

GA-F2A78M-DASHV

User's Manual

Rev. 1001

12ME-F278MDV-1001R



For more product details, please visit GIGABYTE's website.



To reduce the impacts on global warming, the packaging materials of this product are recyclable and reusable. GIGABYTE works with you to protect the environment.

Declaration of Conformity

We, Manufacturer/Importer,

G.B.T. Technology Trading GmbH

Address: **Bu**enkoppel 16, 22047 Hamburg, Germany

Declare that the product

Product Type: **Motherboard**

Product Name: **GA-F2A78M-DASHV**

conforms with the essential requirements of the following directives:

EMC Directive 2004/108/EC (until 2016/04/19), 2014/30/EU (after 2016/04/20):

- | | |
|--|---------------------------|
| <input checked="" type="checkbox"/> Conduction & Radiated Emissions: | EN 55022:2010/AC2011 |
| <input checked="" type="checkbox"/> Immunity: | EN 55024:2010 |
| <input checked="" type="checkbox"/> Power-line harmonics: | EN 61000-3-2:2006+A2:2009 |
| <input checked="" type="checkbox"/> Power-line flicker: | EN 61000-3-3:2013 |

Low Voltage Directive 2006/95/EC (until 2016/04/19), 2014/35/EU (after 2016/04/20):

- | | |
|---|--|
| <input checked="" type="checkbox"/> Safety: | EN60950-1:2006+A11:2009+A12:2011+A2:2013 |
|---|--|

RoHS Directive 2011/65/EU

- | | |
|---|--|
| <input checked="" type="checkbox"/> Restriction of use of certain substances in electronic equipment: | This product does not contain any of the restricted substances listed in Annex II, in concentrations and applications banned by the directive. |
|---|--|

CE marking



Signature: Timmy Huang

(stamp)

Date: Jun. 24, 2016

Name: Timmy Huang

DECLARATION OF CONFORMITY

Per FCC Part 2 Section 2.1077(a)



Responsible Party Name: **G.B.T. INC. (U.S.A.)**

Address: **17358 Railroad Street
City of Industry, CA 91748**

Phone/Fax No: **(626) 854-9338/ (626) 854-9326**

hereby declares that the product

Product Name: Motherboard

Model Number: GA-F2A78M-DASHV

Conforms to the following specifications:

FCC Part 15, Subpart B, Section 15.107(a) and Section 15.109 (a), Class B Digital Device

Supplementary Information:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful and (2) this device must accept any interference received, including that may cause undesired operation.

Representative Person's Name: ERIC LU

Signature: Eric Lu

Date: Jun. 24, 2016

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- For quick set-up of the product, read the Quick Installation Guide included with the product.
- In order to assist in the use of this product, carefully read the User's Manual.
- For product-related information, check on our website at: <http://www.gigabyte.com>

Identifying Your Motherboard Revision

The revision number on your motherboard looks like this: "REV: X.X." For example, "REV: 1.0" means the revision of the motherboard is 1.0. Check your motherboard revision before updating motherboard BIOS, drivers, or when looking for technical information.

Example:

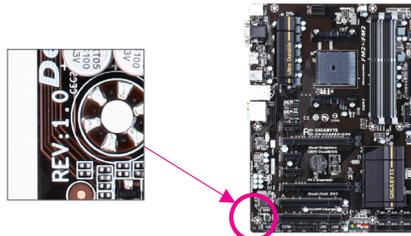
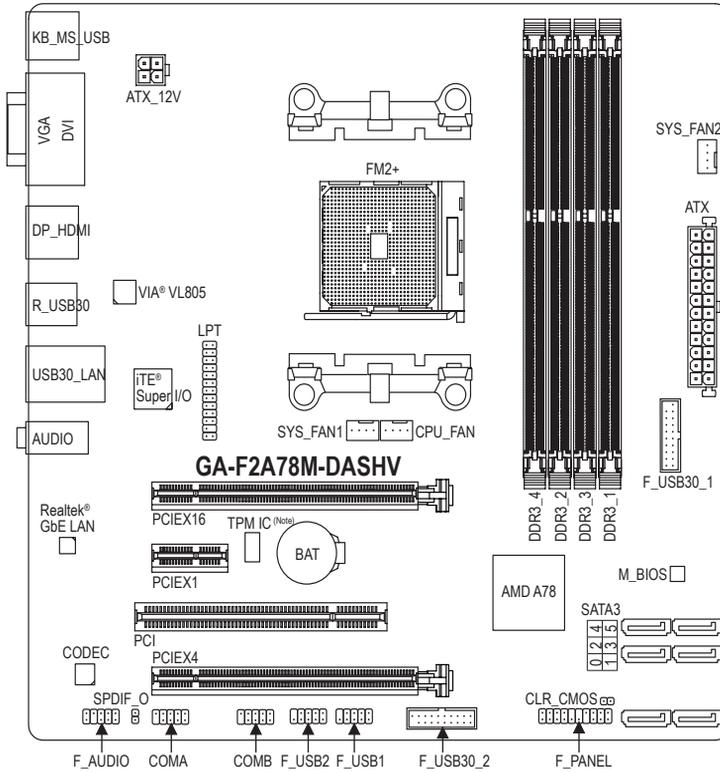


Table of Contents

GA-F2A78M-DASHV Motherboard Layout.....	4
Chapter 1 Hardware Installation	5
1-1 Installation Precautions.....	5
1-2 Product Specifications.....	6
1-3 Installing the APU.....	9
1-4 Installing the Memory.....	9
1-5 Installing an Expansion Card	10
1-6 Setup of the AMD Dual Graphics Configuration.....	10
1-7 Back Panel Connectors.....	11
1-8 Internal Connectors.....	13
Chapter 2 BIOS Setup	18
2-1 Startup Screen	19
2-2 M.I.T.	19
2-3 System Information	23
2-4 BIOS Features	24
2-5 Peripherals	27
2-6 Power Management.....	29
2-7 Save & Exit.....	31
Chapter 3 Appendix.....	32
3-1 Configuring a RAID Set.....	32
3-2 Drivers Installation.....	34
Regulatory Statements.....	35
Contact Us	40

GA-F2A78M-DASHV Motherboard Layout



Box Contents

- GA-F2A78M-DASHV motherboard
- Motherboard driver disk
- User's Manual
- Quick Installation Guide
- Four SATA cables
- I/O Shield

* The box contents above are for reference only and the actual items shall depend on the product package you obtain. The box contents are subject to change without notice.

(Note) Whether this feature is supported depends on the product being received.

Chapter 1 Hardware Installation

1-1 Installation Precautions

The motherboard contains numerous delicate electronic circuits and components which can become damaged as a result of electrostatic discharge (ESD). Prior to installation, carefully read the user's manual and follow these procedures:

- Prior to installation, make sure the chassis is suitable for the motherboard.
- Prior to installation, do not remove or break motherboard S/N (Serial Number) sticker or warranty sticker provided by your dealer. These stickers are required for warranty validation.
- Always remove the AC power by unplugging the power cord from the power outlet before installing or removing the motherboard or other hardware components.
- When connecting hardware components to the internal connectors on the motherboard, make sure they are connected tightly and securely.
- When handling the motherboard, avoid touching any metal leads or connectors.
- It is best to wear an electrostatic discharge (ESD) wrist strap when handling electronic components such as a motherboard, CPU or memory. If you do not have an ESD wrist strap, keep your hands dry and first touch a metal object to eliminate static electricity.
- Prior to installing the motherboard, please have it on top of an antistatic pad or within an electrostatic shielding container.
- Before connecting or unplugging the power supply cable from the motherboard, make sure the power supply has been turned off.
- Before turning on the power, make sure the power supply voltage has been set according to the local voltage standard.
- Before using the product, please verify that all cables and power connectors of your hardware components are connected.
- To prevent damage to the motherboard, do not allow screws to come in contact with the motherboard circuit or its components.
- Make sure there are no leftover screws or metal components placed on the motherboard or within the computer casing.
- Do not place the computer system on an uneven surface.
- Do not place the computer system in a high-temperature or wet environment.
- Turning on the computer power during the installation process can lead to damage to system components as well as physical harm to the user.
- If you are uncertain about any installation steps or have a problem related to the use of the product, please consult a certified computer technician.
- If you use an adapter, extension power cable, or power strip, ensure to consult with its installation and/or grounding instructions.

1-2 Product Specifications

	APU	<ul style="list-style-type: none"> ◆ FM2+ Socket: <ul style="list-style-type: none"> - AMD A series processors - AMD Athlon™ series processors <p>(Go to GIGABYTE's website for the latest CPU support list.)</p>
	Chipset	<ul style="list-style-type: none"> ◆ AMD A78
	Memory	<ul style="list-style-type: none"> ◆ 4 x DDR3 DIMM sockets supporting up to 64 GB of system memory <ul style="list-style-type: none"> * Due to a Windows 32-bit operating system limitation, when more than 4 GB of physical memory is installed, the actual memory size displayed will be less than the size of the physical memory installed. * The maximum 64 GB of system memory can be supported using 16 GB (or above) memory modules. GIGABYTE will update the memory support list on the official website when the memory modules are available on the market. ◆ Dual channel memory architecture ◆ Support for DDR3 2133/1866/1600/1333 MHz memory modules ◆ Support for AMD Memory Profile (AMP)/Extreme Memory Profile (XMP) memory modules <p>(Go to GIGABYTE's website for the latest supported memory speeds and memory modules.)</p>
	Onboard Graphics	<ul style="list-style-type: none"> ◆ Integrated Graphics Processor: <ul style="list-style-type: none"> - 1 x D-Sub port, supporting a maximum resolution of 1920x1200 - 1 x DVI-D port, supporting a maximum resolution of 2560x1600 <ul style="list-style-type: none"> * Support for 2560x1600 resolution requires both a monitor and cable that support Dual Link DVI. * The DVI-D port does not support D-Sub connection by adapter. - 1 x HDMI port, supporting a maximum resolution of 4096x2160 <ul style="list-style-type: none"> * The resolution of 4096x2160 can be supported when using an FM2+ APU; the maximum resolution supported is 1920x1200 when using an FM2 APU. * Support for HDMI 1.4a version. - 1 x DisplayPort, supporting a maximum resolution of 3840x2160 <ul style="list-style-type: none"> * The DisplayPort does not support Hot plug. If you want to change to another graphics port when the computer is on, be sure to turn off the computer first. * Support for DisplayPort 1.2 version. - Maximum shared memory of 2 GB
	Audio	<ul style="list-style-type: none"> ◆ Realtek® ALC887 codec ◆ High Definition Audio ◆ 2/4/5.1/7.1-channel <ul style="list-style-type: none"> * To configure 7.1-channel audio, you have to use an HD front panel audio module and enable the multi-channel audio feature through the audio driver. ◆ Support for S/PDIF Out
	LAN	<ul style="list-style-type: none"> ◆ Realtek® GbE LAN chip (10/100/1000 Mbit)
	TPM	<ul style="list-style-type: none"> ◆ Infineon chip, supporting TPM 2.0
	Expansion Slots	<ul style="list-style-type: none"> ◆ 1 x PCI Express x16 slot, running at x16 (PCIEX16) (The PCI Express x16 slot conforms to PCI Express 3.0 standard.) <ul style="list-style-type: none"> * To support PCI Express 3.0, you must install an FM2+ APU. ◆ 1 x PCI Express x16 slot, running at x4 (PCIEX4) ◆ 1 x PCI Express x1 slot (The PCIEX4 and PCIEX1 slots conform to PCI Express 2.0 standard.) ◆ 1 x PCI slot

	Multi-Graphics Technology	<ul style="list-style-type: none"> ◆ Support for AMD Dual Graphics technology <ul style="list-style-type: none"> * Only A series APUs support AMD Dual Graphics. ◆ Support for AMD Eyefinity technology
	Storage Interface	<ul style="list-style-type: none"> ◆ Chipset: <ul style="list-style-type: none"> - 6 x SATA 6Gb/s connectors - Support for RAID 0, RAID 1, RAID 10, and JBOD
	USB	<ul style="list-style-type: none"> ◆ Chipset: <ul style="list-style-type: none"> - 4 x USB 3.0/2.0 ports (available through the internal USB headers) - 6 x USB 2.0/1.1 ports (2 ports on the back panel, 4 ports available through the internal USB headers) ◆ VIA® VL805 chip: <ul style="list-style-type: none"> - 4 x USB 3.0/2.0 ports on the back panel
	Internal Connectors	<ul style="list-style-type: none"> ◆ 1 x 24-pin ATX main power connector ◆ 1 x 4-pin ATX 12V power connector ◆ 6 x SATA 6Gb/s connectors ◆ 1 x APU fan header ◆ 2 x system fan headers ◆ 1 x front panel header ◆ 1 x front panel audio header ◆ 1 x S/PDIF Out header ◆ 2 x USB 3.0/2.0 headers ◆ 2 x USB 2.0/1.1 headers ◆ 1 x parallel port header ◆ 2 x serial port headers ◆ 1 x Clear CMOS jumper
	Back Panel Connectors	<ul style="list-style-type: none"> ◆ 1 x PS/2 keyboard/mouse port ◆ 1 x D-Sub port ◆ 1 x DVI-D port ◆ 1 x HDMI port ◆ 1 x DisplayPort ◆ 4 x USB 3.0/2.0 ports ◆ 2 x USB 2.0/1.1 ports ◆ 1 x RJ-45 port ◆ 3 x audio jacks (Line In, Line Out, Mic In)
	I/O Controller	<ul style="list-style-type: none"> ◆ iTE® I/O Controller Chip
	Hardware Monitor	<ul style="list-style-type: none"> ◆ System voltage detection ◆ APU/System temperature detection ◆ APU/System fan speed detection ◆ APU overheating warning ◆ APU/System fan fail warning ◆ APU/System fan speed control <ul style="list-style-type: none"> * Whether the fan speed control function is supported will depend on the cooler you install.
	BIOS	<ul style="list-style-type: none"> ◆ 1 x 64 Mbit flash ◆ Use of licensed AMI UEFI BIOS ◆ PnP 1.0a, DMI 2.7, WfM 2.0, SM BIOS 2.7, ACPI 5.0

	Unique Features	<ul style="list-style-type: none"> ◆ Support for @BIOS ◆ Support for Xpress Install ◆ Support for EasyTune <ul style="list-style-type: none"> * Available functions in EasyTune may differ by motherboard model. ◆ Support for Smart Recovery2 ◆ Support for ON/OFF Charge
	Bundled Software	<ul style="list-style-type: none"> ◆ Norton® Internet Security (OEM version)
	Operating System	<ul style="list-style-type: none"> ◆ Support for Windows 8.1/8/7
	Form Factor	<ul style="list-style-type: none"> ◆ Micro ATX Form Factor; 24.4cm x 24.4cm

* GIGABYTE reserves the right to make any changes to the product specifications and product-related information without prior notice.



Please visit GIGABYTE's website for support lists of CPU, memory modules and SSDs.



Please visit the **SupportUtility List** page on GIGABYTE's website to download the latest version of apps.

1-3 Installing the APU

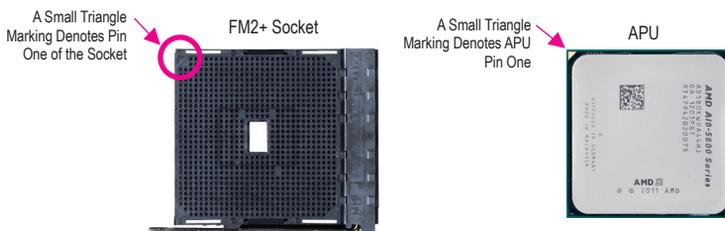


Read the following guidelines before you begin to install the APU:

- Make sure that the motherboard supports the APU.
(Go to GIGABYTE's website for the latest APU support list.)
- Always turn off the computer and unplug the power cord from the power outlet before installing the APU to prevent hardware damage.
- Locate the pin one of the APU. The APU cannot be inserted if oriented incorrectly.
- Apply an even and thin layer of thermal grease on the surface of the APU.
- Do not turn on the computer if the APU cooler is not installed, otherwise overheating and damage of the APU may occur.
- Set the APU host frequency in accordance with the APU specifications. It is not recommended that the system bus frequency be set beyond hardware specifications since it does not meet the standard requirements for the peripherals. If you wish to set the frequency beyond the standard specifications, please do so according to your hardware specifications including the APU, graphics card, memory, hard drive, etc.

Installing the APU

Locate the alignment keys on the motherboard APU socket and the notches on the APU.



1-4 Installing the Memory



Read the following guidelines before you begin to install the memory:

- Make sure that the motherboard supports the memory. It is recommended that memory of the same capacity, brand, speed, and chips be used.
(Go to GIGABYTE's website for the latest supported memory speeds and memory modules.)
- Always turn off the computer and unplug the power cord from the power outlet before installing the memory to prevent hardware damage.
- Memory modules have a foolproof design. A memory module can be installed in only one direction. If you are unable to insert the memory, switch the direction.

Dual Channel Memory Configuration

This motherboard provides four DDR3 memory sockets and supports Dual Channel Technology. After the memory is installed, the BIOS will automatically detect the specifications and capacity of the memory. Enabling Dual Channel memory mode will double the original memory bandwidth.

The four DDR3 memory sockets are divided into two channels and each channel has two memory sockets as following:

▶▶ Channel A: DDR3_2, DDR3_4

▶▶ Channel B: DDR3_1, DDR3_3



Please visit GIGABYTE's website for details on hardware installation.

►► Dual Channel Memory Configurations Table

	DDR3_4	DDR3_2	DDR3_3	DDR3_1
2 Modules	--	DS/SS	--	DS/SS
	DS/SS	--	DS/SS	--
4 Modules	DS/SS	DS/SS	DS/SS	DS/SS

(SS=Single-Sided, DS=Double-Sided, "--"=No Memory)

Due to APU limitations, read the following guidelines before installing the memory in Dual Channel mode.

1. Dual Channel mode cannot be enabled if only one memory module is installed.
2. When enabling Dual Channel mode with two or four memory modules, it is recommended that memory of the same capacity, brand, speed, and chips be used and installed in the same colored sockets. For optimum performance, when enabling Dual Channel mode with two memory modules, we recommend that you install them in the DDR3_1 and DDR3_2 sockets.

1-5 Installing an Expansion Card



Read the following guidelines before you begin to install an expansion card:

- Make sure the motherboard supports the expansion card. Carefully read the manual that came with your expansion card.
- Always turn off the computer and unplug the power cord from the power outlet before installing an expansion card to prevent hardware damage.

1-6 Setup of the AMD Dual Graphics Configuration

A. System Requirements

- An AMD A series processor that supports AMD Dual Graphics technology
- Windows 8.1/7 operating system
- An AMD Dual Graphics technology-supported motherboard and correct driver
- An AMD graphics card that supports AMD Dual Graphics technology (for more details, please visit AMD's official website) and correct driver (For an FM2+ APU, please use an AMD R7 200 series graphics card; for an FM2 APU, please use an AMD Radeon™ HD 6000 graphics card.)

B. Installing the Graphics Cards and Configuring BIOS Setup

Step 1:

Observe the steps in "1-5 Installing an Expansion Card" and install an AMD Dual Graphics technology-supported graphics card on the PCIEX16 slot. Plug the monitor cable into the graphics card and start up your computer.

Step 2:

Enter BIOS Setup to set the following items under the **Peripherals\GFX Configuration** menu:

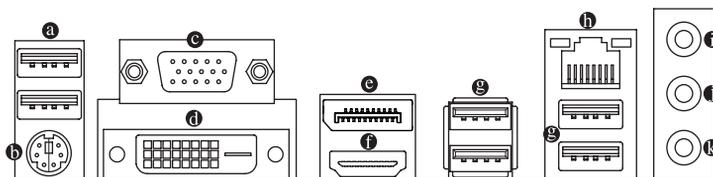
- Set **Integrated Graphics** to **Force**.
- Set **UMA Frame Buffer Size** to **512M** or above.

Save the settings and exit BIOS Setup. Restart your computer.

C. Configuring the Graphics Card Driver

After installing the graphics card driver in the operating system, go to the **AMD VISION Engine Control Center**. After installing the graphics card driver in the operating system, go to the AMD VISION Engine Control Center. Browse to **Performance\AMD Radeon™ Dual Graphics** and ensure the **Enable AMD Radeon Dual Graphics** check box is selected.

1-7 Back Panel Connectors



a USB 2.0/1.1 Port

The USB port supports the USB 2.0/1.1 specification. Use this port for USB devices.

b PS/2 Keyboard/Mouse Port

Use this port to connect a PS/2 mouse or keyboard.

c D-Sub Port

The D-Sub port supports a 15-pin D-Sub connector and supports a maximum resolution of 1920x1200 (the actual resolutions supported depend on the monitor being used). Connect a monitor that supports D-Sub connection to this port.

d DVI-D Port (Note 1)

The DVI-D port conforms to the DVI-D specification and supports a maximum resolution of 2560x1600. Connect a monitor that supports DVI-D connection to this port. Please note that the actual resolutions supported are dependent on the monitor being used and support for 2560x1600 resolution requires both a monitor and cable that support Dual Link DVI.

e DisplayPort (Note 2)

DisplayPort delivers high quality digital imaging and audio, supporting bi-directional audio transmission. DisplayPort can support both DPCP and HDCP content protection mechanisms. You can use this port to connect your DisplayPort-supported monitor. The DisplayPort Technology can support a maximum resolution of 3840x2160 but the actual resolutions supported depend on the monitor being used.

f HDMI Port

HDMI™ The HDMI port is HDCP compliant and supports Dolby True HD and DTS HD Master Audio formats. It also supports up to 192KHz/24bit 8-channel LPCM audio output. You can use this port to connect your HDMI-supported monitor. The maximum supported resolution is 4096x2160, but the actual resolutions supported are dependent on the monitor being used.



After installing the Display or HDMI device, make sure to set it as the default sound playback device.

A. Triple-Display Configurations for the Onboard Graphics:

Triple-display configurations are supported after you install motherboard drivers in OS. Only dual-display configurations are supported during the BIOS Setup or POST process (Note 3).

Triple-display configurations	Combination	Supported or Not
	D-Sub + DVI-D + HDMI	Yes
	D-Sub + DVI-D + DP	No <small>(Note 3)</small>
	DVI-D + HDMI + DP	Yes

(Note 1) The DVI-D port does not support D-Sub connection by adapter.

(Note 2) The DisplayPort does not support Hot plug. If you want to change to another graphics port when the computer is on, be sure to turn off the computer first.

(Note 3) When the D-Sub port and DisplayPort are connected at the same time, images will output from the DisplayPort only.

B. Playback of Blu-ray™ Discs:

In order to get better playback quality, when playing the Blu-ray™ discs, refer to the recommended system requirements (or better) below.

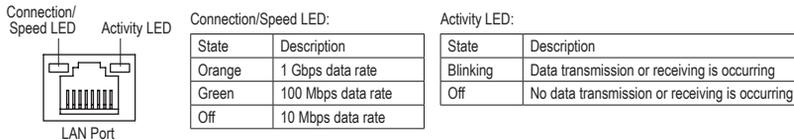
- AMD A series processors
- Memory: Two 1 GB DDR3 1333 MHz memory modules with dual channel mode enabled
- BIOS Setup: At least 512 MB of UMA Frame Buffer Size (refer to Chapter 2, "BIOS Setup," "Peripherals\ GFX Configuration," for more information)
- Playback software: CyberLink PowerDVD 10.0 or later (Note: Please ensure Hardware Acceleration is enabled. Whether Hardware Acceleration can be enabled for 3D Blu-ray™ discs is dependent on the APU being used.)
- HDCP compliant monitor(s)

④ USB 3.0/2.0 Port

The USB 3.0 port supports the USB 3.0 specification and is compatible to the USB 2.0/1.1 specification. Use this port for USB devices.

④ RJ-45 LAN Port

The Gigabit Ethernet LAN port provides Internet connection at up to 1 Gbps data rate. The following describes the states of the LAN port LEDs.



④ Line In (Blue)

The line in jack. Use this audio jack for line in devices such as an optical drive, walkman, etc.

④ Line Out (Green)

The line out jack. Use this audio jack for a headphone or 2-channel speaker. This jack can be used to connect front speakers in a 4/5.1/7.1-channel audio configuration.

④ Mic In (Pink)

The Mic in jack.

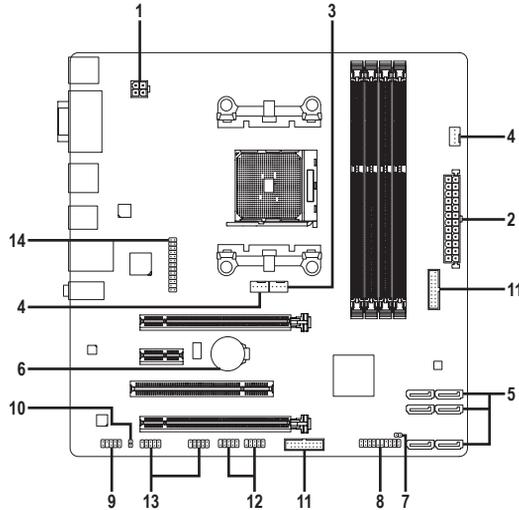


To configure 7.1-channel audio, you have to use an HD front panel audio module and enable the multi-channel audio feature through the audio driver.



- When removing the cable connected to a back panel connector, first remove the cable from your device and then remove it from the motherboard.
- When removing the cable, pull it straight out from the connector. Do not rock it side to side to prevent an electrical short inside the cable connector.

1-8 Internal Connectors



1) ATX_12V	8) F_PANEL
2) ATX	9) F_AUDIO
3) CPU_FAN	10) SPDIF_O
4) SYS_FAN1/SYS_FAN2	11) F_USB30_1/F_USB30_2
5) SATA3 0/1/2/3/4/5	12) F_USB1/F_USB2
6) BAT	13) COMA/COMB
7) CLR_CMOS	14) LPT



Read the following guidelines before connecting external devices:

- First make sure your devices are compliant with the connectors you wish to connect.
- Before installing the devices, be sure to turn off the devices and your computer. Unplug the power cord from the power outlet to prevent damage to the devices.
- After installing the device and before turning on the computer, make sure the device cable has been securely attached to the connector on the motherboard.

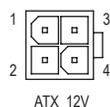
1/2) ATX_12V/ATX (2x2 12V Power Connector and 2x12 Main Power Connector)

With the use of the power connector, the power supply can supply enough stable power to all the components on the motherboard. Before connecting the power connector, first make sure the power supply is turned off and all devices are properly installed. The power connector possesses a foolproof design. Connect the power supply cable to the power connector in the correct orientation.

The 12V power connector mainly supplies power to the APU. If the 12V power connector is not connected, the computer will not start.

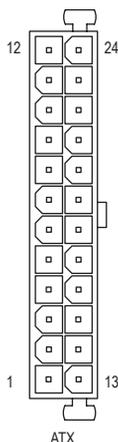


To meet expansion requirements, it is recommended that a power supply that can withstand high power consumption be used (500W or greater). If a power supply is used that does not provide the required power, the result can lead to an unstable or unbootable system.



ATX_12V:

Pin No.	Definition
1	GND
2	GND
3	+12V
4	+12V



ATX:

Pin No.	Definition	Pin No.	Definition
1	3.3V	13	3.3V
2	3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS_ON (soft On/Off)
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	Power Good	20	NC
9	5VSB (stand by +5V)	21	+5V
10	+12V	22	+5V
11	+12V (Only for 2x12-pin ATX)	23	+5V (Only for 2x12-pin ATX)
12	3.3V (Only for 2x12-pin ATX)	24	GND (Only for 2x12-pin ATX)

3/4) CPU_FAN/SYS_FAN1/SYS_FAN2 (Fan Headers)

All fan headers on this motherboard are 4-pin. Most fan headers possess a foolproof insertion design. When connecting a fan cable, be sure to connect it in the correct orientation (the black connector wire is the ground wire). The speed control function requires the use of a fan with fan speed control design. For optimum heat dissipation, it is recommended that a system fan be installed inside the chassis.



CPU_FAN:

Pin No.	Definition
1	GND
2	+12V
3	Sense
4	Speed Control



SYS_FAN1



SYS_FAN2

SYS_FAN1/SYS_FAN2:

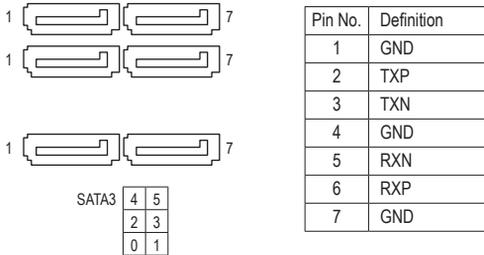
Pin No.	Definition
1	GND
2	Speed Control
3	Sense
4	Reserve



- Be sure to connect fan cables to the fan headers to prevent your APU and system from overheating. Overheating may result in damage to the APU or the system may hang.
- These fan headers are not configuration jumper blocks. Do not place a jumper cap on the headers.

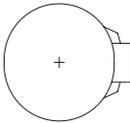
5) SATA3 0/1/2/3/4/5 (SATA 6Gb/s Connectors)

The SATA connectors conform to SATA 6Gb/s standard and are compatible with SATA 3Gb/s and SATA 1.5Gb/s standard. Each SATA connector supports a single SATA device. The AMD Chipset supports RAID 0, RAID 1, RAID 10, and JBOD. Refer to Chapter 3, "Configuring a RAID Set," for instructions on configuring a RAID array.



6) BAT (Battery)

The battery provides power to keep the values (such as BIOS configurations, date, and time information) in the CMOS when the computer is turned off. Replace the battery when the battery voltage drops to a low level, or the CMOS values may not be accurate or may be lost.



You may clear the CMOS values by removing the battery:

1. Turn off your computer and unplug the power cord.
2. Gently remove the battery from the battery holder and wait for one minute. (Or use a metal object like a screwdriver to touch the positive and negative terminals of the battery holder, making them short for 5 seconds.)
3. Replace the battery.
4. Plug in the power cord and restart your computer.



- Always turn off your computer and unplug the power cord before replacing the battery.
- Replace the battery with an equivalent one. Danger of explosion if the battery is replaced with an incorrect model.
- Contact the place of purchase or local dealer if you are not able to replace the battery by yourself or uncertain about the battery model.
- When installing the battery, note the orientation of the positive side (+) and the negative side (-) of the battery (the positive side should face up).
- Used batteries must be handled in accordance with local environmental regulations.

7) CLR_CMOS (Clear CMOS Jumper)

Use this jumper to clear the BIOS configuration and reset the CMOS values to factory defaults. To clear the CMOS values, use a metal object like a screwdriver to touch the two pins for a few seconds.



Open: Normal



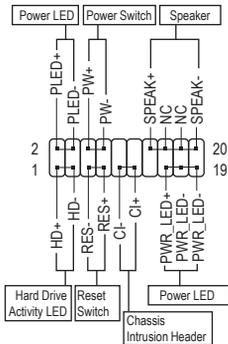
Short: Clear CMOS Values



- Always turn off your computer before clearing the CMOS values.
- After system restart, go to BIOS Setup to load factory defaults (select Load Optimized Defaults) or manually configure the BIOS settings (refer to Chapter 2, "BIOS Setup," for BIOS configurations).

8) F_PANEL (Front Panel Header)

Connect the power switch, reset switch, speaker, and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.



- **PLED/PWR_LED (Power LED):**

System Status	LED
S0	On
S3/S4/S5	Off

Connects to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED is off when the system is in S3/S4 sleep state or powered off (S5).

- **PW (Power Switch):**

Connects to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch (refer to Chapter 2, "BIOS Setup," "Power Management," for more information).

- **SPEAK (Speaker):**

Connects to the speaker on the chassis front panel. The system reports system startup status by issuing a beep code. One single short beep will be heard if no problem is detected at system startup.

- **HD (Hard Drive Activity LED):**

Connects to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data.

- **RES (Reset Switch):**

Connects to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.

- **CI (Chassis Intrusion Header):**

Connects to the chassis intrusion switch/sensor on the chassis that can detect if the chassis cover has been removed. This function requires a chassis with a chassis intrusion switch/sensor.

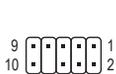
- **NC: No Connection.**



The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.

9) F_AUDIO (Front Panel Audio Header)

The front panel audio header supports Intel High Definition audio (HD) and AC'97 audio. You may connect your chassis front panel audio module to this header. Make sure the wire assignments of the module connector match the pin assignments of the motherboard header. Incorrect connection between the module connector and the motherboard header will make the device unable to work or even damage it.



For HD Front Panel Audio:

Pin No.	Definition	Pin No.	Definition
1	MIC2_L	6	Sense
2	GND	7	FAUDIO_JD
3	MIC2_R	8	No Pin
4	-ACZ_DET	9	LINE2_L
5	LINE2_R	10	Sense

For AC'97 Front Panel Audio:

Pin No.	Definition	Pin No.	Definition
1	MIC	6	NC
2	GND	7	NC
3	MIC Power	8	No Pin
4	NC	9	Line Out (L)
5	Line Out (R)	10	NC



- The front panel audio header supports HD audio by default.
- Audio signals will be present on both of the front and back panel audio connections simultaneously.
- Some chassis provide a front panel audio module that has separated connectors on each wire instead of a single plug. For information about connecting the front panel audio module that has different wire assignments, please contact the chassis manufacturer.

10) SPDIF_O (S/PDIF Out Header)

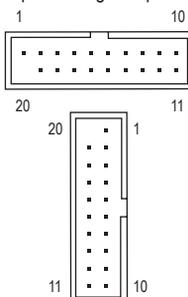
This header supports digital S/PDIF Out and connects a S/PDIF digital audio cable (provided by expansion cards) for digital audio output from your motherboard to certain expansion cards like graphics cards and sound cards. For example, some graphics cards may require you to use a S/PDIF digital audio cable for digital audio output from your motherboard to your graphics card if you wish to connect an HDMI display to the graphics card and have digital audio output from the HDMI display at the same time. For information about connecting the S/PDIF digital audio cable, carefully read the manual for your expansion card.



Pin No.	Definition
1	SPDIFO
2	GND

11) F_USB30_1/F_USB30_2 (USB 3.0/2.0 Headers)

The headers conform to USB 3.0/2.0 specification and each header can provide two USB ports. For purchasing the optional 3.5" front panel that provides two USB 3.0/2.0 ports, please contact the local dealer.



Pin No.	Definition	Pin No.	Definition	Pin No.	Definition
1	VBUS	8	D1-	15	SSTX2-
2	SSRX1-	9	D1+	16	GND
3	SSRX1+	10	NC	17	SSRX2+
4	GND	11	D2+	18	SSRX2-
5	SSTX1-	12	D2-	19	VBUS
6	SSTX1+	13	GND	20	No Pin
7	GND	14	SSTX2+		

12) F_USB1/F_USB2 (USB 2.0/1.1 Headers)

The headers conform to USB 2.0/1.1 specification. Each USB header can provide two USB ports via an optional USB bracket. For purchasing the optional USB bracket, please contact the local dealer.



Pin No.	Definition	Pin No.	Definition
1	Power (5V)	6	USB DY+
2	Power (5V)	7	GND
3	USB DX-	8	GND
4	USB DY-	9	No Pin
5	USB DX+	10	NC



- Do not plug the IEEE 1394 bracket (2x5-pin) cable into the USB header.
- Prior to installing the USB bracket, be sure to turn off your computer and unplug the power cord from the power outlet to prevent damage to the USB bracket.

13) COMA/COMB (Serial Port Headers)

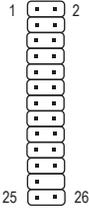
The COM header can provide one serial port via an optional COM port cable. For purchasing the optional COM port cable, please contact the local dealer.



Pin No.	Definition	Pin No.	Definition
1	NDCD-	6	NDSR-
2	NSIN	7	NRTS-
3	NSOUT	8	NCTS-
4	NDTR-	9	NRI-
5	GND	10	No Pin

14) LPT (Parallel Port Header)

The LPT header can provide one parallel port via an optional LPT port cable. For purchasing the optional LPT port cable, please contact the local dealer.



Pin No.	Definition	Pin No.	Definition	Pin No.	Definition
1	STB-	10	GND	19	ACK-
2	AFD-	11	PD4	20	GND
3	PD0	12	GND	21	BUSY
4	ERR-	13	PD5	22	GND
5	PD1	14	GND	23	PE
6	INIT-	15	PD6	24	No Pin
7	PD2	16	GND	25	SLCT
8	SLIN-	17	PD7	26	GND
9	PD3	18	GND		

Chapter 2 BIOS Setup

BIOS (Basic Input and Output System) records hardware parameters of the system in the CMOS on the motherboard. Its major functions include conducting the Power-On Self-Test (POST) during system startup, saving system parameters and loading operating system, etc. BIOS includes a BIOS Setup program that allows the user to modify basic system configuration settings or to activate certain system features.

When the power is turned off, the battery on the motherboard supplies the necessary power to the CMOS to keep the configuration values in the CMOS.

To access the BIOS Setup program, press the <Delete> key during the POST when the power is turned on.



- Because BIOS flashing is potentially risky, if you do not encounter problems using the current version of BIOS, it is recommended that you not flash the BIOS. To flash the BIOS, do it with caution. Inadequate BIOS flashing may result in system malfunction.
- It is recommended that you not alter the default settings (unless you need to) to prevent system instability or other unexpected results. Inadequately altering the settings may result in system's failure to boot. If this occurs, try to clear the CMOS values and reset the board to default values. (Refer to the "Load Optimized Defaults" section in this chapter or introductions of the battery/clear CMOS jumper in Chapter 1 for how to clear the CMOS values.)

2-1 Startup Screen

The following startup Logo screen will appear when the computer boots.
(Sample BIOS Version: E6)

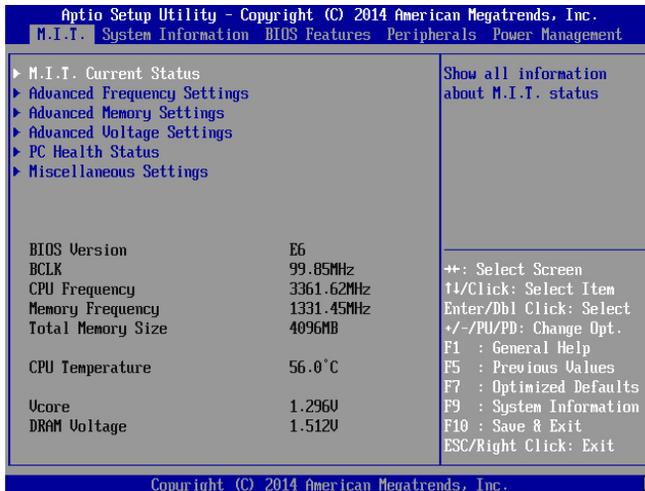


On the main menu of the BIOS Setup program, press arrow keys to move among the items and press <Enter> to accept or enter a sub-menu. Or you can use your mouse to select the item you want.



- When the system is not stable as usual, select the **Load Optimized Defaults** item to set your system to its defaults.
- The BIOS Setup menus described in this chapter are for reference only and may differ by BIOS version.

2-2 M.I.T.



This section provides information on the BIOS version, CPU base clock, CPU frequency, memory frequency, total memory size, CPU temperature, Vcore, and memory voltage.



Whether the system will work stably with the overclock/overvoltage settings you made is dependent on your overall system configurations. Incorrectly doing overclock/overvoltage may result in damage to CPU, chipset, or memory and reduce the useful life of these components. This page is for advanced users only and we recommend you not to alter the default settings to prevent system instability or other unexpected results. (Inadequately altering the settings may result in system's failure to boot. If this occurs, clear the CMOS values and reset the board to default values.)

▶ **M.I.T. Current Status**

This screen provides information on CPU/memory frequencies/parameters.

▶ **Advanced Frequency Settings**

☞ **CPU Clock Control**

Allows you to manually set the CPU base clock in 1 MHz increments. (Default: Auto)

Important: It is highly recommended that the CPU frequency be set in accordance with the CPU specifications.

☞ **Processor Graphics Clock**

Allows you to set the onboard graphics clock. The adjustable range is from 300 MHz to 2000 MHz.

☞ **CPU NorthBridge Frequency**

Allows you to manually set the CPU North Bridge frequency. The adjustable range is from 800 MHz to 6000 MHz. (Default: Auto)

☞ **CPU Clock Ratio**

Allows you to alter the clock ratio for the installed CPU. The adjustable range is dependent on the CPU being installed. (Default: Auto)

☞ **CPU Frequency**

Displays the current operating CPU frequency.

▶ **Advanced CPU Core Settings**

☞ **CPU Clock Ratio, CPU Frequency**

The settings above are synchronous to those under the same items on the **Advanced Frequency Settings** menu.

☞ **Core Performance Boost** ^(Note)

Allows you to determine whether to enable the Core Performance Boost (CPB) technology, a CPU performance-boost technology. (Default: Auto)

☞ **Turbo Performance Boost Ratio** ^(Note)

Allows you to determine whether to improve CPU performance. (Default: Disabled)

☞ **Core Performance Boost Ratio** ^(Note)

Allows you alter the ratio for the CPB. The adjustable range is dependent on the CPU being installed. (Default: Auto)

☞ **AMD Cool&Quiet function**

- ▶ Enabled Lets the AMD Cool'n'Quiet driver dynamically adjust the CPU clock and VID to reduce heat output from your computer and its power consumption. (Default)
- ▶ Disabled Disables this function.

☞ **cTDP function**

Allows you to set the TDP consumption. Options are Disabled, 45W, 65W. (Default: Disabled)

☞ **SVM Mode**

Virtualization enhanced by Virtualization Technology will allow a platform to run multiple operating systems and applications in independent partitions. With virtualization, one computer system can function as multiple virtual systems. (Default: Enabled)

☞ **C6 Mode**

Allows you to determine whether to let the CPU enter C6 mode in system halt state. When enabled, the CPU core frequency will be reduced during system halt state to decrease power consumption. The C6 state is a more enhanced power-saving state than C1. (Default: Enabled)

☞ **CPU core Control**

Allows you to determine whether to manually enable/disable CPU cores. **Automatic mode** allows the BIOS to enable all CPU cores (number of cores available depends on the CPU being used). (Default: Automatic mode)

(Note) This item is present only when you install a CPU that supports this feature.

- ☞ **APM**
Enables or disables Application Power Management. (Default: Enabled)
- ☞ **Extreme Memory Profile (X.M.P.)** ^(Note)
Allows the BIOS to read the SPD data on XMP memory module(s) to enhance memory performance when enabled.

 - ▶▶ Disabled Disables this function. (Default)
 - ▶▶ Profile1 Uses Profile 1 settings.
 - ▶▶ Profile2 ^(Note) Uses Profile 2 settings.
- ☞ **AMD Memory Profile (A.M.P.)** ^(Note)
Allows the BIOS to read the SPD data on AMP memory module(s) to enhance memory performance when enabled. (Default: Disabled)
- ☞ **System Memory Multiplier**
Allows you to set the system memory multiplier. **Auto** sets memory multiplier according to memory SPD data. (Default: Auto)
- ☞ **Memory Frequency (MHz)**
This value is automatically adjusted according to the **CPU Clock Control** and **System Memory Multiplier** settings.
- ▶ **Advanced Memory Settings**

 - ☞ **Extreme Memory Profile (X.M.P.)** ^(Note), **System Memory Multiplier**, **Memory Frequency(MHz)**
The settings above are synchronous to those under the same items on the **Advanced Frequency Settings** menu.
 - ☞ **Memory Timing Mode**
Manual and **Advanced Manual** allows the **Channel Interleaving**, **Rank Interleaving**, and memory timing settings below to be configurable. Options are: Auto (default), Manual, Advanced Manual.
 - ☞ **Profile DDR Voltage**
When using a non-XMP memory module or **Extreme Memory Profile (X.M.P.)** is set to **Disabled**, the value is displayed according to your memory specification. When **Extreme Memory Profile (X.M.P.)** is set to **Profile1** or **Profile2**, the value is displayed according to the SPD data on the XMP memory.
 - ☞ **Channel Interleaving**
Enables or disables memory channel interleaving. **Enabled** allows the system to simultaneously access different channels of the memory to increase memory performance and stability. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)
 - ☞ **Rank Interleaving**
Enables or disables memory rank interleaving. **Enabled** allows the system to simultaneously access different ranks of the memory to increase memory performance and stability. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)
- ▶ **Channel A/B Memory Sub Timings**
This sub-menu provides memory timing settings for each channel of memory. This sub-menu provides memory timing settings for each channel of memory. The respective timing setting screens are configurable only when **Memory Timing Mode** is set to **Manual** or **Advanced Manual**. Note: Your system may become unstable or fail to boot after you make changes on the memory timings. If this occurs, please reset the board to default values by loading optimized defaults or clearing the CMOS values.
- ▶ **Advanced Voltage Settings**
This sub-menu allows you to set CPU, chipset and memory voltages.

(Note) This item is present only when you install a CPU and a memory module that support this feature.

▶ PC Health Status

⊖ Reset Case Open Status

- ▶ Disabled Keeps or clears the record of previous chassis intrusion status. (Default)
- ▶ Enabled Clears the record of previous chassis intrusion status and the **Case Open** field will show "No" at next boot.

⊖ Case Open

Displays the detection status of the chassis intrusion detection device attached to the motherboard CI header. If the system chassis cover is removed, this field will show "Yes", otherwise it will show "No". To clear the chassis intrusion status record, set **Reset Case Open Status** to **Enabled**, save the settings to the CMOS, and then restart your system.

⊖ CPU Vcore/DRAM Voltage/+3.3V/+5V/+12V

Displays the current system voltages.

⊖ CPU/System Temperature

Displays current CPU/system temperature.

⊖ CPU/System Fan Speed

Displays current CPU/system fan speeds.

⊖ CPU Temperature Warning

Sets the warning threshold for CPU temperature. When temperature exceeds the threshold, BIOS will emit warning sound. Options are: Disabled (default), 60°C/140°F, 70°C/158°F, 80°C/176°F, 90°C/194°F.

⊖ CPU/System Fan Fail Warning

Allows the system to emit warning sound if the CPU fan or system fan are not connected or fail. Check the fan condition or fan connection when this occurs. (Default: Disabled)

⊖ CPU Fan Speed Control

Allows you to determine whether to enable the fan speed control function and adjust the fan speed.

- ▶ Normal Allows the fan to run at different speeds according to the CPU temperature. You can adjust the fan speed with EasyTune based on your system requirements. (Default)
- ▶ Silent Allows the fan to run at slow speeds.
- ▶ Manual Allows you to control the fan speed under the **Fan Speed Percentage** item.
- ▶ Full Speed Allows the fan to run at full speeds.

⊖ Fan Speed Percentage

Allows you to control the CPU fan speed. This item is configurable only when **CPU Fan Speed Control** is set to **Manual**. Options are: 0.75 PWM value /°C ~ 2.50 PWM value /°C.

⊖ 1st System Fan Speed Control (SYS_FAN1 Connector)

Allows you to determine whether to enable the fan speed control function and adjust the fan speed.

- ▶ Normal Allows the fan to run at different speeds according to the system temperature. You can adjust the fan speed with EasyTune based on your system requirements. (Default)
- ▶ Silent Allows the fan to run at slow speeds.
- ▶ Manual Allows you to control the fan speed under the **Fan Speed Percentage** item.
- ▶ Full Speed Allows the fan to run at full speeds.

⊖ Fan Speed Percentage

Allows you to control the system fan speed. This item is configurable only when **1st System Fan Speed Control** is set to **Manual**. Options are: 0.75 PWM value /°C ~ 2.50 PWM value /°C.

⊖ 2nd System Fan Speed Control (SYS_FAN2 Connector)

Allows you to determine whether to enable the fan speed control function and adjust the fan speed.

- ▶ Normal Allows the fan to run at different speeds according to the system temperature. You can adjust the fan speed with EasyTune based on your system requirements. (Default)
- ▶ Silent Allows the fan to run at slow speeds.
- ▶ Manual Allows you to control the fan speed under the **Fan Speed Percentage** item.
- ▶ Full Speed Allows the fan to run at full speeds.

☞ Fan Speed Percentage

Allows you to control the system fan speed. This item is configurable only when **2nd System Fan Speed Control** is set to **Manual**. Options are: 0.75 PWM value /°C ~ 2.50 PWM value /°C.

▶ Miscellaneous Settings

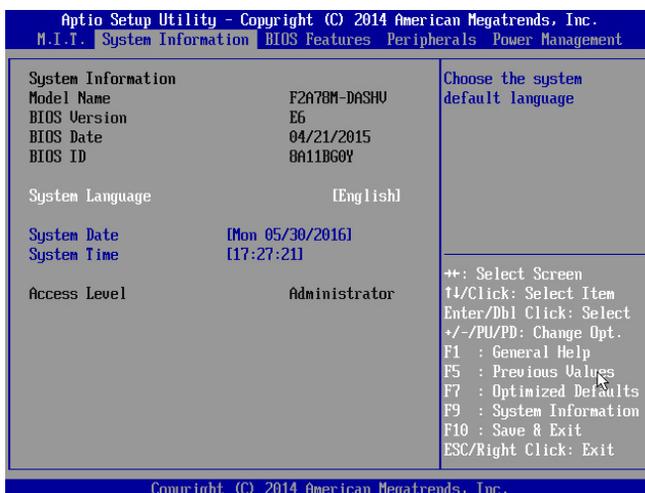
☞ PCIe Slot Configuration

Allows you to set the operation mode of the PCI Express slots to Gen 1, Gen 2, or Gen 3. Actual operation mode is subject to the hardware specification of each slot. **Auto** lets the BIOS automatically configure this setting. (Default: Auto)

☞ 3DMark01 Boost

Allows you to determine whether to enhance some legacy benchmark performance. (Default: Disabled)

2-3 System Information



This section provides information on your motherboard model and BIOS version. You can also select the default language used by the BIOS and manually set the system time.

☞ System Language

Selects the default language used by the BIOS.

☞ System Date

Sets the system date. The date format is week (read-only), month, date, and year. Use <Enter> to switch between the Month, Date, and Year fields and use the <Page Up> or <Page Down> key to set the desired value.

☞ System Time

Sets the system time. The time format is hour, minute, and second. For example, 1 p.m. is 13:00:00. Use <Enter> to switch between the Hour, Minute, and Second fields and use the <Page Up> or <Page Down> key to set the desired value.

☞ Access Level

Displays the current access level depending on the type of password protection used. (If no password is set, the default will display as **Administrator**.) The Administrator level allows you to make changes to all BIOS settings; the User level only allows you to make changes to certain BIOS settings but not all.

2-4 BIOS Features



☞ Boot Option Priorities

Specifies the overall boot order from the available devices. For example, you can set hard drive as the first priority (**Boot Option #1**) and DVD ROM drive as the second priority (**Boot Option #2**). The list only displays the device with the highest priority for a specific type. For example, only hard drive defined as the first priority on the **Hard Drive BBS Priorities** submenu will be presented here. Removable storage devices that support GPT format will be prefixed with "UEFI:" string on the boot device list. To boot from an operating system that supports GPT partitioning, select the device prefixed with "UEFI:" string.

Or if you want to install an operating system that supports GPT partitioning such as Windows 7 64-bit, select the optical drive that contains the Windows 7 64-bit installation disk and is prefixed with "UEFI:" string.

☞ Hard Drive/CD/DVD ROM Drive/Floppy Drive/Network Device BBS Priorities

Specifies the boot order for a specific device type, such as hard drives, optical drives, floppy disk drives, and devices that support Boot from LAN function, etc. Press <Enter> on this item to enter the submenu that presents the devices of the same type that are connected. This item is present only if at least one device for this type is installed.

☞ Bootup NumLock State

Enables or disables Numlock feature on the numeric keypad of the keyboard after the POST. (Default: Enabled)

☞ Security Option

Specifies whether a password is required every time the system boots, or only when you enter BIOS Setup. After configuring this item, set the password(s) under the **Administrator Password/User Password** item.

- Setup A password is only required for entering the BIOS Setup program.
- System A password is required for booting the system and for entering the BIOS Setup program. (Default)

☞ Full Screen LOGO Show

Allows you to determine whether to display the GIGABYTE Logo at system startup. **Disabled** skips the GIGABYTE Logo when the system starts up. (Default: Enabled)

- ☞ **Fast Boot**
 Enables or disables Fast Boot to shorten the OS boot process. **Ultra Fast** provides the fastest bootup speed. (Default: Disabled)
- ☞ **VGA Support**
 Allows you to select which type of operating system to boot.

 - ▶▶ Auto Enables legacy option ROM only.
 - ▶▶ EFI Driver Enables EFI option ROM. (Default)

This item is configurable only when **Fast Boot** is set to **Enabled** or **Ultra Fast**.
- ☞ **USB Support**

 - ▶▶ Disabled All USB devices are disabled before the OS boot process completes.
 - ▶▶ Full Initial All USB devices are functional in the operating system and during the POST.
 - ▶▶ Partial Initial Part of the USB devices are disabled before the OS boot process completes. (Default)

This item is configurable only when **Fast Boot** is set to **Enabled**. This item is disabled when **Fast Boot** is set to **Ultra Fast**.
- ☞ **PS2 Devices Support**

 - ▶▶ Disabled All PS/2 devices are disabled before the OS boot process completes.
 - ▶▶ Enabled All PS/2 devices are functional in the operating system and during the POST. (Default)

This item is configurable only when **Fast Boot** is set to **Enabled**. This item is disabled when **Fast Boot** is set to **Ultra Fast**.
- ☞ **NetWork Stack Driver Support**

 - ▶▶ Disabled Disables booting from the network. (Default)
 - ▶▶ Enabled Enables booting from the network.

This item is configurable only when **Fast Boot** is set to **Enabled** or **Ultra Fast**.
- ☞ **Windows 8 Features**
 Allows you to select the operating system to be installed. (Default: Other OS)
- ☞ **CSM Support**
 Enables or disables UEFI CSM (Compatibility Support Module) to support a legacy PC boot process.

 - ▶▶ Always Enables UEFI CSM. (Default)
 - ▶▶ Never Disables UEFI CSM and supports UEFI BIOS boot process only.

This item is configurable only when **Windows 8 Features** is set to **Windows 8** or **Windows 8 WHQL**.
- ☞ **Boot Mode Selection**
 Allows you to select which type of operating system to boot.

 - ▶▶ UEFI and Legacy Allows booting from operating systems that support legacy option ROM or UEFI option ROM. (Default)
 - ▶▶ Legacy Only Allows booting from operating systems that only support legacy Option ROM.
 - ▶▶ UEFI Only Allows booting from operating systems that only support UEFI Option ROM.

This item is configurable only when **CSM Support** is set to **Always**.
- ☞ **LAN PXE Boot Option ROM**
 Allows you to select whether to enable the legacy option ROM for the LAN controller. (Default: Disabled)
 This item is configurable only when **CSM Support** is set to **Always**.

☞ **Storage Boot Option Control**

Allows you to select whether to enable the UEFI or legacy option ROM for the storage device controller.

- ▶▶ Disabled Disables option ROM.
- ▶▶ Legacy Only Enables legacy option ROM only. (Default)
- ▶▶ UEFI Only Enables UEFI option ROM only.
- ▶▶ Legacy First Enables legacy option ROM first.
- ▶▶ UEFI First Enables UEFI option ROM first.

This item is configurable only when **CSM Support** is set to **Always**.

☞ **Other PCI Device ROM Priority**

Allows you to select whether to enable the UEFI or Legacy option ROM for the PCI device controller other than the LAN, storage device, and graphics controllers.

- ▶▶ Legacy OpROM Enables legacy option ROM only.
- ▶▶ UEFI OpROM Enables UEFI option ROM only. (Default)

This item is configurable only when **CSM Support** is set to **Always**.

☞ **Network stack**

Disables or enables booting from the network to install a GPT format OS, such as installing the OS from the Windows Deployment Services server. (Default: Disabled)

☞ **Ipv4 PXE Support**

Enables or disables IPv4 PXE Support. This item is configurable only when **Network stack** is enabled.

☞ **Ipv6 PXE Support**

Enables or disables IPv6 PXE Support. This item is configurable only when **Network stack** is enabled.

☞ **PXE boot wait time**

Allows you to configure how long to wait before you can press <Esc> to abort the PXE boot. This item is configurable only when **Network stack** is enabled.

☞ **Administrator Password**

Allows you to configure an administrator password. Press <Enter> on this item, type the password, and then press <Enter>. You will be requested to confirm the password. Type the password again and press <Enter>. You must enter the administrator password (or user password) at system startup and when entering BIOS Setup. Differing from the user password, the administrator password allows you to make changes to all BIOS settings.

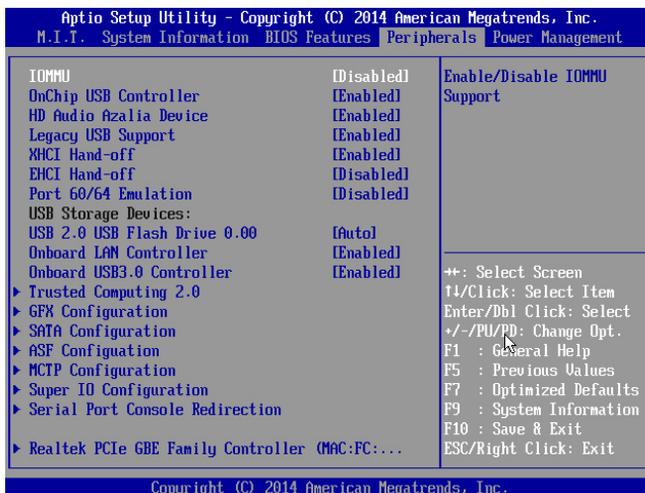
☞ **User Password**

Allows you to configure a user password. Press <Enter> on this item, type the password, and then press <Enter>. You will be requested to confirm the password. Type the password again and press <Enter>. You must enter the administrator password (or user password) at system startup and when entering BIOS Setup. However, the user password only allows you to make changes to certain BIOS settings but not all.

To cancel the password, press <Enter> on the password item and when requested for the password, enter the correct one first. When prompted for a new password, press <Enter> without entering any password. Press <Enter> again when prompted to confirm.

NOTE: Before setting the User Password, be sure to set the Administrator Password first.

2-5 Peripherals



- ☞ **IOMMU**
Enables or disables AMD IOMMU support. (Default: Disabled)
- ☞ **OnChip USB Controller**
Enables or disables the integrated USB controller. (Default: Enabled)
- ☞ **HD Audio Azalia Device**
Enables or disables the onboard audio function. (Default: Enabled)
If you wish to install a 3rd party add-in audio card instead of using the onboard audio, set this item to **Disabled**.
- ☞ **Legacy USB Support**
Allows USB keyboard/mouse to be used in MS-DOS. (Default: Enabled)
- ☞ **XHCI Hand-off**
Determines whether to enable XHCI Hand-off feature for an operating system without XHCI Hand-off support. (Default: Enabled)
- ☞ **EHCI Hand-off**
Determines whether to enable EHCI Hand-off feature for an operating system without EHCI Hand-off support. (Default: Disabled)
- ☞ **Port 60/64 Emulation**
Enables or disables emulation of I/O ports 64h and 60h. This should be enabled for full legacy support for USB keyboards/mice in MS-DOS or in operating system that does not natively support USB devices. (Default: Disabled)
- ☞ **USB Storage Devices**
Displays a list of connected USB mass storage devices. This item appears only when a USB storage device is installed.
- ☞ **Onboard LAN Controller**
Enables or disables the onboard LAN function. (Default: Enabled)
If you wish to install a 3rd party add-in network card instead of using the onboard LAN, set this item to **Disabled**.
- ☞ **Onboard USB3.0 Controller (VIA® VL805 USB Controller)**
Enables or disables the VIA® VL805 USB controller. (Default: Enabled)

▶ **Trusted Computing 2.0**

☞ **Security Device Support**

Enables or disables Trusted Platform Module (TPM). (Default: Enable)

▶ **GFX Configuration**

☞ **Primary Video Device**

Specifies the first initiation of the monitor display from the installed PCI Express graphics card or the onboard graphics.

- ▶▶ IGD Video Sets the onboard graphics as the first display.
- ▶▶ NB PCIe Slot Video Sets the PCI Express graphics card on the PCI Express slot controlled by the North Bridge as the first display. (Default)
- ▶▶ SB PCIe Slot Video Sets the PCI Express graphics card on the PCI Express slot controlled by the South Bridge as the first display.

☞ **Integrated Graphics**

Enables or disables the onboard graphics function.

- ▶▶ Auto The BIOS will automatically enable or disable the onboard graphics depending on the graphics card being installed. (Default)
- ▶▶ Disabled Disables the onboard graphics.
- ▶▶ Force Always activates the onboard graphics, whether or not a PCI Express card is installed.

☞ **UMA Frame Buffer Size**

This item is configurable only when **Integrated Graphics** is set to **Force**. Frame buffer size is the total amount of system memory allocated solely for the onboard graphics controller. MS-DOS, for example, will use only this memory for display.

Options are: Auto (default), 32M, 64M, 128M, 256M, 512M, 1G, 2G.

▶ **SATA Configuration**

☞ **OnChip SATA Channel**

Enables or disables the integrated SATA controllers. (Default: Enabled)

☞ **OnChip SATA Type (SATA3 0~SATA3 3 connectors)**

Enables or disables RAID for the SATA controllers integrated in the Chipset or configures the SATA controllers to AHCI mode.

- ▶▶ Native IDE Configures the SATA controller to IDE mode.
- ▶▶ RAID Enables RAID for the SATA controller.
- ▶▶ AHCI Configures the SATA controllers to AHCI mode. Advanced Host Controller Interface (AHCI) is an interface specification that allows the storage driver to enable advanced Serial ATA features such as Native Command Queuing and hot plug. (Default)

☞ **OnChip SATA Port4/5 Type (SATA3 4/SATA3 5 connectors)**

This option is configurable only when **OnChip SATA Type** is set to **RAID** or **AHCI**. Configures the operating mode of the integrated SATA3 4~SATA3 5 connectors.

- ▶▶ As SATA Type The mode depends on the **OnChip SATA Type** settings. (Default)
- ▶▶ IDE Configures the SATA3 4~SATA3 5 connectors to PATA mode.

☞ **PORT0 Hot Plug~PORT5 Hot Plug**

Enables or disable the hot plug capability for each SATA port. (Default: Disabled)

☞ **SATA Power on PORT0~SATA Power on PORT5**

Enables or disables each SATA port. (Default: Enabled)

▶ **ASF Configuration**

Enables or disables the Alert Standard Format (ASF) network management capabilities of the Realtek® LAN chip.

▶ **MCTP Configuration**

Enables or disables the Management Component Transport Protocol (MCTP) for the Realtek® LAN chip.

▶ **Super IO Configuration**

This section provides information on the super I/O chip and allows you to configure the serial port and parallel port.

↳ **Serial Port A/B**

Enables or disables the onboard serial port. (Default: Enabled)

↳ **Parallel Port**

Enables or disables the onboard parallel port. (Default: Enabled)

↳ **Device Mode**

This item is configurable only when **Parallel Port** is set to **Enabled**. Selects an operating mode for the onboard parallel (LPT) port. Options are: Standard Parallel Port Mode (Default), EPP Mode (Enhanced Parallel Port), ECP Mode (Extended Capabilities Port), EPP Mode & ECP Mode.

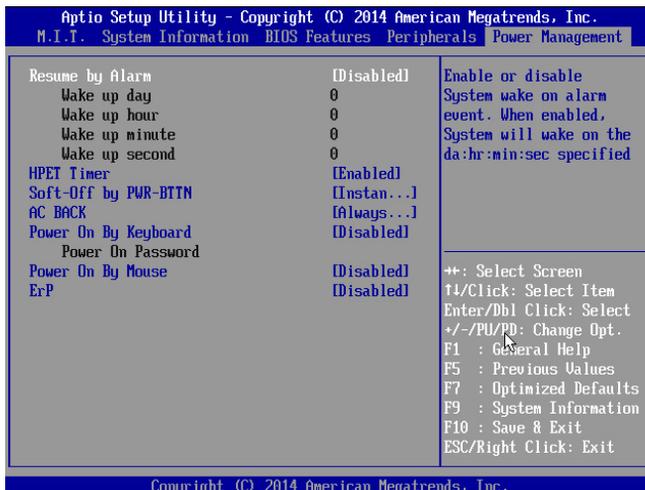
▶ **Serial Port Console Redirection**

This section allows you to enable/disable serial port console redirection for remote server management through a serial port.

▶ **Realtek PCIe GBE Family Controller**

This sub-menu provides information on LAN configuration.

2-6 Power Management



↳ **Resume by Alarm**

Determines whether to power on the system at a desired time. (Default: Disabled)

If enabled, set the date and time as following:

- ▶▶ Wake up day: Turn on the system at a specific time on each day or on a specific day in a month.
 - ▶▶ Wake up hour/minute/second: Set the time at which the system will be powered on automatically.
- Note: When using this function, avoid inadequate shutdown from the operating system or removal of the AC power, or the settings may not be effective.

☞ **HPET Timer**

Enables or disables High Precision Event Timer (HPET) for Windows 8.1/8/7 operating system. (Default: Enabled)

☞ **Soft-Off by PWR-BTTN**

Configures the way to turn off the computer in MS-DOS mode using the power button.

- ▶▶ Instant-Off Press the power button and then the system will be turned off instantly. (Default)
- ▶▶ Delay 4 Sec. Press and hold the power button for 4 seconds to turn off the system. If the power button is pressed for less than 4 seconds, the system will enter suspend mode.

☞ **AC BACK**

Determines the state of the system after the return of power from an AC power loss.

- ▶▶ Memory The system returns to its last known awake state upon the return of the AC power.
- ▶▶ Always On The system is turned on upon the return of the AC power.
- ▶▶ Always Off The system stays off upon the return of the AC power. (Default)

☞ **Power On By Keyboard**

Allows the system to be turned on by a PS/2 keyboard wake-up event.

Note: To use this function, you need an ATX power supply providing at least 1A on the +5VSB lead.

- ▶▶ Disabled Disables this function. (Default)
- ▶▶ Password Set a password with 1~5 characters to turn on the system.
- ▶▶ Keyboard 98 Press POWER button on the Windows 98 keyboard to turn on the system.
- ▶▶ Any Key Press any key to turn on the system.

☞ **Power On Password**

Set the password when **Power On By Keyboard** is set to **Password**.

Press <Enter> on this item and set a password with up to 5 characters and then press <Enter> to accept. To turn on the system, enter the password and press <Enter>.

Note: To cancel the password, press <Enter> on this item. When prompted for the password, press <Enter> again without entering the password to clear the password settings.

☞ **Power On By Mouse**

Allows the system to be turned on by a PS/2 mouse wake-up event.

Note: To use this function, you need an ATX power supply providing at least 1A on the +5VSB lead.

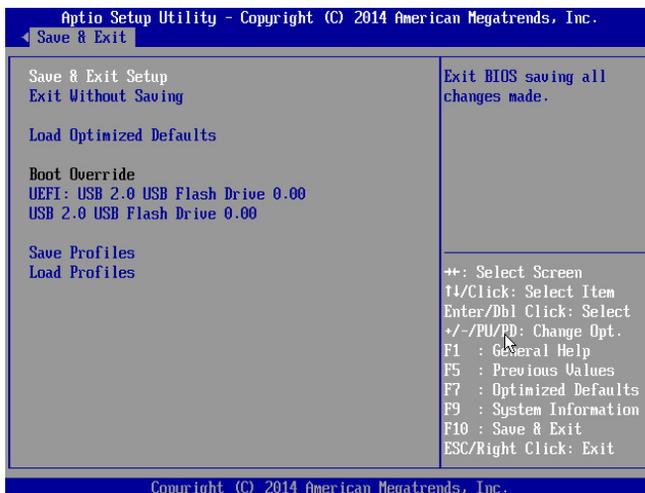
- ▶▶ Disabled Disables this function. (Default)
- ▶▶ Move Move the mouse to turn on the system.
- ▶▶ Double Click Double click on left button on the mouse to turn on the system.

☞ **ErP**

Determines whether to let the system consume least power in S5 (shutdown) state. (Default: Disabled)

Note: When this item is set to **Enabled**, the following functions will become unavailable: Resume by Alarm, PME event wake up, power on by mouse, power on by keyboard, and wake on LAN.

2-7 Save & Exit



- **Save & Exit Setup**
Press <Enter> on this item and select **Yes**. This saves the changes to the CMOS and exits the BIOS Setup program. Select **No** or press <Esc> to return to the BIOS Setup Main Menu.
- **Exit Without Saving**
Press <Enter> on this item and select **Yes**. This exits the BIOS Setup without saving the changes made in BIOS Setup to the CMOS. Select **No** or press <Esc> to return to the BIOS Setup Main Menu.
- **Load Optimized Defaults**
Press <Enter> on this item and select **Yes** to load the optimal BIOS default settings. The BIOS defaults settings help the system to operate in optimum state. Always load the Optimized defaults after updating the BIOS or after clearing the CMOS values.
- **Boot Override**
Allows you to select a device to boot immediately. Press <Enter> on the device you select and select **Yes** to confirm. Your system will restart automatically and boot from that device.
- **Save Profiles**
This function allows you to save the current BIOS settings to a profile. You can create up to 8 profiles and save as Setup Profile 1~ Setup Profile 8. Press <Enter> to complete. Or you can select **Select File in HDD/USB/FDD** to save the profile to your storage device.
- **Load Profiles**
If your system becomes unstable and you have loaded the BIOS default settings, you can use this function to load the BIOS settings from a profile created before, without the hassles of reconfiguring the BIOS settings. First select the profile you wish to load and then press <Enter> to complete. You can select **Select File in HDD/USB/FDD** to input the profile previously created from your storage device or load the profile automatically created by the BIOS, such as reverting the BIOS settings to the last settings that worked properly (last known good record).

Chapter 3 Appendix

3-1 Configuring a RAID Set

RAID Levels

	RAID 0	RAID 1	RAID 10
Minimum Number of Hard Drives	≥2	2	4
Array Capacity	Number of hard drives * Size of the smallest drive	Size of the smallest drive	(Number of hard drives/2) * Size of the smallest drive
Fault Tolerance	No	Yes	Yes

Before you begin, please prepare the following items:

- At least two SATA hard drives (to ensure optimal performance, it is recommended that you use two hard drives with identical model and capacity). If you do not want to create RAID, you may prepare only one hard drive.
- Windows setup disk.
- Motherboard driver disk.
- A USB flash drive.

Configuring the Onboard SATA Controller

A. Installing SATA hard drive(s) in your computer

Attach one end of the SATA signal cable to the rear of the SATA hard drive and the other end to available SATA port on the motherboard. Then connect the power connector from your power supply to the hard drive.

B. Configuring SATA controller mode in BIOS Setup

Make sure to configure the SATA controller mode correctly in system BIOS Setup. For the BIOS Setup menus, refer to Chapter 2, "BIOS Setup," "Integrated Peripherals."

Steps:

1. Turn on your computer and press <Delete> to enter BIOS Setup during the POST (Power-On Self-Test). Ensure **OnChip SATA Channel** is enabled under **Peripherals/SATA Configuration**. To enable RAID for the SATA3 0/1/2/3 connectors, set **OnChip SATA Type** to **RAID**. To enable RAID for the SATA3 4/SATA3 5 connectors, set **OnChip SATA Type** to **RAID** and set **OnChip SATA Port4/5 Type** to **As SATA Type**.
2. If you want to configure UEFI RAID, follow the steps in "C-1." To enter the legacy RAID ROM, save the settings and exit BIOS Setup. Refer to "C-2" for more information.



The BIOS Setup menus described in this section may differ from the exact settings for your motherboard. The actual BIOS Setup menu options you will see shall depend on the motherboard you have and the BIOS version.

C-1. UEFI RAID Configuration

Only Windows 8.1/8 64-bit supports UEFI RAID configuration.

To configure UEFI RAID, you need to prepare a USB flash drive using FAT 32 file format and copy all files (including the UEFI RAID utility rcadm.efi) in the \BootDrv\UEFI RAID Utility folder in your motherboard driver disk to the flash drive. Then follow the steps below.

Steps:

In BIOS Setup, go to **BIOS Features** and set **Windows 8 Features** to **Windows 8** and **CSM Support** to **Never**. Save the changes and exit BIOS Setup.

Running the UEFI RAID Utility

Restart your computer and press <F12> to enter the boot device configuration menu. Use the up or down arrow key to select your USB flash drive which is prefixed with "UEFI:" string. Then press <Enter> to access the screen as shown in Figure 3. To run the UEFI RAID utility, enter the following commands.

You can enter the commands at **Shell** or **fsx**: level (**x** represents the disk number for your USB flash drive).

Checking Disk Information

To see the hard drive information, enter the following commands and press <Enter>. You will see **CONTROLLER LIST** and **DISK LIST** displayed on the screen.

```
rcadm -M -qa
```

Creating a RAID Array

To create a RAID array, refer to the following examples to enter the commands and press <Enter>. When succeeded, the message which says "created successfully" will appear.

Example 1: Create a RAID 0 array with Drive 0 and Drive 1 and the array size is 40 GB.

```
rcadm -C -r0 -d 0 1 -s 40000
```

("C"=Create a array, "r0"=RAID 0, d 0 1=Drive 0 and Drive 1, "s 40000"=Size of 40 GB; to use the maximum size allowed, do not enter "s x0000")

Example 2: Create a RAID 5 array with Drive 1~4 and the array size is 75 GB.

```
rcadm -C -r5 -d 1 2 3 4 -s 75000
```

("C"=Create a array, "r5"=RAID 5, d 1 2 3 4=Drive 1~4, "s 75000"=Size of 75 GB)

After you create the array, you can enter the "**rcadm -M -qa**" commands to see the array information. In addition to the **CONTROLLER LIST** and **DISK LIST** information, you will see **ARRAY LIST** information displayed on the screen, too.

Deleting an Array

To delete an array, enter the following commands and press <Enter>.

```
rcadm -D -a 1
```

("D"=Delete a array, "a 1"=Array 1, to delete all arrays, enter "a *")

When prompted to confirm, enter **YES** to delete or **NO** to cancel, and then press <Enter>.

To exit the UEFI RAID utility, enter "exit" and press <Enter>.

C-2. Configuring Legacy RAID ROM

Enter the legacy RAID BIOS setup utility to configure a RAID array. Skip this step and proceed with the installation of Windows operating system for a non-RAID configuration.

Steps:

After the POST memory test begins and before the operating system boot begins, look for a message which says "Press <Ctrl-F> to enter RAID Option ROM Utility". Press <Ctrl> + <R> to enter the RAID BIOS setup utility.

Creating a RAID Array

1. **To create a new array, press <Enter> on the Create Array option.**
2. The selection bar will move to the **Disks** section on the right of the screen. Select the hard drives to be included in the RAID array. Use the up or down arrow key to select a hard drive and press <Insert>. The selected hard drive will be shown in green. To use all of the hard drives, simply press <A> to select all. Then press <Enter> and the selection bar will move to the **User Input** section on the left bottom of the screen. (Figure 10)
3. First, select a RAID mode and press <Enter>. The selections available depend on the number of the hard drives being installed. Then follow the on-screen instructions to specify the array size. You can select All available space to use the maximum size allowed or use the up or down arrow key to adjust the size and press <Enter>.
4. Select a caching mode. Options include Read/Write, Read Only, and None. Then press <Enter> to proceed.
5. Finally, a message which says "Confirm Creation of Array" will appear. Press <C> to confirm or <Esc> to return to the previous screen. To exit the RAID BIOS utility, press <Esc> and then press <C> to confirm.

Deleting an Array

The **Delete Array(s)** menu option allows for deletion of disk array assignments.

1. Select **Delete Array(s)** in the **Main Menu** and press <Enter>.
2. In the **Arrays** section, press the <Insert> key on the array you want to delete and then press <Enter> to proceed.
3. When prompted to confirm, press <C> to continue the deletion or <Esc> to cancel.

Installing the SATA RAID/AHCI Driver and Operating System

With the correct BIOS settings, you are ready to install the operating system.
(The following instructions use Windows 8.1 as the example operating system.)

Step 1:

You need to install the SATA RAID/AHCI driver during the OS installation. Use an alternative system to copy the SATA RAID/AHCI driver from the motherboard driver disk to a USB flash drive. Copy the **Hw8_A88** folder under **BootDrv** in the driver disk.

Step 2:

Boot from the Windows 8.1 setup disk and perform standard OS installation steps. When the screen requesting you to load the driver appears, select **Browse**.

Step 3:

Then browse to the USB flash drive and select the location of the driver. The locations of the drivers are as follows:

RAID driver for Windows 8.1/8 32-bit: Hw8_A88\RAID\x86

RAID driver for Windows 8.1/8 64-bit: Hw8_A88\RAID\x64

AHCI driver for Windows 8.1/8 32-bit: Hw8_A88\AHCI\W8

AHCI driver for Windows 8.1/8 64-bit: Hw8_A88\AHCI\W864A

For Windows 7, browse to the **Hw7_A88** folder.

Step 4:

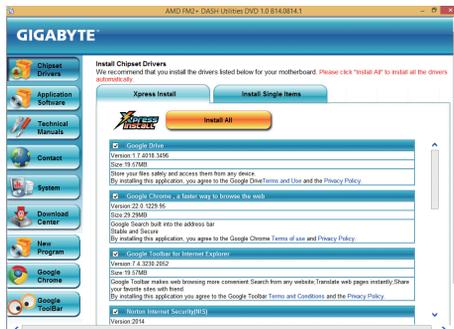
When a screen appears, select **AMD-RAID Controller** and click **Next** to load the driver and continue the OS installation.

3-2 Drivers Installation



- Before installing the drivers, first install the operating system. (The following instructions use Windows 8.1 as the example operating system.)
- After installing the operating system, insert the motherboard driver disk into your optical drive. Click on the message "Tap to choose what happens with this disc" on the top-right corner of the screen and select "Run Run.exe." (Or go to My Computer, double-click the optical drive and execute the **Run.exe** program.)

After inserting the driver disk, "Xpress Install" will automatically scan your system and then list all the drivers that are recommended to install. You can click the **Install All** button and "Xpress Install" will install all the recommended drivers. Or click **Install Single** Items to manually select the drivers you wish to install.



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For more information about where you can drop off your waste equipment for recycling, please contact your local government office, your household waste disposal service or where you purchased the product for details of environmentally safe recycling.

- ◆ When your electrical or electronic equipment is no longer useful to you, "take it back" to your local or regional waste collection administration for recycling.
- ◆ If you need further assistance in recycling, reusing in your "end of life" product, you may contact us at the Customer Care number listed in your product's user's manual and we will be glad to help you with your effort.

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- ◆ Reorient or relocate the receiving antenna.
- ◆ Increase the separation between the equipment and receiver.
- ◆ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ◆ Consult a dealer or experienced TV/radio technician for help.

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- ◆ This Class B digital apparatus complies with Canadian ICES-003 and RSS-210.
- ◆ Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.
- ◆ Cet appareil numérique de classe B est conforme aux normes canadiennes ICES-003 et RSS-210.
- ◆ Son fonctionnement est soumis aux deux conditions suivantes : (1) cet appareil ne doit pas causer d'interférence et (2) cet appareil doit accepter toute interférence, notamment les interférences qui peuvent affecter son fonctionnement.



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