   | Suspend Disabled,<br>S3 (Suspend to RAM) <b>[Default]</b> | Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.                                      |
| S3 Video Repost    | Disabled <b>[Default]</b> ,<br>Enabled                    | Enable or disable S3 video repost  |
| PCIE# Wake from S5 | Disabled <b>[Default]</b> ,<br>Enabled                    | Enable or disable PCIE to wake the system from S5.   |
| Wake on Ring       | Disabled <b>[Default]</b> ,<br>Enabled                    | Enables/Disables wake on ring function under ACPI S3/S4/S5.  |
### 3.6.2.7 NCT6126D Super IO Configuration

You can use this item to set up or change the Super IO configuration for serial ports. Please refer to  $3.6.2.5.1 \sim 3.6.2.5.6$  for more information.

| Advanced  | Aptio Setup — AMI                         |   |
|---|---|---|
| NCT6126D Super IO Configuration   |   | Set Parameters of Serial Port 1   |
| Super IO Chip<br>> Serial Port 1 Configuration<br>> Serial Port 2 Configuration<br>> Serial Port 3 Configuration<br>> Serial Port 4 Configuration<br>> Serial Port 5 Configuration<br>> Serial Port 6 Configuration | NCT6126D                                  |   |
| WatchDog Count Mode<br>WatchDog TimeOut Value<br>Chassis Opened Warning<br>ErP/EuP S5 Support   | [Second]<br>O<br>[Disabled]<br>[Disabled] | <pre>++: Select Screen 14: Select Item Enter: Select 4/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre> |
| Version   | 2.22.1284 Copyright (C) 2022              | 2 AMI   |

| Item                        | Options                                 | Description   |
|-----------------------------|---|---|
| WatchDog Count Mode         | Second <b>[Default]</b> ,<br>Minute     | Configure watchdog count mode.  |
| WatchDog Timeout Value      | 0                                       | Configure watchdog Timeout Value.   |
| Chassis Opened Warning      | Disabled <b>[Default]</b> ,<br>Enabled  | Select whether to enable Chassis Intrusion<br>Detection. Chassis Intrusion Detection is a utility<br>that can tell whether someone has opened the<br>case (intruded into the chassis). NOTE-If<br>chassis tamper occurs, you can only enter setup<br>to clear this error. |
| ErP/EuP S5 Support          | Disabled <b>[Default]</b> ,<br>Enabled  | Enable/Disable ErP/EuP S5 Support<br>NOTE:When MEBx is enable Activate Network<br>Access, this function can not set enable that will<br>cause ME fail on next boot.   |
| Serial Port 1 Configuration | Set Parameters of Serial Port 1 (COMA). |   |
| Serial Port 2 Configuration | Set Parameters of Serial Port 2 (COMB). |   |
| Serial Port 3 Configuration | Set Parameters of Serial Port 3 (COMC). |   |
| Serial Port 4 Configuration | Set Parameters of Serial Port 4 (COMD). |   |
| Serial Port 5 Configuration | Set Parameters of Serial Port 5 (COME). |   |
| Serial Port 6 Configuration | Set Parameters of Serial Port 6 (COMF). |   |

### BC680R User's Manual 3.6.2.7.1 Serial Port 1 Configuration



| ltem            | Option  | Description                                       |
|-----------------|---|---|
| Serial Port     | Disabled<br>Enabled <b>[Default]</b> ,  | Enable or Disable Serial Port (COM)               |
| Change Settings | Auto <b>[Default]</b> ,<br>IO=3F8h; IRQ4;<br>IO=3F8h; IRQ3,4,5,6,7,9,10,11,12;<br>IO=2F8h; IRQ3,4,5,6,7,9,10,11,12;<br>IO=3E8h; IRQ3,4,5,6,7,9,10,11,12;<br>IO=2E8h; IRQ3,4,5,6,7,9,10,11,12; | Select an optimal settings for Super IO<br>Device |

# 3.6.2.7.2 Serial Port 2 Configuration

| Advanced                       | Aptio Setup — AMI            |   |
|--------------------------------|------------------------------|---|
| Serial Port 2 Configuration    |                              | Enable or Disable Serial Port                         |
| Serial Port<br>Device Settings | [Enabled]<br>IO=2F8h; IRQ=3; |   |
| Change Settings                | [Auto]                       |   |
|                                |                              |   |
|                                |                              |   |
|                                |                              | ++: Select Screen<br>↑↓: Select Item                  |
|                                |                              | Enter: Select<br>+/−: Change Opt.<br>E1: General Heln |
|                                |                              | F2: Previous Values<br>F3: Optimized Defaults         |
|                                |                              | F4: Save & Exit<br>ESC: Exit                          |
|                                |                              |   |
| Version 2                      | .22.1289 Conuright (C) 2023  | АМТ   |

| Item            | Option  | Description                                       |
|-----------------|---|---|
| Serial Port     | Disabled<br>Enabled <b>[Default]</b> ,  | Enable or Disable Serial Port (COM)               |
| Change Settings | Auto <b>[Default]</b> ,<br>IO=2F8h; IRQ3;<br>IO=3F8h; IRQ3,4,5,6,7,9,10,11,12;<br>IO=2F8h; IRQ3,4,5,6,7,9,10,11,12;<br>IO=3E8h; IRQ3,4,5,6,7,9,10,11,12;<br>IO=2E8h; IRQ3,4,5,6,7,9,10,11,12; | Select an optimal settings for Super IO<br>Device |

### BC680R User's Manual 3.6.2.7.3 Serial Port 3 Configuration





| ltem            | Option  | Description                                       |
|-----------------|---|---|
| Serial Port     | Disabled<br>Enabled <b>[Default]</b> ,  | Enable or Disable Serial Port (COM)               |
| Change Settings | Auto <b>[Default]</b> ,<br>IO=3E8h; IRQ5;<br>IO=3E8h; IRQ3,4,5,6,7,9,10,11,12;<br>IO=2E8h; IRQ3,4,5,6,7,9,10,11,12;<br>IO=220h; IRQ3,4,5,6,7,9,10,11,12;<br>IO=228h; IRQ3,4,5,6,7,9,10,11,12; | Select an optimal settings for Super IO<br>Device |

# 3.6.2.7.4 Serial Port 4 Configuration

|                                | Aptio Setup – AMI   |   |
|--------------------------------|---|---|
| Advanced                       |   |   |
| Serial Port 4 Configuration    |   | Select an optimal settings for  |
| Serial Port<br>Device Settings | [Enabled]<br>IO=2E8h; IRQ=10;   | Super 10 Device   |
| Change Settings                |   |   |
|                                | Change Settings<br>Auto<br>IO=2E8h; IRQ=10;<br>IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12<br>IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12<br>IO=228h; IRQ=3,4,5,6,7,9,10,11,12<br>IO=228h; IRQ=3,4,5,6,7,9,10,11,12 | Select Screen<br>Select Item<br>r: Select<br>Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F3: Optimized Defaults<br>F4: Save & Exit<br>ESC: Exit |
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| Item            | Option   | Description                                       |
|-----------------|--|---|
| Serial Port     | Disabled<br>Enabled <b>[Default]</b> ,   | Enable or Disable Serial Port (COM)               |
| Change Settings | Auto <b>[Default]</b> ,<br>IO=2E8h; IRQ10;<br>IO=3E8h; IRQ3,4,5,6,7,9,10,11,12;<br>IO=2E8h; IRQ3,4,5,6,7,9,10,11,12;<br>IO=220h; IRQ3,4,5,6,7,9,10,11,12;<br>IO=228h; IRQ3,4,5,6,7,9,10,11,12; | Select an optimal settings for Super IO<br>Device |

## 3.6.2.7.5 Serial Port 5 Configuration



| Item            | Option  | Description                                       |
|-----------------|---|---|
| Serial Port     | Disabled<br>Enabled <b>[Default]</b> ,  | Enable or Disable Serial Port (COM)               |
| Change Settings | Auto <b>[Default]</b> ,<br>IO=228h; IRQ=15;<br>IO=3E8h; IRQ3,4,5,6,7,9,10,11,12;<br>IO=2E8h; IRQ3,4,5,6,7,9,10,11,12;<br>IO=220h; IRQ3,4,5,6,7,9,10,11,12;<br>IO=228h; IRQ3,4,5,6,7,9,10,11,12; | Select an optimal settings for Super IO<br>Device |

## 3.6.2.7.6 Serial Port 6 Configuration

| Advanced                       | Aptio Setup – AMI  |   |
|--------------------------------|--|---|
| Serial Port 6 Configuration    |  | Select an optimal settings for  |
| Serial Port<br>Device Settings | [Enabled]<br>IO=228h; IRQ=15;  | Super IU Device   |
| Change Settings                |  |   |
|                                | Change Settings<br>Auto<br>IO=220h; IRQ=6;<br>IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12<br>IO=220h; IRQ=3,4,5,6,7,9,10,11,12<br>IO=220h; IRQ=3,4,5,6,7,9,10,11,12<br>IO=228h; IRQ=3,4,5,6,7,9,10,11,12 | Select Screen<br>Select Item<br>r: Select<br>Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F3: Optimized Defaults<br>F4: Save & Exit<br>ESC: Exit |
| V                              | ersion 2.22.1284 Copyright (C) 2022  | AMI   |

| ltem            | Option   | Description                                       |
|-----------------|--|---|
| Serial Port     | Disabled<br>Enabled <b>[Default]</b> ,   | Enable or Disable Serial Port (COM).              |
| Change Settings | Auto <b>[Default]</b> ,<br>IO=220h; IRQ=6;<br>IO=3E8h; IRQ3,4,5,6,7,9,10,11,12;<br>IO=2E8h; IRQ3,4,5,6,7,9,10,11,12;<br>IO=220h; IRQ3,4,5,6,7,9,10,11,12;<br>IO=228h; IRQ3,4,5,6,7,9,10,11,12; | Select an optimal settings for Super IO<br>Device |

### 3.6.2.8 Hardware Monitor

| navanova   |   |   |
|--|---|---|
| PC Health Status<br>> Smart Fan<br>CPU Temperature (PECI)<br>SYS Temperature<br>CPU_FAN Speed<br>CHA_FAN1 Speed<br>CHA_FAN2 Speed<br>VCORE<br>+5VSB<br>+5V<br>+12V<br>OVSD<br>3VCC<br>VBAT<br>AVSB | : +42 C<br>: +33 C<br>: 1000 RPM<br>: N/A<br>: N/A<br>: +0.968 V<br>: +5.084 V<br>: +5.056 V<br>: +12.192 V<br>: +3.012 V<br>: +3.312 V<br>: +3.328 V | Smart Fan function page<br>++: Select Screen<br>11: Select Item<br>Enter: Select                                      |
|  |   | +/-: Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F3: Optimized Defaults<br>F4: Save & Exit<br>ESC: Exit |

### 3.6.2.8.1 Hardware Monitor

| Advanced                     | Aptio Setup — AMI           |   |
|------------------------------|-----------------------------|---|
| Smart Fan                    |                             | Smart Fan Function<br>Enable/Disable  |
| Smart Fan Mode Configuration | [EUGDIEO]                   |   |
|                              |                             | ++: Select Screen<br>↑↓: Select Item  |
|                              |                             | Enter: Select<br>+/-: Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F3: Optimized Defaults<br>F4: Save & Exit |
|                              |                             | ESC: Exit   |
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| Item               | Options  | Description                        |
|--------------------|--|------------------------------------|
| Smart Fan Function | Disabled<br>Enabled <b>[Default]</b> ,<br>Manual | Smart fan function Enable/Disabled |

### 3.6.2.8.2 Smart Fan Function

| Advanced   | Aptio Setup — AMI          |   |
|--|----------------------------|---|
| Smart Fan Mode Configuration                           |                            | CPU Smart Fan Target  |
| CPU_FAN1 Smart Fan Target<br>CPU_FAN1 MIN.FAN Speed(%) | [55 C]<br>[12.5%]          | Temperature   |
| CHA_FAN1 Smart Fan Target<br>CHA_FAN1 MIN.FAN Speed(%) | [55 C]<br>[12.5%]          |   |
| CHA_FAN2 Smart Fan Target<br>CHA_FAN2 MIN.FAN Speed(%) | [55 C]<br>[12.5%]          |   |
|  |                            | <pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre> |
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| Advanced   | Aptio Setup — AMI  |  |
|--|--|--|
| Smart Fan Mode Configuration                           |  | CPU Smart Fan minimum settings   |
| CPU_FAN1 Smart Fan Target<br>CPU_FAN1 MIN.FAN Speed(%) | [55 C]<br>[12.5%]  |  |
| CHA_FAN1 Smart Fan Target<br>CHA_FAN1 MIN.FAN Speed(%) | [55 C]<br>[12.5%]  |  |
| CHA_FAN2 Smart Fan Target<br>CHA_FAN2 MIN.FAN Speed(%) | CPU_FAN1 MIN.FAN Speed(%)<br>12.5%<br>25%<br>37.5%<br>50%<br>62.5%<br>75%<br>87.5% | Select Screen<br>Select Item<br>er: Select<br>: Change Opt.<br>General Help<br>F2: Previous Values<br>F3: Optimized Defaults<br>F4: Save & Exit<br>ESC: Exit |
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| Item                         | Options                  | Description                          |
|------------------------------|--------------------------|--------------------------------------|
|                              | Disabled                 |                                      |
|                              | 40C                      |                                      |
|                              | 45C                      |                                      |
| CPU_FAN1 Smart Fan           | 50C                      | CDU Smort FAN Torget Temperature     |
| Target                       | 55C <b>[Default]</b> ,   | CPO Smart PAN Target Temperature     |
|                              | 60C                      |                                      |
|                              | 65C                      |                                      |
|                              | 70C                      |                                      |
|                              | 12.5% <b>[Default]</b> , |                                      |
|                              | 25%                      |                                      |
|                              | 37.5%                    |                                      |
| CPU_FANT MIN.FAN             | 50%                      | CPU Smart FAN minimum settings       |
| Speed(%)                     | 62.5%                    |                                      |
|                              | 75%                      |                                      |
|                              | 87.5%                    |                                      |
|                              | Disabled                 |                                      |
|                              | 40C                      |                                      |
|                              | 45C                      |                                      |
| CHA_FAN1 Smart Fan<br>Target | 50C                      | Chassis Smart EAN Target Temperature |
|                              | 55C <b>[Default]</b> ,   | Chassis Smart PAN Target Temperature |
|                              | 60C                      |                                      |
|                              | 65C                      |                                      |
|                              | 70C                      |                                      |

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| CHA_FAN1 MIN.FAN<br>Speed(%) | 12.5% <b>[Default]</b> ,<br>25%<br>37.5%<br>50%<br>62.5%<br>75%<br>87.5%     | Chassis Smart FAN minimum settings   |
|------------------------------|--|--------------------------------------|
| CHA_FAN2 Smart Fan<br>Target | Disabled<br>40C<br>45C<br>50C<br>55C <b>[Default]</b> ,<br>60C<br>65C<br>70C | Chassis Smart FAN Target Temperature |
| CHA_FAN2 MIN.FAN<br>Speed(%) | 12.5% <b>[Default]</b> ,<br>25%<br>37.5%<br>50%<br>62.5%<br>75%<br>87.5%     | Chassis Smart FAN minimum settings   |

### 3.6.2.9 S5 RTC Wake Settings

| Advanced            | Aptio Setup — AMI               |  |
|---------------------|---------------------------------|--|
| Wake system from S5 | [Disabled]                      | Enable or disable System wake<br>on alarm event. When enabled,<br>System will wake on the<br>hr::min::sec.<br>++: Select Screen<br>fl: Select Item<br>Enter: Select<br>+/-: Change Opt.<br>Fl: General Help<br>F2: Previous Values<br>F3: Optimized Defaults<br>F4: Save & Exit<br>ESC: Exit |
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ItemOptionsDescriptionWake system from S5Disabled[Default],<br/>Fixed Time<br/>Dynamic TimeEnable or disable System wake on alarm event. Select<br/>FixedTime, system will wake on the hr::min::sec<br/>specified. Select Dynamic Time, System will wake on<br/>the current time + Increase minute(s).

### 3.6.2.10 Serial Port Console Redirection

| Advanced  | Aptio Setup – AMI           |   |
|---|-----------------------------|---|
| COM1<br>Console Redirection<br>▶ Console Redirection Settings | (Disabled)                  | Console Redirection Enable or<br>Disable.   |
|   |                             | <pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre> |
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| Item                | Options                                | Description                              |
|---------------------|--|--|
| Console Redirection | Disabled<br>Enabled <b>[Default]</b> , | Console Redirection Enabled or Disabled. |

## 3.6.2.10.1 Console Redirection Settings

| Advanced  | Aptio Setup – AMI  |   |
|---|--|---|
| COM1<br>Console Redirection Settings<br>Terminal Type<br>Bits per second<br>Data Bits<br>Parity<br>Stop Bits<br>Flow Control<br>VT-UTF8 Combo Key Support<br>Recorder Mode<br>Resolution 100x31<br>Putty KeyPad | [ANSI]<br>[115200]<br>[8]<br>[None]<br>[1]<br>[None]<br>[Enabled]<br>[Disabled]<br>[Disabled]<br>[VT100] | Emulation: ANSI: Extended<br>ASCII char set. VT100: ASCII<br>char set. VT100Plus: Extends<br>VT100 to support color,<br>function keys, etc. VT-UTFB:<br>Uses UTF8 encoding to map<br>Unicode chars onto 1 or more<br>bytes.<br>++: Select Screen<br>14: Select Item<br>Enter: Select<br>+/-: Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F3: Optimized Defaults<br>F4: Save & Exit<br>ESC: Exit |
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| Item                         | Options   | Description  |
|------------------------------|---|--|
| Terminal Type                | VT100<br>VT100Plus<br>VT-UTF8<br>ANSI <b>[Default]</b> ,  | Emulation: ANSI: Extended ASCII char set VT100: ASCII<br>char set VT100Plus: Extends VT100 to support color,<br>function keys, etc. VT-UTF8: Uses UTF8<br>encoding to map Unicode chars onto 1 or more bytes.  |
| Bits per second              | 9600<br>19200<br>38400<br>57600<br>115200 <b>[Default]</b> ,  | Select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.  |
| Data Bits                    | 7<br>8 <b>[Default]</b> ,   | Data Bits  |
| Parity                       | None <b>[Default]</b> ,<br>Even<br>Odd<br>Mark<br>Space   | A parity bit can be sent with the data bits to detect some<br>transmission errors. Even: parity bit is 0 if the num of 1's<br>in the data bits is even. Odd: parity bit is 0 if num of 1's in<br>the data bits is odd. Mark parity bit is always 1. Space:<br>Parity bit is always 0. Mark and Space Parity do not allow<br>for error detection. |
| Stop Bits                    | 1 <b>[Default]</b> ,<br>2   | Stop bits indicate the end of a serial data packet. (A start<br>bit indicates the beginning). The standard setting is 1 stop<br>bit. Communication with slow devices may require more<br>than 1 stop bit   |
| Flow Control                 | Flow control can prevent data loss from buffer over<br>When sending data, if the receiving buffers are ful<br>'stop' signal can be sent to stop the data flow. One<br>buffers are empty, a 'start' signal can be sent to re<br>the flow. Hardware flow control uses two wires to<br>start/stop signals. |  |
| VT-UTF8 Combo Key<br>Support | Disabled<br>Enabled <b>[Default]</b> ,  | Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals  |
| Recorder Mode                | Disabled<br>Enabled <b>[Default]</b> ,  | With this mode enabled only text will be sent. This is to capture Terminal data.   |
| Resolution 100x31            | Disabled<br>Enabled <b>[Default]</b> ,  | Enables or disables extended terminal resolution   |
| Putty KeyPad                 | VT100 <b>[Default]</b> ,<br>LINUX<br>XTERMR6<br>SCO<br>ESCN<br>VT400  | Select FunctionKey and KeyPad on Putty.  |

## 3.6.2.11 Intel TXT Information

| Advanced  | Aptio Setup — AMI  |   |
|---|--|---|
| Intel TXT Information<br>Chipset<br>BiosAcm<br>Chipset Txt<br>Cpu Txt<br>Error Code<br>Class Code<br>Major Code<br>Minor Code | Production Fused<br>Debug Fused<br>Supported<br>None<br>None<br>None<br>None<br>None | <pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre> |
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## 3.6.2.12 USB Configuration

The USB Configuration menu helps read USB information and configures USB settings.

| Advanced  | Aptio Setup – AMI              |   |
|---|--------------------------------|---|
| USB Configuration   |                                | Enable/Disable USB Mass   |
| USB Module Version  | 28                             | storage univer support.   |
| USB Controllers:<br>1 XHCI<br>USB Devices:<br>1 Drive, 1 Keyboard,                | 2 Hubs                         |   |
| USB Mass Storage Driver Su<br>Mass Storage Devices:<br>KingstopDataTagualop 2,000 | oport [Enabled]<br>            | upport  |
| Kingstonbatan averer 3.01h  |                                | lect Screen<br>lect Item  |
|   |                                | Enter: Select<br>+/−: Change Opt.                                 |
|   |                                | F1: General Help<br>F2: Previous Values<br>F3: Ontimized Defaults |
|   |                                | F4: Save & Exit<br>ESC: Exit                                      |
|   |                                |   |
|   |                                |   |
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| Aptio Setup – AMI<br>Advanced  |   |
|--|---|
| USB Configuration  | Mass storage device emulation   |
| USB Module Version 28  | devices according to their<br>media format. Optical drives  |
| USB Controllers:<br>1 XHCI   | are emulated as 'CDROM',<br>drives with no media will be  |
| USB Devices:<br>1 Drive, 1 Keyboard, 2 Hubs  | emulated according to a drive type.   |
| USB Mass Storage Driver Sup<br>Mass Storage Devices:<br>KingstonDataTraveler 0.0PMA<br>Hard Disk<br>CD-ROM | Select Screen<br>Select Item<br>r: Select<br>Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F3: Optimized Defaults<br>F4: Save & Exit<br>ESC: Exit |
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| Item  | Options  | Description                                     |
|---|--|---|
| USB Mass Storage Driver<br>Support  | Disabled<br>Enabled <b>[Default]</b> ,   | Enable/Disable USB Mass Storage Driver Support. |
| Support     Enabled[Default],       Auto[Default]     Floppy       Mass Storage Devices     Forced FDD       Hard Disk     CD-ROM | Mass storage device emulation type. 'AUTO'<br>enumerates devices according to their media format.<br>Optical drives are emulated as 'CDROM', drives with<br>no media will be emulated according to a drive type. |   |

# 3.6.2.13 Network Stack Configuration

| Advanced  | Aptio Setup – AMI                               |   |
|---|---|---|
| Advanced<br>Network Stack<br>IPv4 PXE Support<br>IPv6 PXE Support<br>PXE boot wait time<br>Media detect count | [Enabled]<br>[Disabled]<br>[Disabled]<br>0<br>1 | Enable/Disable UEFI Network<br>Stack<br>++: Select Screen<br>11: Select Item<br>Enter: Select<br>+/-: Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F3: Optimized Defaults<br>F4: Save & Exit |
|   |   |   |
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| Item               | Options                                | Description  |
|--------------------|--|--|
| Network stack      | Disabled<br>Enabled <b>[Default]</b> , | Enable/Disable UEFI Network stack.   |
| Ipv4 PXE Support   | Disabled <b>[Default]</b> ,<br>Enabled | Enable/Disable Ipv4 PXE Boot Support. If disabled, IPV4 PXE boot support will not be available.            |
| Ipv6 PXE Support   | Disabled <b>[Default]</b> ,<br>Enabled | Enable/Disable Ipv6 PXE Boot Support. If disabled,<br>IPV6 PXE boot support will not be available.         |
| PXE boot wait time | 0                                      | Wait time in seconds to press ESC key to abort the PXE boot. Use either +/- or numeric keys set the value. |
| Media detect count | 1                                      | Number of time the presence of media will be checked.<br>Use either +/- or numeric keys set the value.     |

# 3.6.2.14 IP Configuration

| Advanced   | Aptio Setup – AMI   |   |
|--|---|---|
| IP Configuration Settings                        |   | Allows user to set IP.  |
| Provides the Options to Configure the IP Address |   | Every Boot -> If won't set<br>Every Boot -> Sets IP on every<br>boot  |
| Auto Configuration                               |   | IP using IPConfig interface   |
|  | Auto Configuration —<br>Disabled<br>Every Boot<br>On Demand | <pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre> |
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| Item               | Options  | Description                        |
|--------------------|--|------------------------------------|
| Auto Configuration | Disabled <b>[Default]</b> ,<br>Every Boot<br>On demand | Enable/Disable UEFI Network stack. |

### 3.6.2.15 NVMe Configuration



### 3.6.2.16 Remote Server Configuration



| ltem                          | Options                              | Description   |
|-------------------------------|--------------------------------------|---|
| Remote Firmware<br>Management | Disable<br>Enable <b>[Default]</b> , | Enable to communicate with management server. If Disabled then communication will not happen with management server |

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| Auto Server Searching | Disable<br>Enable <b>[Default]</b> ,  | Enable to Obtain DHCP Server IP automatically. Disable<br>to provide Server IP manually. Need to do Clear<br>Enrollment, if server is changed in DHCP |
|-----------------------|---|---|
| Server Port Number    | 8443  | Provide the Management server PORT number   |
| Server Address        | Management server Address to be used if Auto Server Searching is either disabled or failed. If changed, need to do Clear Enrollment, if already enrolled with previous IP |   |
| Clear Enrollment      | Clear existing Enrollment information   |   |

## 3.6.3 Chipset

| Aptio Setup – AMI<br>Main Advanced <mark>Chipset</mark> Security Boot Save & Exit     |  |
|---|--|
| <ul> <li>▶ System Agent (SA) Configuration</li> <li>▶ PCH-IO Configuration</li> </ul> | System Agent (SA) Parameters   |
|   | <pre>++: Select Screen 1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre> |
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## 3.6.3.1 System Agent (SA) Configuration

| Chipset   | Aptio Setup — AMI           |   |
|---|-----------------------------|---|
| System Agent (SA) Configuration   |                             | Memory Configuration Parameters   |
| VT-d  | Supported                   |   |
| Memory Configuration<br>Graphics Configuration<br>VMD setup menu<br>PCI Express Configuration |                             |   |
| VT-d  | [Enabled]                   |   |
|   |                             | <pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre> |
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| Item | Options                                | Description     |
|------|--|-----------------|
| VT-d | Disabled<br>Enabled <b>[Default]</b> , | VT-d capability |

### 3.6.3.1.1 Memory Configuration



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| Item      | Options  | Description  |
|-----------|--|--|
| Max TOLUD | Dynamic <b>[Default]</b> ,<br>1 GB<br>1.25 GB<br>1.5 GB<br>1.75 GB<br>2 GB<br>2.25 GB<br>2.5 GB<br>3 GB<br>3.25 GB<br>3.5 GB | Maximum Value of TOLUD, Dynamic assignment<br>would adjust TOLUD automatically based on largest<br>MMIO length of installed graphic controller |

# 3.6.3.1.2 Graphics Configuration



| ltem              | Options   | Description  |
|-------------------|---|--|
| Primary Display   | Auto <b>[Default]</b> ,<br>IGFX<br>PEG Slot<br>PCIE<br>HG | Select which of IGFX/PEG/PCIE Graphics device should be Primary Display Or select HG for Hybrid Gfx. |
| Internal Graphics | Auto <b>[Default]</b> ,<br>Disabled<br>Enabled            | Keep IGFX enabled based on the setup options.  |
| PSMI SUPPORT      | Disabled <b>[Default]</b> ,<br>Enabled                    | PSMI Enable/Disable  |

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| DVMT Pre-Allocated | 0M<br>32M<br>64M<br>96M<br>128M<br>160M<br>4M<br>8M<br>12M<br>16M<br>20M<br>24M<br>28M<br>32M/F7<br>36M<br>40M<br>44M<br>48M<br>52M<br>56M<br>60M <b>[Default]</b> , | Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device. |
|--------------------|--|--|
|--------------------|--|--|

## 3.6.3.1.3 VMD setup menu

| Chipset                                    | Aptio Setup — AMI                            |  |
|--|--|--|
| VMD Configuration<br>Enable VMD controller | [Disabled]                                   | Enable/Disable to VMD<br>controller  |
|  | Enable VMD controller<br>Disabled<br>Enabled | +: Select Screen<br>1: Select Item<br>Enter: Select<br>+/-: Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F3: Optimized Defaults<br>F4: Save & Exit<br>ESC: Exit |
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| ltem                   | Options                                | Description                      |
|------------------------|--|----------------------------------|
| Enabled VMD controller | Disabled <b>[Default]</b> ,<br>Enabled | Enable/Disable to VMD controller |

### 3.6.3.1.4 PCI Express Configuration



| ltem                            | Options                                | Description                                     |
|---------------------------------|--|---|
| Detect Non-Compliance<br>Device | Disabled <b>[Default]</b> ,<br>Enabled | Detect Non-Compliance PCI Express Device in PEG |

### 3.6.3.1.4.1 PCI Express Root Port 1

| Chipset                                       | Aptio Setup – AMI                 |   |
|---|-----------------------------------|---|
| PCI Express Root Port 1<br>ASPM<br>PCIe Speed | [Enabled]<br>[Disabled]<br>[Auto] | Control the PCI Express Root<br>Port.<br>++: Select Screen<br>11: Select Item<br>Enter: Select<br>+/-: Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F3: Optimized Defaults<br>F4: Save & Exit<br>ESC: Exit |
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| Item                    | Options   | Description   |
|-------------------------|---|---|
| PCI Express Root Port 1 | Disabled<br>Enabled <b>[Default]</b> ,                          | Control the PCI Express Root Port.  |
| ASPM                    | Disabled <b>[Default]</b> ,<br>L0s<br>L1<br>L0sL1               | Set the ASPM Level: Force L0s - Force all links to<br>L0s State AUTO - BIOS auto configure DISABLE -<br>Disables ASPM |
| PCle Speed              | Auto <b>[Default]</b> ,<br>Gen1<br>Gen2<br>Gen3<br>Gen4<br>Gen5 | Configure PCIe Speed  |

# 3.6.3.1.4.2 PCI Express Root Port 1

| PCI Express Root Port 1 [Enabled]<br>ASPM [Disabled]<br>PCIe Speed [Auto] | Control the PCI Express Root<br>Port.  |
|---|--|
|   |  |
|   | <pre>+: Select Screen 1↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre> |

| ltem                    | Options   | Description   |
|-------------------------|---|---|
| PCI Express Root Port 2 | Disabled<br>Enabled <b>[Default]</b> ,                          | Control the PCI Express Root Port.  |
| ASPM                    | Disabled <b>[Default]</b> ,<br>L0s<br>L1<br>L0sL1               | Set the ASPM Level: Force L0s - Force all links to<br>L0s State AUTO - BIOS auto configure DISABLE -<br>Disables ASPM |
| PCle Speed              | Auto <b>[Default]</b> ,<br>Gen1<br>Gen2<br>Gen3<br>Gen4<br>Gen5 | Configure PCIe Speed  |

## 3.6.3.2 PCH-IO Configuration

| Chipset  | Aptio Setup – AMI   |   |
|--|---|---|
| PCH-IO Configuration<br>► PCI Express Configuration<br>► SATA Configuration<br>► USB Configuration<br>► HD Audio Configuration<br>► SerialIo Configuration |   | PCI Express Configuration<br>settings   |
| LAN1 Controller<br>LAN1 PXE OpROM<br>LAN2 Controller<br>LAN2 PXE OpROM<br>Restore AC Power Loss<br>Flash Protection Range Registers<br>(FPRR)              | [Enabled]<br>[Disabled]<br>[Enabled]<br>[Disabled]<br>[Power Off]<br>[Disabled] | ++: Select Screen<br>11: Select Item<br>Eston: Solect   |
| GPIO Group Control<br>Amplifier GAIN(db)   | [Disabled]<br>[15.3db]  | +/-: Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F3: Optimized Defaults<br>F4: Save & Exit<br>ESC: Exit |
| Version  | 2.22.1284 Copyright (C) 202   | 2 AMI   |

| ltem                                       | Options   | Description  |
|--|---|--|
| LAN 1 Controller                           | Enabled <b>[Default]</b> ,<br>Disabled                  | Enable or disable onboard NIC.   |
| LAN1 PXE OpROM                             | Enabled <b>[Default]</b> ,<br>Disabled                  | Enable or disable boot option for LAN1 Controller.                                     |
| LAN 2 Controller                           | Disabled<br>Enabled <b>[Default]</b> ,                  | Control the PCI Express Root Port.   |
| LAN2 PXE OpROM                             | Enabled <b>[Default]</b> ,<br>Disabled                  | Enable or disable boot option for LAN2 Controller.                                     |
| Restore AC Power Loss                      | Power ON<br>Power Off<br>Last State <b>[Default]</b> ,  | Specify what state to go to when power is re-applied after a power failure (G3 state). |
| Flash Protection Range<br>Registers (FPRR) | Disabled<br>Enabled <b>[Default]</b> ,                  | Enable Flash Protection Range Registers  |
| GPIO Group Control                         | Enabled <b>[Default]</b> ,<br>Disabled                  | Configure the digital GPIO pins  |
| Amplifier GAIN(db)                         | 15.3dp <b>[Default]</b> ,<br>21.2dp<br>27.2dp<br>31.8dp | Select Amplifier value   |

### 3.6.3.2.1 PCH-IO Configuration

| Aptio Setup – AMI<br>Chipset   |   |
|--|---|
| PCI Express Configuration  | PCI Express Root Port Settings.   |
| <ul> <li>PCI Express Root Port 1(x4 Slot 3)</li> <li>PCI Express Root Port 5(x1 Slot 1)</li> <li>PCI Express Root Port 6(x1 Slot 5)</li> <li>PCI Express Root Port 7(x1 Slot 6)</li> <li>PCI Express Root Port 8(x1 Key E)</li> <li>PCI Express Root Port 9(LAN1)</li> <li>PCI Express Root Port 10(LAN2)</li> <li>PCI Express Root Port 13(x4 Key M)</li> <li>PCI Express Root Port 21(x4 Slot 4)</li> <li>PCI Express Root Port 25(x4 Slot 7)</li> </ul> | <pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Ontimized Defaults</pre> |
|  | F3: Uptimized Defaults<br>F4: Save & Exit<br>ESC: Exit  |
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## 3.6.3.2.1.1 PCI Express Root Port 1(x4 Slot 3)

| Chipset   | Aptio Setup – AMI                               |   |
|---|---|---|
| PCI Express Root Port 1<br>ASPM 1<br>PCIE Speed<br>Detect Non-Compliance Device | [Enabled]<br>[Disabled]<br>[Auto]<br>[Disabled] | Control the PCI Express Root<br>Port.<br>→: Select Screen<br>1: Select Item<br>Enter: Select<br>+/-: Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F3: Optimized Defaults<br>F4: Save & Exit<br>ESC: Exit |
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| ltem                                  | Options                                | Description                        |
|---------------------------------------|--|------------------------------------|
| PCI Express Root<br>Port 1(x4 Slot 3) | Disabled<br>Enabled <b>[Default]</b> , | Control the PCI Express Root Port. |

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| ASPM 1                          | Disabled <b>[Default]</b> ,<br>L1<br>Auto               | Set the ASPM Level: Force L0s - Force all links to<br>L0s State AUTO - BIOS auto configure DISABLE -<br>Disables ASPM |
|---------------------------------|---|---|
| PCIe Speed                      | Auto <b>[Default]</b> ,<br>Gen1<br>Gen2<br>Gen3<br>Gen4 | Configure PCIe Speed  |
| Detect Non-Compliance<br>Device | Disabled <b>[Default]</b> ,<br>Enabled                  | Detect Non-Compliance PCI Express Device. If enable, it will take more at POST time.                                  |

# 3.6.3.2.1.2 PCI Express Root Port 5(x1 Slot 1)

| Chipset   | nprio Setup - nMi                               |   |
|---|---|---|
| PCI Express Root Port 5<br>ASPM 5<br>PCIe Speed<br>Detect Non-Compliance Device | [Enabled]<br>[Disabled]<br>[Auto]<br>[Disabled] | Control the PCI Express Root<br>Port.   |
|   |   | <pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre> |

| Item                                  | Options   | Description   |
|---------------------------------------|---|---|
| PCI Express Root<br>Port 5(x1 Slot 1) | Disabled<br>Enabled <b>[Default]</b> ,                  | Control the PCI Express Root Port.  |
| ASPM 5                                | Disabled <b>[Default]</b> ,<br>L1<br>Auto               | Set the ASPM Level: Force L0s - Force all links to<br>L0s State AUTO - BIOS auto configure DISABLE -<br>Disables ASPM |
| PCle Speed                            | Auto <b>[Default]</b> ,<br>Gen1<br>Gen2<br>Gen3<br>Gen4 | Configure PCIe Speed  |
| Detect Non-Compliance<br>Device       | Disabled <b>[Default]</b> ,<br>Enabled                  | Detect Non-Compliance PCI Express Device. If enable, it will take more at POST time.                                  |

# 3.6.3.2.1.3 PCI Express Root Port 6(x1 Slot 5)

| trol the PCI Express Root<br>t.   |
|---|
| Select Screen<br>Select Item<br>er: Select<br>: Change Opt.<br>General Help<br>Previous Values<br>Optimized Defaults<br>Save & Exit<br>: Exit |
| P<br>O<br>S<br>:  |

| Item                                  | Options   | Description   |
|---------------------------------------|---|---|
| PCI Express Root<br>Port 6(x1 Slot 5) | Disabled<br>Enabled <b>[Default]</b> ,                  | Control the PCI Express Root Port.  |
| ASPM 6                                | Disabled <b>[Default]</b> ,<br>L1<br>Auto               | Set the ASPM Level: Force L0s - Force all links to<br>L0s State AUTO - BIOS auto configure DISABLE -<br>Disables ASPM |
| PCle Speed                            | Auto <b>[Default]</b> ,<br>Gen1<br>Gen2<br>Gen3<br>Gen4 | Configure PCIe Speed  |
| Detect Non-Compliance<br>Device       | Disabled <b>[Default]</b> ,<br>Enabled                  | Detect Non-Compliance PCI Express Device. If enable, it will take more at POST time.                                  |

## 3.6.3.2.1.4 PCI Express Root Port 7(x1 Slot 6)

| Chipset   | Aptio Setup – AMI                               |   |
|---|---|---|
| PCI Express Root Port 7<br>ASPM 7<br>PCIE Speed<br>Detect Non-Compliance Device | [Enabled]<br>[Disabled]<br>[Auto]<br>[Disabled] | Control the PCI Express Root<br>Port.   |
|   |   | <pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre> |
| Version   | 2 22 1284 Convright (C) 2022                    | AMT   |

| ltem                                  | Options   | Description   |
|---------------------------------------|---|---|
| PCI Express Root<br>Port 7(x1 Slot 6) | Disabled<br>Enabled <b>[Default]</b> ,                  | Control the PCI Express Root Port.  |
| ASPM 7                                | Disabled <b>[Default]</b> ,<br>L1<br>Auto               | Set the ASPM Level: Force L0s - Force all links to<br>L0s State AUTO - BIOS auto configure DISABLE -<br>Disables ASPM |
| PCle Speed                            | Auto <b>[Default]</b> ,<br>Gen1<br>Gen2<br>Gen3<br>Gen4 | Configure PCIe Speed  |
| Detect Non-Compliance<br>Device       | Disabled <b>[Default]</b> ,<br>Enabled                  | Detect Non-Compliance PCI Express Device. If enable, it will take more at POST time.                                  |

# 3.6.3.2.1.5 PCI Express Root Port 8(x1 Key E)

| Chipset  | Aptio Setup – AMI                               |   |
|--|---|---|
| Chipset<br>PCI Express Root Port 7<br>ASPM 7<br>PCIe Speed<br>Detect Non-Compliance Device | [Enabled]<br>[Disabled]<br>[Auto]<br>[Disabled] | Control the PCI Express Root<br>Port.<br>++: Select Screen<br>11: Select Item<br>Enter: Select<br>+/-: Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F3: Optimized Defaults<br>F4: Save & Exit<br>ESC: Exit |
|  |   |   |
| Versio   | n 2 22 1284 Conuright (C) 202                   | 2 AMT   |

| Item                                 | Options   | Description   |
|--------------------------------------|---|---|
| PCI Express Root<br>Port 8(x1 Key E) | Disabled<br>Enabled <b>[Default]</b> ,                  | Control the PCI Express Root Port.  |
| ASPM 8                               | Disabled <b>[Default]</b> ,<br>L1<br>Auto               | Set the ASPM Level: Force L0s - Force all links to<br>L0s State AUTO - BIOS auto configure DISABLE -<br>Disables ASPM |
| PCle Speed                           | Auto <b>[Default]</b> ,<br>Gen1<br>Gen2<br>Gen3<br>Gen4 | Configure PCIe Speed  |
| Detect Non-Compliance<br>Device      | Disabled <b>[Default]</b> ,<br>Enabled                  | Detect Non-Compliance PCI Express Device. If enable, it will take more at POST time.                                  |

# 3.6.3.2.1.6 PCI Express Root Port 13(x4 Key M)

| Chipset   | Aptio Setup – AMI                               |   |
|---|---|---|
| PCI Express Root Port 13<br>ASPM 13<br>PCIe Speed<br>Detect Non-Compliance Device | [Enabled]<br>[Disabled]<br>[Auto]<br>[Disabled] | Control the PCI Express Root<br>Port.<br>++: Select Screen<br>14: Select Item<br>Enter: Select<br>+/-: Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F3: Optimized Defaults<br>F4: Save & Exit<br>ESC: Exit |
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| Item                                  | Options   | Description   |
|---------------------------------------|---|---|
| PCI Express Root<br>Port 13(x4 Key M) | Disabled<br>Enabled <b>[Default]</b> ,                  | Control the PCI Express Root Port.  |
| ASPM 13                               | Disabled <b>[Default]</b> ,<br>L1<br>Auto               | Set the ASPM Level: Force L0s - Force all links to<br>L0s State AUTO - BIOS auto configure DISABLE -<br>Disables ASPM |
| PCle Speed                            | Auto <b>[Default]</b> ,<br>Gen1<br>Gen2<br>Gen3<br>Gen4 | Configure PCIe Speed  |
| Detect Non-Compliance<br>Device       | Disabled <b>[Default]</b> ,<br>Enabled                  | Detect Non-Compliance PCI Express Device. If enable, it will take more at POST time.                                  |

# 3.6.3.2.1.7 PCI Express Root Port 21(x4 Slot 4)

| Chipset   | Aptio Setup — AMI                               |   |
|---|---|---|
| PCI Express Root Port 21<br>ASPM 21<br>PCIE Speed<br>Detect Non-Compliance Device | [Enabled]<br>[Disabled]<br>[Auto]<br>[Disabled] | Control the PCI Express Root<br>Port.<br>++: Select Screen<br>fl: Select Item<br>Enter: Select<br>+/-: Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F3: Optimized Defaults<br>F4: Save & Exit<br>ESC: Exit |
| Versio  | n 2 22 1284 Conuright (C) 202                   | 2 AMT   |

| Item                                   | Options   | Description   |
|--|---|---|
| PCI Express Root<br>Port 21(x4 Slot 4) | Disabled<br>Enabled <b>[Default]</b> ,                  | Control the PCI Express Root Port.  |
| ASPM 21                                | Disabled <b>[Default]</b> ,<br>L1<br>Auto               | Set the ASPM Level: Force L0s - Force all links to<br>L0s State AUTO - BIOS auto configure DISABLE -<br>Disables ASPM |
| PCle Speed                             | Auto <b>[Default]</b> ,<br>Gen1<br>Gen2<br>Gen3<br>Gen4 | Configure PCIe Speed  |
| Detect Non-Compliance<br>Device        | Disabled <b>[Default]</b> ,<br>Enabled                  | Detect Non-Compliance PCI Express Device. If enable, it will take more at POST time.                                  |

# 3.6.3.2.1.8 PCI Express Root Port 25(x4 Slot 7)

| Chipset   | Aptio Setup – AMI                               |   |
|---|---|---|
| PCI Express Root Port 25<br>ASPM 25<br>PCIE Speed<br>Detect Non-Compliance Device | [Enabled]<br>[Disabled]<br>[Auto]<br>[Disabled] | Control the PCI Express Root<br>Port.   |
|   |   | <pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre> |

| Item                                   | Options   | Description   |
|--|---|---|
| PCI Express Root<br>Port 25(x4 Slot 7) | Disabled<br>Enabled <b>[Default]</b> ,                  | Control the PCI Express Root Port.  |
| ASPM 25                                | Disabled <b>[Default]</b> ,<br>L1<br>Auto               | Set the ASPM Level: Force L0s - Force all links to<br>L0s State AUTO - BIOS auto configure DISABLE -<br>Disables ASPM |
| PCle Speed                             | Auto <b>[Default]</b> ,<br>Gen1<br>Gen2<br>Gen3<br>Gen4 | Configure PCIe Speed  |
| Detect Non-Compliance<br>Device        | Disabled <b>[Default]</b> ,<br>Enabled                  | Detect Non-Compliance PCI Express Device. If enable, it will take more at POST time.                                  |

### 3.6.3.2.2 SATA Configuration

| Chipset  | Aptio Setup – AM]             | I  |
|--|-------------------------------|--|
| SATA Configuration                               |                               | Enable/Disable SATA Device.  |
| SATA Controller(s)<br>SATA Mode Selection        | [Enabled]<br>[AHCI]           |  |
| M.2 KeyM<br>Software Preserve<br>M2 Port         | Empty<br>Unknown<br>[Enabled] |  |
| Serial ATA Port 1<br>Software Preserve<br>Port 1 | Empty<br>Unknown<br>[Enabled] |  |
| Serial ATA Port 2<br>Software Preserve<br>Port 2 | Empty<br>Unknown<br>[Enabled] | ++: Select Screen<br>14: Select Item<br>Enter: Select<br>+/-: Change Opt.            |
| Serial ATA Port 3<br>Software Preserve<br>Port 3 | Empty<br>Unknown<br>[Enabled] | F1: General Help<br>F2: Previous Values<br>F3: Optimized Defaults<br>F4: Save & Exit |
| Serial ATA Port 4<br>Software Preserve<br>Port 4 | Empty<br>Unknown<br>[Enabled] | ESC: Exit  |
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| Item                | Options                                | Description                                |
|---------------------|--|--|
| SATA Controller(s)  | Enabled <b>[Default]</b> ,<br>Disabled | Enable/Disable SATA Device.                |
| SATA Mode Selection | AHCI                                   | Determines how SATA Controller(s) operate. |
| M2 Port             | Disabled<br>Enabled <b>[Default]</b> , | Enable or Disable SATA Port                |
| Port 1              | Disabled<br>Enabled <b>[Default]</b> , | Enable or Disable SATA Port                |
| Port 2              | Disabled<br>Enabled <b>[Default]</b> , | Enable or Disable SATA Port                |
| Port 3              | Disabled<br>Enabled <b>[Default]</b> , | Enable or Disable SATA Port                |
| Port 4              | Disabled<br>Enabled <b>[Default]</b> , | Enable or Disable SATA Port                |

## 3.6.3.2.3 USB Configuration

| Chipset  | Aptio Setup — AMI  |   |
|--|--|---|
| USB Configuration  |  | Enable/Disable USB Standby<br>Power.  |
| USB12 Standby Power<br>USB34 Standby Power<br>USB56 Standby Power<br>USB89 Standby Power<br>USB1011 Standby Power<br>USB1213 Standby Power<br>USB1415 Standby Power<br>USB1617 Standby Power | [Enabled]<br>[Enabled]<br>[Enabled]<br>[Enabled]<br>[Enabled]<br>[Enabled]<br>[Enabled]<br>[Enabled] |   |
|  |  | <pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre> |
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| Item                     | Options                                | Description                      |
|--------------------------|--|----------------------------------|
| USB12 Standby Power      | Disabled<br>Enabled <b>[Default]</b> , | Enable/Disable USB Standby Power |
| USB34 Standby Power      | Disabled<br>Enabled <b>[Default]</b> , | Enable/Disable USB Standby Power |
| USB56 Standby Power      | Disabled<br>Enabled <b>[Default]</b> , | Enable/Disable USB Standby Power |
| USB89 Standby Power      | Disabled<br>Enabled <b>[Default]</b> , | Enable/Disable USB Standby Power |
| USB1011 Standby<br>Power | Disabled<br>Enabled <b>[Default]</b> , | Enable/Disable USB Standby Power |
| USB1213 Standby<br>Power | Disabled<br>Enabled <b>[Default]</b> , | Enable/Disable USB Standby Power |
| USB1415 Standby<br>Power | Disabled<br>Enabled <b>[Default]</b> , | Enable/Disable USB Standby Power |
| USB1617 Standby<br>Power | Disabled<br>Enabled <b>[Default]</b> , | Enable/Disable USB Standby Power |

### 3.6.3.2.4 HD Audio Configuration

| Chipset                              | Aptio Setup — AMI               |   |
|--------------------------------------|---------------------------------|---|
| HD Audio Subsystem Configuration Set | tings<br>[Enabled]              | Control Detection of the<br>HD-Audio device.<br>Disabled = HDA will be<br>unconditionally disabled<br>Enabled = HDA will be<br>unconditionally enabled.               |
|                                      | HD Audio<br>Disabled<br>Enabled | <pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre> |
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| Item     | Options                                | Description   |
|----------|--|---|
| HD Audio | Disabled<br>Enabled <b>[Default]</b> , | Control Detection of HD-Audio device.<br>Disabled = HDA will be unconditionally disabled<br>Enabled = HDA will be unconditionally enabled |

# 3.6.3.2.5 Seriallo Configuration

| Chipset  | Aptio Setup — AMI                 |   |
|--|-----------------------------------|---|
| SerialIo Configuration<br>I2CO Controller<br>I2C2 Controller<br>Serial IO I2CO Settings<br>Serial IO I2C2 Settings | [Enabled]<br>[Enabled]            | Enables/Disables SerialIo<br>Controller<br>If given device is Function O<br>PSF disabling is skipped. PSF<br>default will remain and device<br>PCI CFG Space will still be<br>visible. This is needed to<br>allow PCI enumerator access<br>functions above O in a<br>multifunction device.<br>The following devices depend<br>+: Select Screen<br>11: Select Item<br>Enter: Select<br>+/-: Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F3: Optimized Defaults<br>F4: Save & Exit<br>ESC: Exit |
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| ltem            | Options  | Description   |
|-----------------|--|---|
| I2C0 Controller | Disabled<br>Enabled <b>[Default]</b> ,<br>Post Code Only | Enables/Disables Seriallo Controller If given device is<br>Function 0 PSF disabling is skipped. PSF default will<br>remain and device PCI CFG Space will still be visible.<br>This is needed to allow PCI enumerator access<br>functions above 0 in a multifunction device. The<br>following devices depend on each other: 12C0 |

# 3.6.4 Security

| Aptio Setup – AMI<br>Main Advanced Chipset <mark>Security </mark> Boot Save & Exit   |   |  |
|--|---|--|
| Password Description<br>If ONLY the Administrator's pass<br>then this only limits access to<br>only asked for when entering Set<br>If ONLY the User's password and must<br>boot or enter Setup. In Setup th<br>have Administrator rights.<br>The password length must be<br>in the following range:<br>Minimum length<br>Maximum length<br>Administrator Password<br>User Password | word is set,<br>Setup and is<br>up.<br>et, then this<br>se entered to<br>e User will<br>3<br>20 | <pre>Set Administrator Password ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre> |
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| Item                      | Description                |  |
|---------------------------|----------------------------|--|
| Administrator<br>Password | Set Administrator Password |  |
| User Password             | Set User Password          |  |
#### 3.6.5 Boot



| Item                 | Options   | Description   |
|----------------------|---|---|
| Setup Prompt Timeout | 1   | Number of seconds to wait for setup activation key.<br>65535(0xFFFF) means indefinit waiting. |
| Bootup NumLock State | On <b>[Default]</b> ,<br>Off  | Select the keyboard NumLock state   |
| Quiet Boot           | Disabled<br>Enabled <b>[Default]</b> ,  | Enables or disables Quiet Boot option   |
| Boot mode select     | LEGACY<br>UEFI <b>[Default]</b> ,   | Select boot mode LEGACY/UEFI  |
| Boot Option #1       | USB Key, CD/DVD, USB<br>CD/DVD, USB Hard Disk,<br>USB Floppy, NVME,<br>Hard Disk <b>[Default]</b> , Network,<br>UEFI AP, Disabled | Sets the system boot order  |
| Boot Option #2       | USB Key, CD/DVD <b>[Default]</b> ,<br>USB CD/DVD,<br>USB Hard Disk, USB Floppy,<br>NVME, Hard Disk, Network,<br>UEFI AP, Disabled | Sets the system boot order  |

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| Boot Option #3 | USB Key, CD/DVD,<br>USB CD/DVD <b>[Default]</b> ,<br>USB Hard Disk, USB Floppy,<br>NVME, Hard Disk, Network,<br>UEFI AP, Disabled    | Sets the system boot order |
|----------------|--|----------------------------|
| Boot Option #4 | USB Key, CD/DVD,<br>USB CD/DVD,<br>USB Hard Disk,<br>USB Floppy <b>[Default]</b> ,<br>NVME, Hard Disk, Network,<br>UEFI AP, Disabled | Sets the system boot order |
| Boot Option #5 | USB Key, CD/DVD, USB<br>CD/DVD, USB Hard Disk,<br>USB Floppy, NVME <b>[Default]</b> ,<br>Hard Disk, Network, UEFI<br>AP, Disabled    | Sets the system boot order |
| Boot Option #6 | USB Key <b>[Default]</b> ,<br>CD/DVD, USB CD/DVD,<br>USB Hard Disk, USB Floppy,<br>NVME, Hard Disk, Network,<br>UEFI AP, Disabled    | Sets the system boot order |
| Boot Option #7 | USB Key, CD/DVD,<br>USB CD/DVD,<br>USB Hard Disk, USB Floppy,<br>NVME, Hard Disk,<br>Network <b>[Default]</b> , UEFI AP,<br>Disabled | Sets the system boot order |
| Boot Option #8 | USB Key, CD/DVD,<br>USB CD/DVD,<br>USB Hard Disk, USB Floppy,<br>NVME, Hard Disk, Network,<br>UEFI AP <b>[Default]</b> , Disabled    | Sets the system boot order |

#### 3.6.6 Save & Exit



## 3.6.6.1 Save Changes and Exit

Exit system setup after saving the changes.

#### 3.6.6.2 Discard Changes and Exit

Exit system setup without saving the changes.

#### 3.6.6.3 Save Changes and Reset

Reset the system after saving the changes.

#### 3.6.6.4 Restore Defaults

Restore/Load default values for all the setup option.

#### 3.6.6.5 Launch EFI Shell from filesystem device

Attempts to launch EFI shell application from one of the available filesystem devices.

#### 3.6.6.6 AMIFWUpdate

Launches AMIFWUpdate.



# 4.1 Install Chipset Driver

All drivers can be found on the Avalue Official Website:

http://www.avalue.com.tw.



**Note:** The installation procedures and screen shots in this section are based on Windows 10 operation system. If the warning message appears while the installation process, click Continue to go on.





#### Step1. Click Next.





## Step 3. Click Install.



Step 4. Complete setup.

# 4.2 Install VGA Driver

All drivers can be found on the Avalue Official Website:

http://www.avalue.com.tw.





Step 1. Click Begin installation.







Step 2. Click I agree.



Step 4. Click Finish to complete setup.

# 4.3 Install ME Driver

All drivers can be found on the Avalue Official Website:

http://www.avalue.com.tw.





Step 1. Click Next to continue setup.



Step 2. Click Next.



Step 3. Click Next



Step 4. Click Finish to complete the setup

# 4.4 Install Audio Driver (For Realtek ALC888S HD Audio)

All drivers can be found on the Avalue Official Website:

http://www.avalue.com.tw.





Step 1. Click Next to Install.



**Step 2.** Select **Finish** to complete Installation.

# 4.5 Install LAN Driver

All drivers can be found on the Avalue Official Website:

http://www.avalue.com.tw.











# 4.6 Install Serial IO Driver

All drivers can be found on the Avalue Official Website:

http://www.avalue.com.tw.



**Note:** The installation procedures and screen shots in this section are based on Windows 10 operation system.

| Setup   |                            | ×   |
|---|----------------------------|-----|
| ntel® Serial IO<br>Welcome  | (in                        | tel |
| You are about to install the following product:   |                            |     |
| Intel® Serial IO 30.100.2221.20   |                            |     |
| It is strongly recommended that you exit all programs bet<br>Click Next to continue, or click Cancel to exit the setup pr | fore continuing.<br>ogram. |     |
|   |                            |     |

Step 1. Click Next to continue installation.



Step 2. Click Next.



#### Step 3. Click Next.



#### Step 4. Click Next.



Step 5. Click Finish to complete setup.

# 4.7 Install Intel\_DTT

All drivers can be found on the Avalue Official Website:

http://www.avalue.com.tw.



|  | rechnology                               |                    | intal           |
|--|--|--------------------|-----------------|
| Welcome to the Setup Pro   | ogram                                    |                    | inter           |
| This setup program will install the follow   | ing components:                          |                    |                 |
| Intel(R) Dynamic Tuning Technology I   | installer                                |                    |                 |
| <ul> <li>Intel(R) Dynamic Tuning Technology I<br/>It is strongly recommended that you ex</li> </ul>      | installer<br>iit all programs before con | tinuing. Click Nex | t to continue.  |
| <ul> <li>Intel(R) Dynamic Tuning Technology I</li> <li>It is strongly recommended that you ex</li> </ul> | installer<br>rit all programs before con | tinuing. Click Nex | t to continue.  |
| Intel(R) Dynamic Tuning Technology 1     It is strongly recommended that you ex                          | installer                                | tinuing. Click Nex | t to continue.  |
| Intel(R) Dynamic Tuning Technology I     It is strongly recommended that you ex                          | installer                                | tinuing. Click Nex | it to continue. |

Step 1. Click Next to continue installation.



Step 2. Click Next.



Step 3. Click Next.



Step 4. Click Finish to complete setup.

# 4.8 Install GNA

All drivers can be found on the Avalue Official Website:

http://www.avalue.com.tw.



**Note:** The installation procedures and screen shots in this section are based on Windows 10 operation system.

|   |   | ×      |
|---|---|--------|
| - | Update Drivers - Base System Device   |        |
|   | How do you want to search for drivers?  |        |
|   | → Search automatically for drivers  |        |
|   | windows will search your computer for the best available driver and install it on<br>your device. |        |
|   | → Browse my computer for drivers  |        |
|   | Locate and install a driver manually.   |        |
|   |   |        |
|   |   |        |
|   |   | Cancel |

Step 1. Click Browse my computer for drivers.

| Update Drivers - Base System Device   |
|---|
| Browse for drivers on your computer   |
| Search for drivers in this location:  |
| C:\Users\WC680R\Desktop\BC680R\BC680R_71832_GNA-03.00.00.1 $\vee$ Browse  |
|   |
| → Let me pick from a list of available drivers on my computer<br>This list will show available drivers compatible with the device, and all drivers in the<br>same category as the device. |
|   |

Step 2. Click Next to continue installation.

| 8 |  | ×     |
|---|--|-------|
| 4 | Update Drivers - Intel(R) GNA Scoring Accelerator module     |       |
|   | Windows has successfully updated your drivers                |       |
|   | Windows has finished installing the drivers for this device: |       |
|   | Intel(R) GNA Scoring Accelerator module                      |       |
|   |  |       |
|   |  |       |
|   |  |       |
|   |  |       |
|   |  |       |
|   |  |       |
|   |  | Close |

Step 3. Click Finish to complete setup.

**User's Manual** 

# 5. Mechanical Drawing



# 5.1 Mechanical Drawing





Unit: mm

