ELITEGROUP

Z270-LIGHTSABER

USER GUIDE

Version:1.0

40-012-KY7100

ISO-9001 ISO-14001

Copyright

Version 1.0

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Federal Communications Commission (FCC)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

Shielded interconnect cables and a shielded AC power cable must be employed with this equipment to ensure compliance with the pertinent RF emission limits governing this device. Changes or modifications not expressly approved by the system's manufacturer could void the user's authority to operate the equipment.

Declaration of Conformity

This device complies with part 15 of the FCC rules. Operation is subject to the following conditions:

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

This device is in conformity with the following EC/EMC directives:

- ❑ **EN 55032** Electromagnetic compatibility of multimedia equipment - Emission requirements
- ❑ **EN 61000-3-2** Electromagnetic Compatibility(EMC)
  Part 3-2: Limits-Limits for harmonic current emissions (equipment input current ⩽16A per phase)
- ❑ **EN 61000-3-3** Electromagnetic Compatibility(EMC)
  Part 3-3: Limits-Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current⩽16A per phase and not subject to conditional connection
- ❑ **EN 55024** Information technology equipment-Immunity characteristics-Limits and methods of measurement
- ❑ **EN 60950** Safety for information technology equipment including electrical business equipment
- ❑ **CE marking** CE

Canadian Department of Communications

This class B digital apparatus meets all requirements of the Canadian Interference-causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Réglement sur le matériel brouilieur du Canada.

About the Manual

The manual consists of the following:

Memo

TABLE OF CONTENTS

Chapter 1
Introducing the Motherboard

Introduction

Thank you for choosing the **Z270-LIGHTSABER** motherboard. This motherboard is a high performance, enhanced function motherboard designed to support the LGA1151 socket for Intel® Kaby Lake/Skylake processor.

This motherboard is based on **Intel® Z270 Express Chipset** for best desktop platform solution. It supports up to **64 GB** of system memory with dual channel DDR4 **3200+(OC)/2133** MHz. High resolution graphics via three PCIe x16 Gen3 slots. It supports **3-way AMD CrossfireX™** technology that allows you to install Multi graphic cards with identical GPU running at PCIe Gen3 speed. In additon, four PICe x1 Gen 3 slots are for extending usage.

It integrates USB 2.0, USB 3.0 and USB 3.1 interface, supporting up to seven USB 2.0 ports (four USB 2.0 ports at rear panel and one 2*5 pin USB 2.0 header supports additional two USB 2.0 ports and one 5 pin USB 2.0 header supports additional one USB 2.0 port) and six USB 3.0 ports (four USB 3.0 ports at the rear panel and one USB 3.0 header supports additional two USB 3.0 ports) and two USB 3.1 ports at the rear panel. The Front USB 3.0 header provides EZ charger technology, please refer to Front Panel USB 3.0 headers of chapter 2 for more details.

The motherboard is equipped with advanced full set of I/O ports in the rear panel, including PS/2 keyboard and mouse combo connector, one CLR_CMOS button, one Optical SPDIF out port, one HDMI 1.4b port, one Display port, two USB 3.1 ports, four USB 3.0 ports, four USB 2.0 ports (the yellow ports only used for game USB 2.0 keyboard and mouse, while the red ports only used for rezound vigor USB 2.0 device), one RJ45 LAN connector and 8-ch audio jacks.

In addition, this motherboard supports six SATA 6Gb/s connectors for expansion.

Package Contents

Your motherboard package ships with the following items:

- ❑ Z270-LIGHTSABER Motherboard
- ❑ Quick Installation Guide
- ❑ User Manual
- ❑ DVD
- ❑ I/O Shield
- ❑ 4 SATA 6Gb/s cable

The package contents above are for reference only, please take the actual package items as standard.

Specifications

CPU	• LGA1151 socket for Intel® Kaby Lake/Skylake processor • Supports max CPU TDP 95W and MB TDP designs up to 280W *Note: Please go to ECS website for the latest CPU support list.*
Chipset	• Intel® Z270 Chipset
Extra Chip	• Asmedia ASM1061 & Asmedia ASM1142
Memory	• Dual-channel DDR4 memory architecture • 4 x 288-pin DDR4 DIMM sockets support up to 64 GB • Supports DDR4 3200+(OC)/2133 MHz SDRAM *Note: Please go to ECS website for the latest Memory support list.*
Expansion Slots	• 3 x PCI Express x16 Gen3 slots* • 4 x PCI Express x4 Gen3 slots • 1 x M.2 Socket 3 with M key, supports type 2242/2260/2280 storage devices (both PCIE & SATA mode) *Note:* **1. Please insert your PCIe Card (VGA card) on gray PCIEX16 slot (PCIEX16_1) when you use one PCIe Card (VGA card), please referer to Chapter 2-3-4.* *2. If inserting two PCIe Cards (VGA card) into PCIEX16_1 and PCIEX16_2 slots, both two slots will run at X8 mode.* *3. If inserting three PCIe Cards (VGA card) into PCIEX16_1~3 slots, the PCIEX16_1 and PCIEX16_2 will run at X8 mode, while the PCIEX16_3 will run at x4 mode.*
AMDCrossFireX™ Technology	• Supports AMD CrossFireX™ Technology
Storage	• SATA3_1/2 supported by Asmedia ASM1061 Chipset • SATA3_3/4/5/6 Supported by Intel® Z270 Express Chipset • 1 x U.2 Port (PCI-e x4 only)
Audio	• Realtek ALC1150 8-Ch High Definition audio CODEC - Compliant with HD audio specification
LAN	• Killer E2500
Rear Panel I/O	• 1 x PS/2 keyboard and mouse combo connector • 1 x CLR_CMOS button • 1 x Optical SPDIF out port • 1 x HDMI 1.4b port • 1 x Display port • 2 x USB 3.1 ports • 4 x USB 3.0 ports • 4 x USB 2.0 ports* • 1 x RJ45 LAN connector • 1 x 8-ch Audio jacks *Note: *The yellow ports only used for game USB 2.0 keyboard and mouse, while the red ports only used for rezound vigor USB 2.0 device.*

Internal I/O Connectors & Headers	• 1 x 24-pin ATX Power Supply connector • 1 x 8-pin ATX 12V Power connector • 2 x 4-pin CPUFAN connectors • 2 x 4-pin SYSFAN connectors • 1 x 4-pin PWRFAN connector • 1 x 5-pin USB 2.0 header supports additional one USB 2.0 port • 1 x 2*5 pin USB 2.0 header supports additional two USB 2.0 ports • 1 x USB 3.0 header supports additional two USB 3.0 ports (supports EZ charger) • 6 x SATA 6Gb/s connectors • 1 x U.2 connector (PCIEx4 Signal only) • 1 x 80 Port switch button • 1 x Debug POST LEDs • 1 x Reset button • 1 x Power on button • 1 x ROM backup button • 1 x BIOS updat button • 1 x BIOS set button • 1 x Quick OC button • 1 x Front Panel switch/LED header • 1 x Case open header • 1 x Buzzer header • 1 x Front Panel audio header • 1 x SPIROM Switch
System BIOS	• AMI BIOS with 64Mb SPI Flash ROM • Supports Plug and Play, STR (S3)/ STD(S4), Hardware Monitor • Supports ACPI & DMI • Audio, LAN, can be disabled in BIOS • F7 hot key for boot up devices option • Supports Over-Clocking • Supports PgUp clear CMOS Hotkey (Has PS2 KB Model only) • Add the function of copying BIOS parameters to USB flash drive
Bundled Software Support	• ECS Exclusive AP: eBLU*/eDLU/eSF* *Note: *Microsoft.NET Framework 4.5 is required.*
Form Factor	• ATX Size, 305mm x 244mm

Motherboard Components

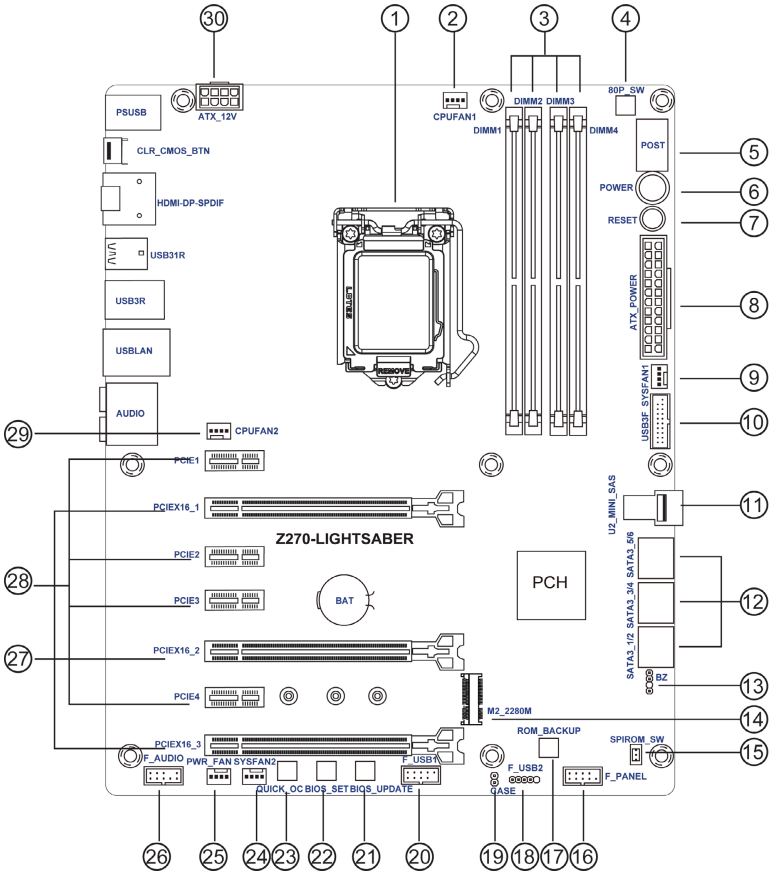
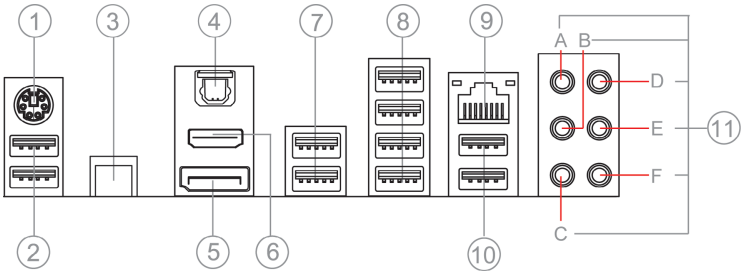


Table of Motherboard Components

LABEL	COMPONENTS
1. CPU Socket	LGA1151 socket for Intel® Kaby Lake/Skylake processor
2. CPUFAN1	4-pin CPU cooling fan connector
3. DIMM1~4	288-pin DDR4 Module slots
4. 80P_SW	80 Port switch button
5. POST	POST Code, Voltage and Temperature LED
6. POWER	Power on button
7. RESET	Reset button
8. ATX_POWER	Standard 24-pin ATX power connector
9. SYSFAN1	4-pin system cooling fan connector
10. USB3F	Front panel USB 3.0 header (supports EZ Charger)
11. U2_MINI_SAS	U.2 connector
12. SATA3_1~6	Serial ATA 6Gb/s connectors
13. BZ	Buzzer header
14. M2_2280M	M.2 M.2 Socket 3 with M key, supports type 2242/2260/2280 storage devices (both PCIE & SATA mode)
15. SPIROM_SW	SPIROM switch
15. F_PANEL	Front panel switch/LED header
17. ROM_BACKUP	ROM backup button
18. F_USB2	5-pin front panel USB 2.0 header
19. CASE	CASE open header
20. F_USB1	2*5 pin front panel USB 2.0 header
21. BIOS_UPDATE	BIOS update button
22. BIOS_SET	BIOS set button
23. QUICK_OC	Quick OC button
24. SYSFAN2	4-pin system cooling fan connector
25. PWR_FAN	4-pin Power cooling fan connector
26. F_AUDIO	Front panel audio header
27. PCIEX16_1~3	PCI Express x16 Gen3 slots for graphics interface
28. PCIE1~4	PCI Express x1 Gen3 slots
29. CPUFAN2	4-pin CPU cooling fan connector
30. ATX_12V	8-pin +12V power connector

I/O Ports



1. PS/2 Keyboard & Mouse Combo connector
Use the PS/2 port to connect a PS/2 Keyboard or Mouse.

2. USB 2.0 Ports (Yellow)
This two USB 2.0 ports are only used to connect game keyboard and mouse.

3. CLR_CMOS_BTN
Use the CLR_CMOS button to clear CMOS.

4. Optical SPDIF Out port
This jack connects to external optical digital audio out devices.

5. DP Port
Connect your monitor to the DP port.

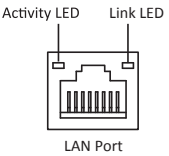
6. HDMI 1.4b Port
You can connect the display device to the HDMI 1.4b port.

7. USB 3.1 Ports
Use the USB 3.1 ports to connect USB 3.1 devices.

8. USB 3.0 Ports
Use the USB 3.0 ports to connect USB 3.0 devices.

9. LAN Port
Connect an RJ-45 jack to the LAN port to connect your computer to the Network.

LAN LED	Status	Description
Activity LED	OFF	No data
	Green blinking	Active
Link LED	OFF	No link
	Green	Link



10. USB 2.0 Ports (Red)
This two USB 2.0 ports are only used for rezound vigor USB 2.0 device.

11. Audio ports
Use the audio jacks to connect audio devices. The D port is for stereo line-in signal, while the F port is for microphone in signal. This motherboard supports 8-channel audio devices that correspond to the A, B, C and E port respectively. In addition, all of the 3 ports, B, C and E provide users with both right & left channels individually. Users please refer to the following note for specific port function definition.

A: Center & Woofer	D: Line-in
B: Back Surround	E: Front Out
C: Side Surround	F: Mic

The above port definition can be changed to audio input or audio output by changing the driver utility setting.

Table of onboard Buttons

Item name	PCB mark	Function
EZ LED Display	80P_SW	When this button collocates with the 7-segment display on the MB, it will display the following information about the MB, and it will switchover in the following order. 1. POST_CODE 2. CPU_VOLTAGE (V) 3. DIMM_VOLTAGE (V) 4. CPU_TEMP (℃) 5. PCH_TEMP (℃)
EZ Quick OC	QUICK_OC	Your computer will process the fast OverClocking automatically after pressing this button under OS and rebooting the computer.
EZ Enter BIOS	BIOS_SET	Under OS or DOS, after pressing this button, your computer will directly enter the BIOS setup picture when you reboot or turn on your computer next time.
EZ Update BIOS	BIOS_UPDATE	Store the BIOS in USB Flash Drive (ex:60216iG.ROM), and change the file name to EBOOT.ROM, then when you reboot your computer, the BIOS will be updated after pressing this button under OS with the USB Flash Drive connected to the computer.
EZ Duo BIOS	ROM_BACKUP	When the SPIROM_A used for booting is damaged: 1. Disconnect AC PWR for more than 30s and push the SPIROM_SW to side B, then connect AC PWR, if the ROM_LED remains on, it shows that SPIROM_B is selected. Boot the computer to enter BIOS Disable Eup Function, the computer will reboot automatically after saving the setup, then press the POWER button to turn off the computer. And then press ROM_BACKUP for more than 4s, if ROM_LED blinks continually, it shows that F75223 is backuping the file from SPIROM_B into SPIROM_A. Backup is finished if ROM_LED returns to remain on after 30s. 2. Disconnect AC for more than 30s, then push SPIROM_SW to side A, system will return to default state.

Item name	PCB mark	Function
EZ SPIROM Switch	SPIROM_SW	SPIROM_A: Default BIOS SPIROM_B: Backup BIOS BIOS Backup: 1. Disconnect AC PWR for more than 30s and push the SPIROM_SW to side B, then connect AC PWR, if the ROM_LED remains on, it shows that SPIROM_B is selected. Boot the computer to enter BIOS Disable Eup Function, the computer will reboot automatically after saving the setup, then press the POWER button to turn off the computer. And then press ROM_BACKUP for more than 4s, if ROM_LED blinks continually, it shows that F75223 is backuping the file from SPIROM_B into SPIROM_A. Backup is finished if ROM_LED returns to remain on after 30s. 2. Disconnect AC for more than 30s, then push SPIROM_SW to side A, system will return to default state. BIOS Update: 1. Update SPIROM_A: ensure that SPIROM_SW is on the side A after disconnecting AC for more than 30s, then connect AC PWR, boot the computer to enter BIOS Disable Eup Function, Disable ME Control, the computer will reboot automatically after saving the setup, then update BIOS according to normal process. 2. Update SPIROM_B: ensure that SPIROM_SW is on the side B after disconnecting AC for more than 30s, then connect AC PWR, boot the computer to enter BIOS Disable Eup Function, Disable ME Control, the computer will reboot automatically after saving the setup, then update BIOS according to normal process. Confirmation of SPIROM_A and SPIROM_B BIOS version: Ensure that SPIROM_SW is on the side A/B after disconnecting AC for more than 30s, and press CLR_CMOS_BTN button, then to confirm it after booting the computer.
EZ RESET	RESET	Your computer will fast reset after pressing this button.
EZ POWER	POWER	This is power button.
EZ Clear CMOS	CLR_CMOS_BTN	This button is used to clear CMOS. Please perform this operation after disconnecting the AC PWR for more than 30s.

Chapter 2
Installing the Motherboard

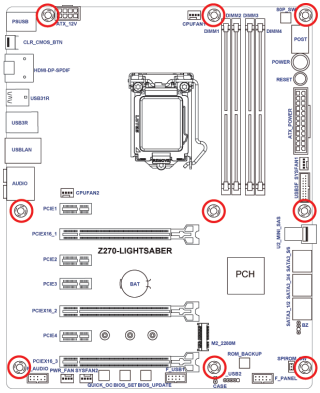
2-1. Safety Precautions

Follow these safety precautions when installing the motherboard:

- Wear a grounding strap attached to a grounded device to avoid damage from static electricity.
- Discharge static electricity by touching the metal case of a safely grounded object before working on the motherboard.
- Leave components in the static-proof bags.
- Always remove the AC power by unplugging the power cord from the power outlet before installing or removing the motherboard or other hardware components.

2-2. Installing the motherboard in a Chassis

This motherboard carries an ATX form factor of 305 x 244 mm. Choose a chassis that accommodates this form factor. Make sure that the I/O template in the chassis matches the I/O ports installed on the rear edge of the motherboard. Most system chassis have mounting brackets installed in the chassis, which corresponds to the holes in the motherboard. Place the motherboard over the mounting brackets and secure the motherboard onto the mounting brackets with screws.



Do not over-tighten the screws as this can stress the motherboard.

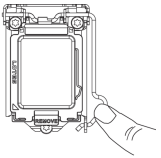
When installing 24-pin ATX power cable, please note the overhead space because of the chassis design of the Motherboard, avoiding to damage the motherboard with excessive power.

2-3. Installing Hardware

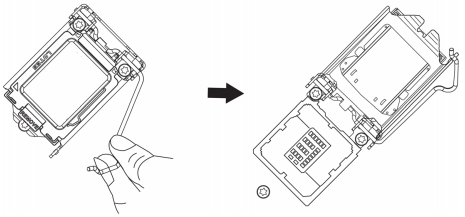
2-3-1. Installing the Processor

- This motherboard has an LGA1151 socket.
- When choosing a processor, consider the performance requirements of the system. Performance is based on the processor design, the clock speed and system bus frequency of the processor, and the quantity of internal cache memory and external cache memory.
- You may be able to change the settings in the system Setup Utility. We strongly recommend you do not over-clock processor or other components to run faster than their rated speed.
- The following illustration shows CPU installation components.

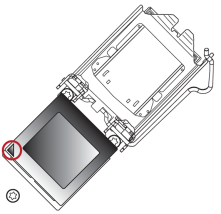
A. Press the hook of lever down with your thumb and pull it to the right side to release it from retention tab.



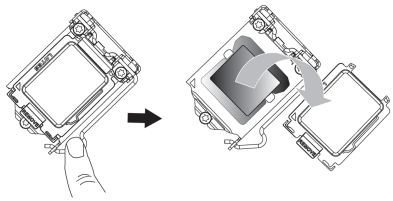
B. Lift the tail of the load lever and rotate the load plate to fully open position.



C. Grasp the edge of the package substrate. Make sure pin 1 indicator is on your bottom-left side. Aim at the socket and place the package carefully into the socket by purely vertical motion.



D. Rotate the load plate onto the package IHS (Intergraded Heat Spreader). Engage the load lever while pressing down lightly onto the load plate. Secure the load lever with the hook under retention tab. Then the cover will flick automatically.

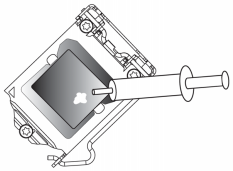


Please save and replace the cover onto the CPU socket if processor is removed.

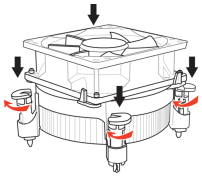
2-3-2. Installing the CPU Cooler

- Install the cooling fan in a well-lit work area so that you can clearly see the motherboard and processor socket.
- Avoid using cooling fans with sharp edges in case the fan casing and the clips cause serious damage to the motherboard or its components.
- To achieve better airflow rates and heat dissipation, we suggest that you use a high quality fan with 3800 rpm at least. CPU fan and heat sink installation procedures may vary with the type of CPU fan/heatsink supplied. The form and size of fan/heatsink may also vary.
- DO NOT remove the CPU cap from the socket before installing a CPU.
- Return Material Authorization (RMA) requests will be accepted only if the motherboard comes with the cap on the LGA1151 socket.
- The following illustration shows how to install CPU fan.

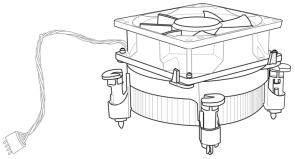
A. Apply some thermal grease onto the contacted area between the heatsink and the CPU, and make it to be a thin layer.



B. Fasten the cooling fan supporting base onto the CPU socket on the motherboard. And make sure the CPU fan is plugged to the CPU fan connector.



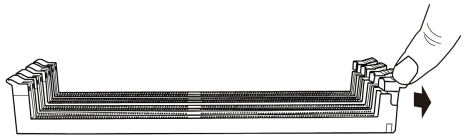
C. Connect the CPU cooler power connector to the CPU_FAN connector.



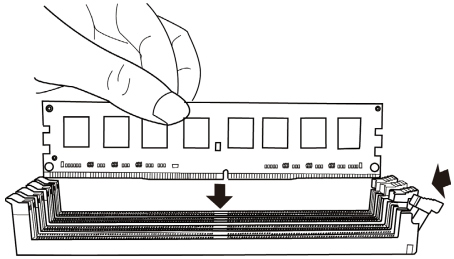
2-3-3. Installing Memory Modules

- This motherboard accommodates four memory modules. It can support four 288-pin DDR4 3200+(OC)/2133 MHz.
- Do not remove any memory module from its antistatic packaging until you are ready to install it on the motherboard. Handle the modules only by their edges. Do not touch the components or metal parts. Always wear a grounding strap when you handle the modules.
- You must install at least one module in any of the four slots. Total memory capacity is 64 GB.
- Refer to the following to install the memory modules.

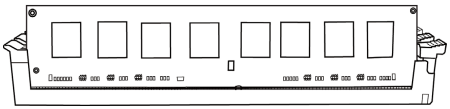
A. Push the latche on the mobilizable side of the DIMM slot down.



B. Install the DIMM module into the slot and press it firmly down until it seats correctly. Check that the cutouts on the DIMM module edge connector match the notches in the DIMM slot.



C. The slot latche is levered upwards and latch on to the edges of the DIMM.



The four DDR4 memory sockets (DIMM1, DIMM2, DIMM3 and DIMM4) are divided into two channels and each channel has two memory sockets as following:

Channel A: DIMM1, DIMM2

Channel B: DIMM3, DIMM4

Recommend memory configuration

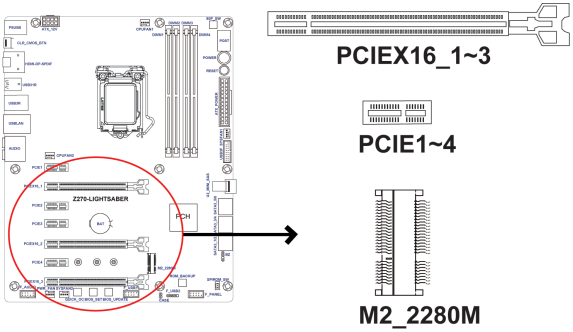
Model	Sockets			
	DIMM1	DIMM2	DIMM3	DIMM4
1 DIMM	~	Populated	~	~
1 DIMM	~	~	~	Populated
2 DIMMs	~	Populated	~	Populated
3 DIMMs	Populated	Populated	~	Populated
3 DIMMs	~	Populated	Populated	Populated
4 DIMMs	Populated	Populated	Populated	Populated

Due to Intel CPU spec definition, please follow the table above for recommended memory configuration.

1. For best performance and compatibility, we recommend that users give priority to the DIMMs (DIMM2/DIMM4) when installing DIMMs.
2. We suggest users not to mix memory type. It is recommended to use the same brand and type memory on this motherboard.

2-3-4. Installing Add-on Cards

The slots on this motherboard are designed to hold expansion cards and connect them to the system bus. Expansion slots are a means of adding or enhancing the motherboard's features and capabilities. With these efficient facilities, you can increase the motherboard's capabilities by adding hardware that performs tasks that are not part of the basic system.



PCIEX16_1~3 Slots* The PCI Express x16 slots are used to install an external PCI Express graphics card that is fully compliant to the PCI Express Base Specification revision 3.0.

PCIE1~4 Slots The PCI Express x1 slots are fully compliant to the PCI Express Base Specification revision 3.0.

M2_2280M Slot The M2_2280M slot is M.2 Socket 3 with M key, supports type 2242/2260/2280 storage devices (both PCIE & SATA mode). It will provide high transfer performance than original SATA interface.

**1. Please insert your PCIe Card (VGA card) on gray PCIEX16 slot (PCIEX16_1) when you use one PCIe Card (VGA card), please referer to Chapter 2-3-4.*

2. If inserting two PCIe Cards (VGA card) into PCIEX16_1 and PCIEX16_2 slots, both two slots will run at X8 mode.

3. If inserting three PCIe Cards (VGA card) into PCIEX16_1~3 slots, the PCIEX16_1 and PCIEX16_2 will run at X8 mode, while the PCIEX16_3 will run at x4 mode.

Before installing an add-on card, check the documentation for the card carefully. If the card is not Plug and Play, you may have to manually configure the card before installation.

Recommend add_on card configuration

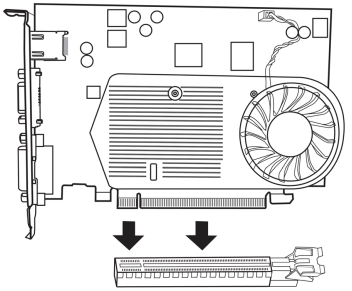
VGA configuration	PCI Express operating mode		
	PCIe 3.0 x16_1 (gray)	PCIe 3.0 x16_2	PCIe 3.0 x16_3
Single VGA/PCIe card	x16 (Recommended for single VGA card)	N/A	N/A
Dual VGA/PCIe cards	x8	x8	N/A
Triple VGA/PCIe cards	x8	x8	x4

Follow these instructions to install an add-on card:

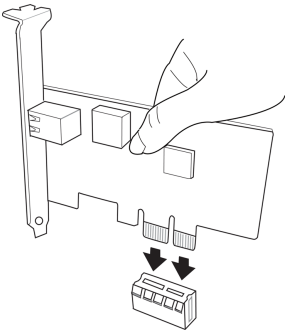
1 Remove a blanking plate from the system case corresponding to the slot you are going to use.
2 Install the edge connector of the add-on card into the expansion slot. Ensure that the edge connector is correctly seated in the slot.
3 Secure the metal bracket of the card to the system case with a screw.

For some add-on cards, for example graphics adapters and network adapters, you have to install drivers and software before you can begin using the add-on card.

Please refer the following illustrations to install the add-on card:



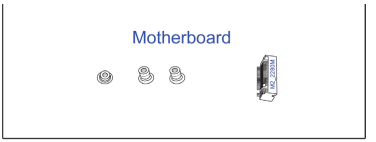
Install the VGA Card in the PCIEX16 slot



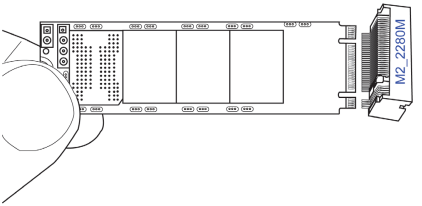
Install the LAN Card in the PCIEX1 slot

Please refer the following steps to install the M.2 SSD card:

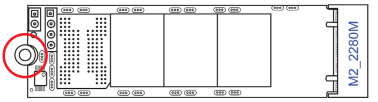
1 Demount the screw not used according to the length of your M.2 SSD card.



2 Insert the M.2 SSD card into M2_2208M slot in the fool-proof way.

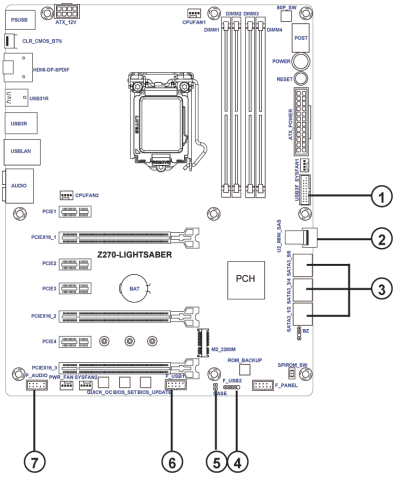


3 Lock the screw as the following picture shows to make sure the M.2 SSD card is installed in place.



2-3-5. Connecting Optional Devices

Refer to the following for information on connecting the motherboard's optional devices:

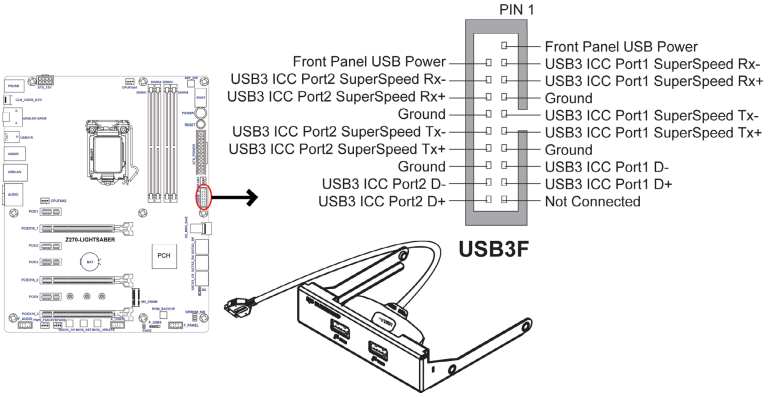


No.	Components	No.	Components
1	USB3F	5	CASE
2	U2_MINI_SAS	6	F_USB1
3	SATA3_1~6	7	F_AUDIO
4	F_USB2	--	--

1. USB3F: Front Panel USB 3.0 Header (supports EZ Charger)

This Motherboard implements one USB 3.0 header supporting 2 extra front USB 3.0 ports, which delivers 5Gb/s transfer rate.

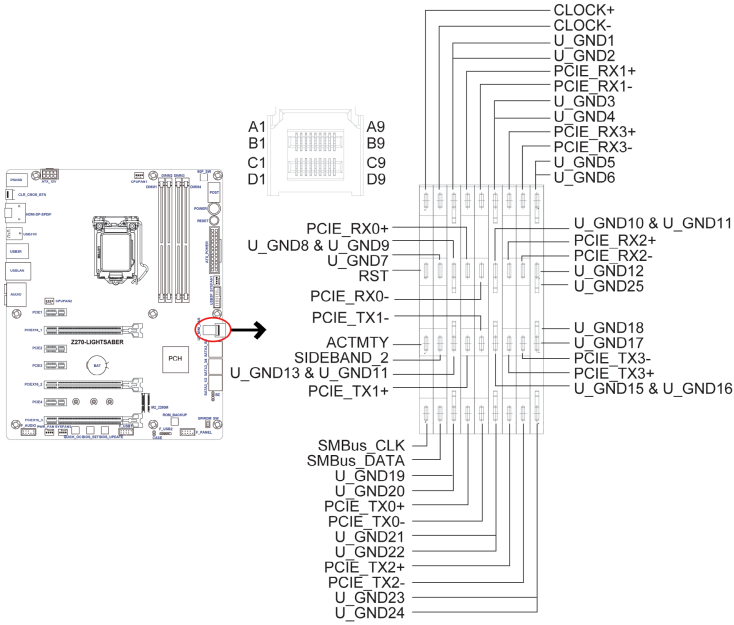
USB3F supports EZ Charger technology, provides 3 times current than general USB 3.0 port in off mode for USB 3.0 devices. It is useful and excellent, especially for the iPhone, iPad and iPod touch devices that need a large amount of current for faster recharging within less time.



Please make sure that the USB cable has the same pin assignment as indicated above. A different pin assignment may cause damage or system hang-up.

2. U2_MINI_SAS: U2 Connector

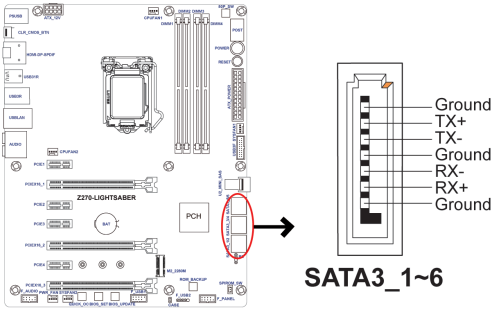
This connector is used to support the SSD device.



U2_MINI_SAS

3. SATA3_1~6: Serial ATA 6GB/s Connectors

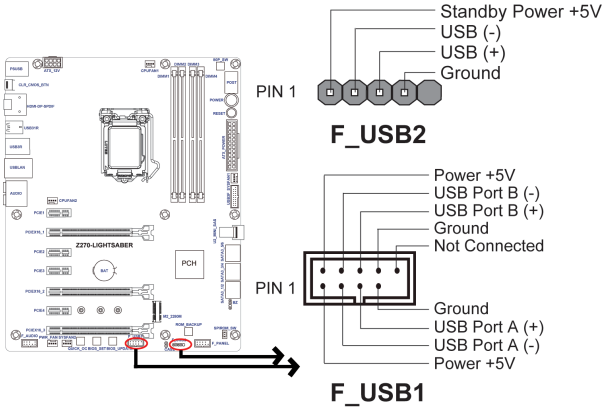
SATA3_1~6 connectors are used to support the Serial ATA 6Gb/s device, simpler disk drive cabling and easier PC assembly.



SATA3_1~6

4. F_USB2: 5 pin Front Panel USB 2.0 Header & 6. F_USB1: 2*5 pin Front Panel USB 2.0 Headers

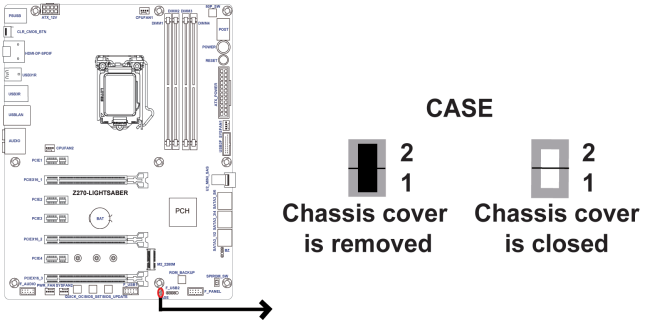
The motherboard has two USB 2.0 headers(one 5 pin USB2.0 header and one 2*5 pin USB 2.0 header) supporting three USB 2.0 ports. Additionally, some computer cases have USB ports at the front of the case. If you have this kind of case, use auxiliary USB connector to connect the front-mounted ports to the motherboard.



Please make sure that the USB cable has the same pin assignment as indicated above. A different pin assignment may cause damage or system hang-up.

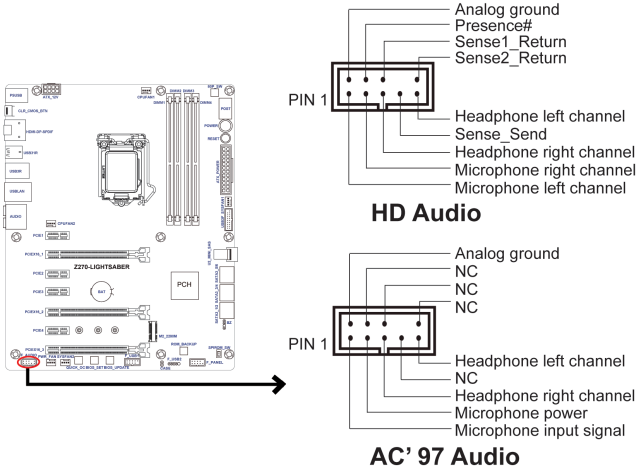
5. CASE: Chassis Intrusion Detect Header

This detects if the chassis cover has been removed. This function needs a chassis equipped with instrusion detection switch and needs to be enabled in BIOS.

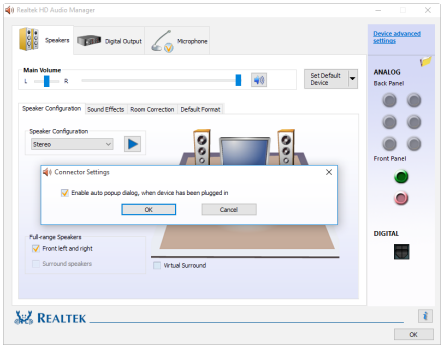


7. F_AUDIO: Front Panel Audio Header

The front panel audio header allows the user to install auxiliary front-oriented microphone and line-out ports for easier access. This header supports HD audio by default. If you want connect an AC' 97 front panel audio to HD onboard headers, please set as below picture.

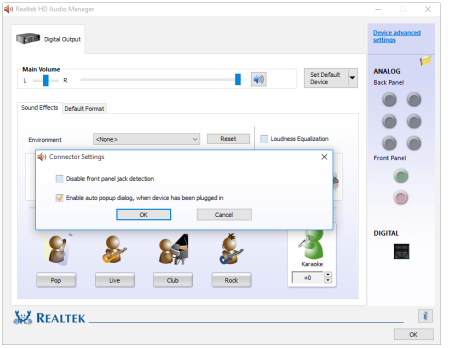


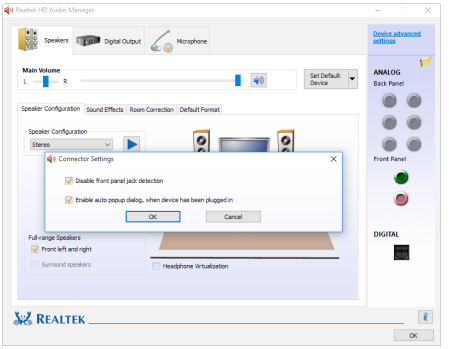
AC' 97 Audio Configuration: To enable the front panel audio connector to support AC97 Audio mode.



AC'97 Panel

If you use HD Audio Front Panel, when you tick off “Disable Front Panel Detection ”, the front right two ports will highlight, then there is no jack detection function.





HD Panel

** For reference only*

2-3-6. Installing a SATA Hard Drive

This section describes how to install a SATA Hard Drive.

About SATA Connectors

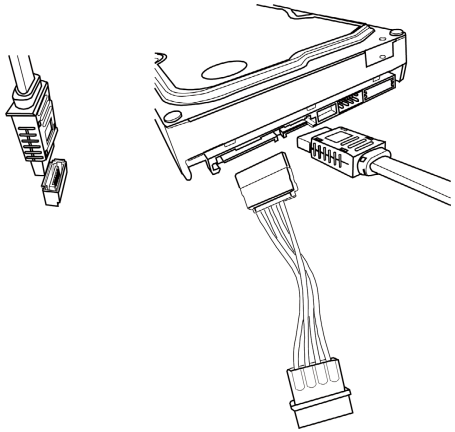
Your motherboard features six SATA connectors supporting a total of six drives. SATA refers to Serial ATA (Advanced Technology Attachment). These connectors are well designed and will only fit in one orientation. Locate the SATA connectors on the motherboard and follow the illustration below to install the SATA hard drives.

Installing Serial ATA Hard Drives

To install the Serial ATA (SATA) hard drives, use the SATA cable that supports the Serial ATA protocol. This SATA cable comes with a SATA power cable. You can connect either end of the SATA cable to the SATA hard drive or the connector on the motherboard.

Refer to the illustration below for proper installation:

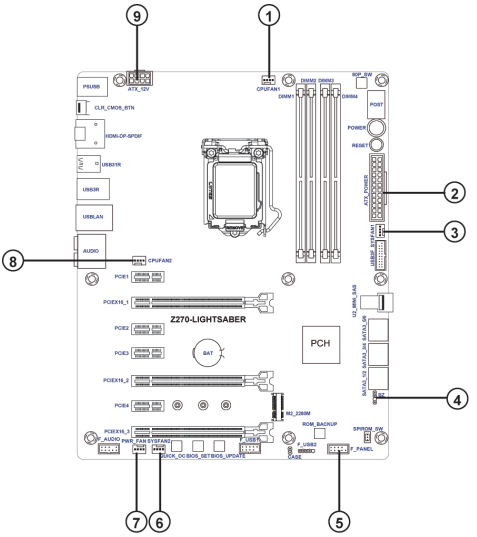
1 Attach either cable end to the connector on the motherboard.
2 Attach the other cable end to the SATA hard drive.
3 Attach the SATA power cable to the SATA hard drive and connect the other end to the power supply.



** For reference only*

2-3-7. Connecting Case Components

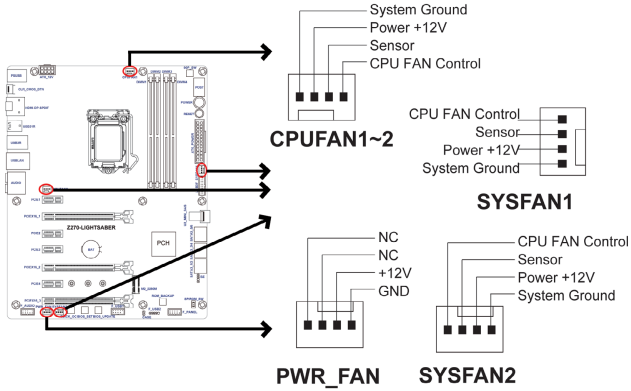
After you have installed the motherboard into a case, you can begin connecting the motherboard components. Refer to the following:



No.	Components	No.	Components
1	CPUFAN1	6	SYSFAN2
2	ATX_POWER	7	PWR_FAN
3	SYSFAN1	8	CPUFAN2
4	BZ	9	ATX_12V
5	F_PANEL	--	--

1 & 3 & 6 & 7 & 8: CPUFAN1~2 (CPU Cooling FAN Connectors) & SYSFAN1~2 (System Cooling FAN Connectors) & PWR_FAN (Power Cooling FAN Connector)

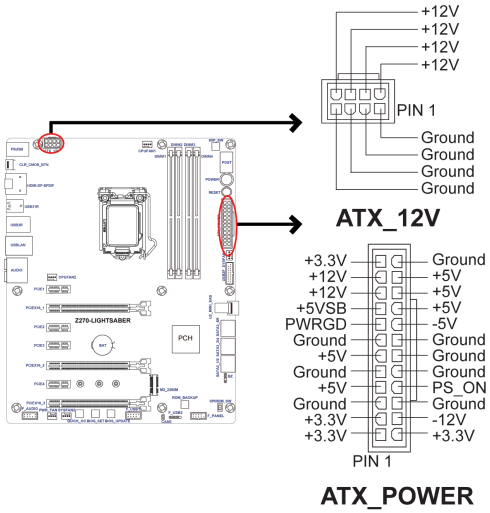
Connect the CPU cooling fan cable to **CPUFAN**.
Connect the system cooling fan connector to **SYSFAN**.
Connect the power cooling fan connector to **PWR_FAN**.



Users please note that the fan connector supports the CPU cooling fan of 1.1A ~ 2.2A (26.4W max) at +12V.

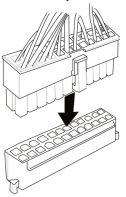
2 & 9: ATX_POWER (ATX 24-pin Power Connector) & ATX_12V (8-pin ATX 12V Power Connector)

Connect the standard power supply connector to **ATX_POWER**.
Connect the auxiliary case power supply connector to **ATX_12V**.



Connecting 24-pin power cable

The ATX 24-pin connector allows you to connect to ATX v2.x power supply.

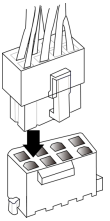


24-pin power cable

With ATX v2.x power supply, users please note that when installing 24-pin power cable, the latches of power cable and the ATX match perfectly.

Connecting 8-pin power cable

The ATX_12V power connector is used to provide power to the CPU.

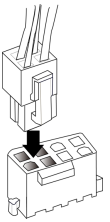


8-pin power cable

When installing 8-pin power cable, the latches of power cable and the ATX_12V match perfectly.

Connecting 4-pin power cable

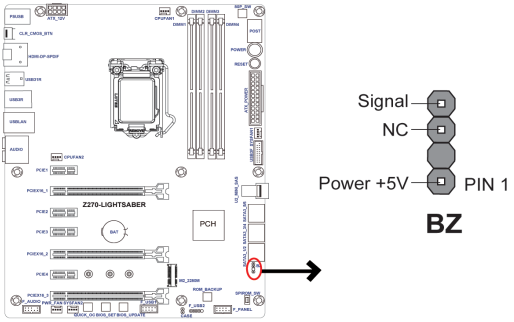
The ATX_12V power connector is used to provide power to the CPU.



4-pin power cable

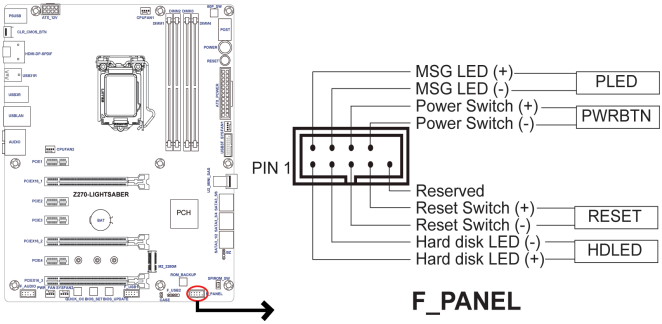
When installing 4-pin power cable, the latches of power cable and the ATX_12V match perfectly.

4. BZ: Buzzer Header



5. F_PANEL: Front Panel Header

The front panel header (F_PANEL) provides a standard set of switch and LED headers commonly found on ATX cases. Refer to the table below for information:



Hard Drive Activity LED

Connecting pins 1 and 3 to a front panel mounted LED provides visual indication that data is being read from or written to the hard drive. The LED will also show activity when M2 hard drive is transferring the data.

Power/Sleep/Message waiting LED

Connecting pins 2 and 4 to a dual-color, front panel mounted LED provides power on/off, sleep, and message waiting indication.

Reset Switch

Supporting the reset function requires connecting pin 5 and 7 to a momentary-contact switch that is normally open. When the switch is closed, the board resets and runs POST.

Power Switch

Supporting the power on/off function requires connecting pins 6 and 8 to a momentary-contact switch that is normally open. The switch should maintain contact for at least 50 ms to signal the power supply to switch on or off. The time requirement is due to internal de-bounce circuitry. After receiving a power on/off signal, at least two seconds elapses before the power supply recognizes another on/off signal.

This concludes Chapter 2. The next chapter covers the BIOS.

Chapter 3
Using BIOS

About the Setup Utility

The computer uses the latest "American Megatrends Inc. " BIOS with support for Windows Plug and Play. The CMOS chip on the motherboard contains the ROM setup instructions for configuring the motherboard BIOS.

The BIOS (Basic Input and Output System) Setup Utility displays the system's configuration status and provides you with options to set system parameters. The parameters are stored in battery-backed-up CMOS RAM that saves this information when the power is turned off. When the system is turned back on, the system is configured with the values you stored in CMOS.

The BIOS Setup Utility enables you to configure:

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

The settings made in the Setup Utility affect how the computer performs. Before using the Setup Utility, ensure that you understand the Setup Utility options.

This chapter provides explanations for Setup Utility options.

The Standard Configuration

A standard configuration has already been set in the Setup Utility. However, we recommend that you read this chapter in case you need to make any changes in the future.

This Setup Utility should be used:

- when changing the system configuration
- when a configuration error is detected and you are prompted to make changes to the Setup Utility
- when trying to resolve IRQ conflicts
- when making changes to the Power Management configuration
- when changing the password or making other changes to the Security Setup

Entering the Setup Utility

When you power on the system, BIOS enters the Power-On Self Test (POST) routines. POST is a series of built-in diagnostics performed by the BIOS. After the POST routines are completed, the following message appears:

Press DEL to enter SETUP

Press the delete key to access BIOS Setup Utility.

Resetting the Default CMOS Values

When powering on for the first time, the POST screen may show a "CMOS Settings Wrong" message. This standard message will appear following a clear CMOS data at factory by the manufacturer. You simply need to Load Default Settings to reset the default CMOS values.

Note: Changes to system hardware such as different CPU, memories, etc. may also trigger this message.

Using BIOS

When you start the Setup Utility, the main menu appears. The main menu of the Setup Utility displays a list of the options that are available. A highlight indicates which option is currently selected. Use the cursor arrow keys to move the highlight to other options. When an option is highlighted, execute the option by pressing <Enter>.

Some options lead to pop-up dialog boxes that prompt you to verify that you wish to execute that option. Other options lead to dialog boxes that prompt you for information.

Some options (marked with an icon ») lead to submenus that enable you to change the values for the option. Use the cursor arrow keys to scroll through the items in the submenu.

In this manual, default values are enclosed in parenthesis. Submenu items are denoted by an icon ».

The default BIOS setting for this motherboard apply for most conditions with optimum performance. We do not suggest users change the default values in the BIOS setup and take no responsibility to any damage caused by changing the BIOS settings.

BIOS Navigation Keys

The BIOS navigation keys are listed below:

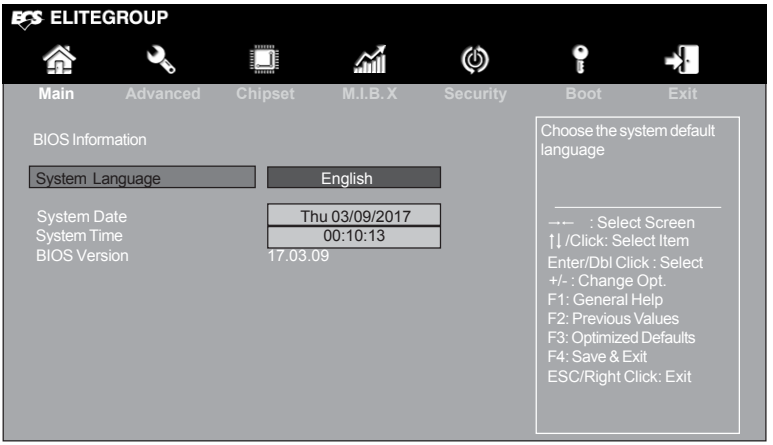
KEY	FUNCTION
ESC	Exits the current menu
↑↓→←	Scrolls through the items on a menu
+/-	Change Opt.
Enter	Select
F1	General Help
F2	Previous Value
F3	Optimized Defaults
F4	Save & Exit

1. For the purpose of better product maintenance, the manufacture reserves the right to change the BIOS items presented in this manual. The BIOS setup screens shown in this chapter are for reference only and may differ from the actual BIOS. Please visit the manufacture's website for updated manual.

2. In this Gui BIOS, you can operate by mouse or keyboard. Click : select item; Double click: enter; Right click: exit.

Main Menu

This menu shows the information of BIOS and enables you to set the system language, date and time.



System Language (English)

This item is used to set system language.

System Date & Time

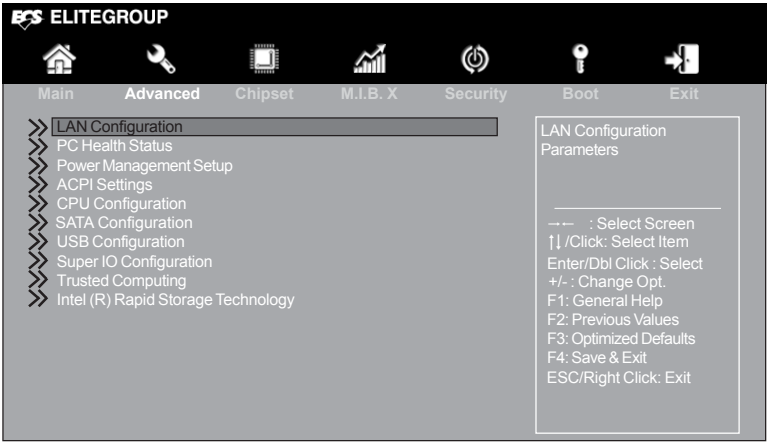
The Date and Time items show the current date and time on the computer. If you are running a Windows OS, these items are automatically updated whenever you make changes to the Windows Date and Time Properties utility.

BIOS Version (17.03.09)

This item shows the BIOS version.

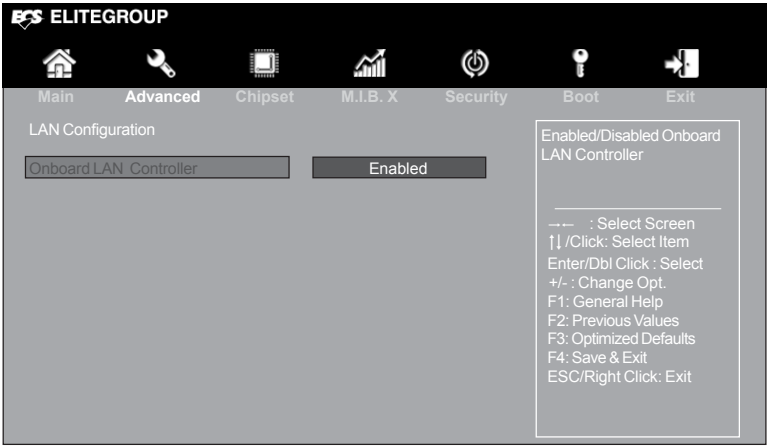
Advanced Menu

The Advanced menu items allow you to change the settings for the CPU and other system.



≫ LAN Configuration

The item in the menu shows the LAN-related information that the BIOS automatically detects.



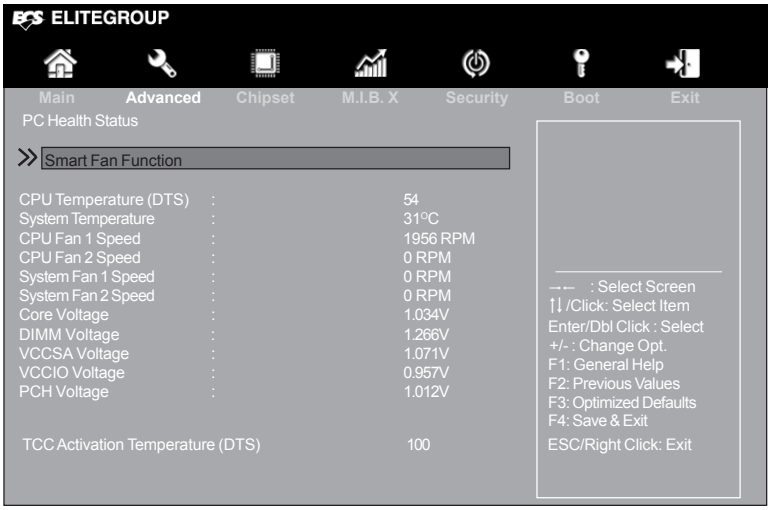
Onboard LAN Controller (Enabled)

Use this item to enable or disable Onboard LAN controller.

Press <Esc> to return to the Advanced Menu page.

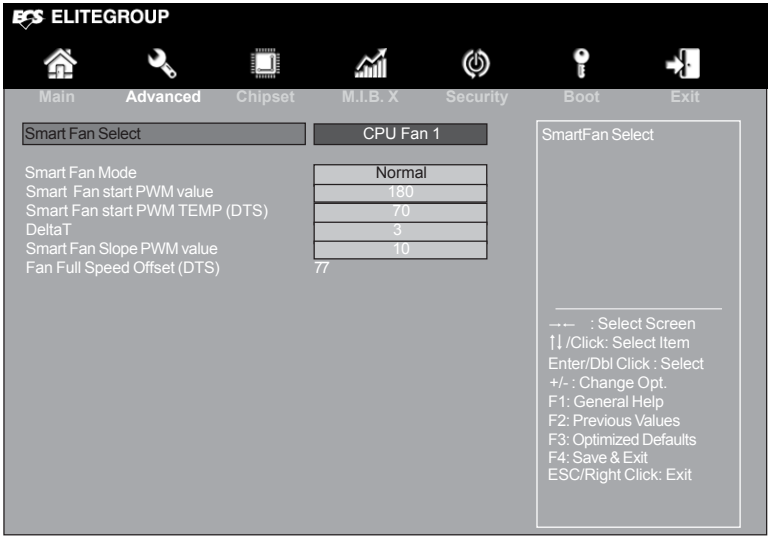
» PC Health Status

On motherboards support hardware monitoring, this item lets you monitor the parameters for critical voltages, temperatures and fan speeds.



» Smart Fan Function

Scroll to this item and press <Enter> to view the following screen:



Smart Fan Select (CPU Fan 1)

This item allows you to change and configure Smart Fans on M/B. ex. CPU Fan1, CPU Fan 2, System Fan 1.

Smart Fan Mode (Normal)

This item allows you to select the fan mode (Normal, Quiet, Silent, or Manual) for a better operation environment. If you choose Normal mode, the fan speed will be auto adjusted depending on the CPU temperature. If you choose Quite mode, the fan speed will be auto minimized for quiet environment. If you choose Silent mode, the fan speed will be auto restricted to make system more quietly. If you choose Manual mode, the fan speed will be adjust depending on users' parameters.

Smart Fan start PWM value (180)

This item is used to set the start PWM value of the smart fan.

Smart Fan start PWM TEMP (DTS) (70)

This item is used to set the start temperature of the smart fan.

DeltaT (3)

This item specifies the range that controls CPU temperature and keeps it from going so high or so low when smart fan works.

Smart Fan Slope PWM value (10)

This item is used to set the Slope Select PWM of the smart fan.

Fan Full Speed Offset (DTS) (77)

This item shows the fan full speed offset value.

Press <Esc> to return to the PC Health Status page.

System Component Characteristics

These items display the monitoring of the overall inboard hardware health events, such as CPU & DIMM voltage, CPU & System fan speed...etc.

- CPU Temperature (DTS)
- System Temperature
- CPU Fan 1 Speed
- CPU Fan 2 Speed
- System Fan 1 Speed
- System Fan 2 Speed
- Core Voltage
- DIMM Voltage
- VCCSA Voltage
- VCCIO Voltage
- PCH Voltage

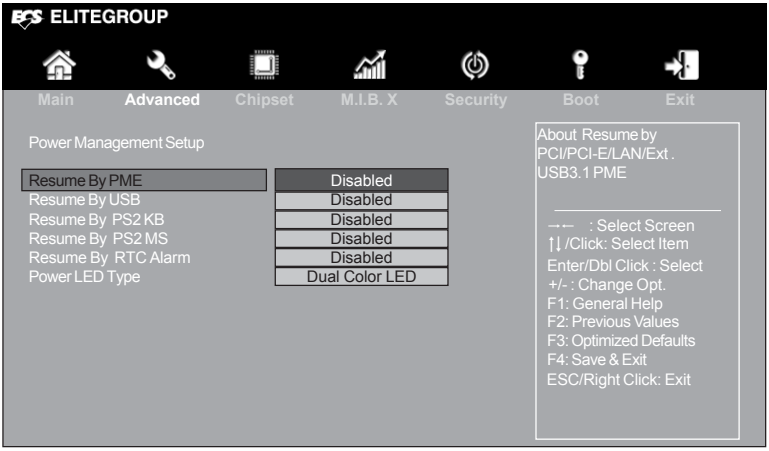
Press <Esc> to return to the Advanced Menu page.

TCC Activation Temperature (DTS) (100)

This item shows the factory TCC activation temperature.

≫ Power Management Setup

This page sets up some parameters for system power management operation.



Resume By PME (Disabled)

The system can be turned off with a software command. If you enable this item, the system can automatically resume if there is an incoming call on the PCI/PCI-E Modem or PCI/PCI-E LAN card. You must use an ATX power supply in order to use this feature. Use this item to do wake-up action if inserting the PCI/PCI-E card.

Resume By USB (Disabled)

This item allows you to enable or disable the USB device wakeup function from S3 mode.

Resume By PS2 KB (Disabled)

This item allows you to enable or disable the keyboard activity to awaken the system from power saving mode.

Resume By PS2 MS (Disabled)

This item allows you to enable or disable the mouse activity to awaken the system from power saving mode.

Resume By RTC Alarm (Disabled)

The system can be turned off with a software command. If you enable this item, the system can automatically resume at a fixed time based on the system's RTC (realtimeclock). Use the items below this one to set the date and time of the wake-up alarm. You must use an ATX power supply in order to use this feature.

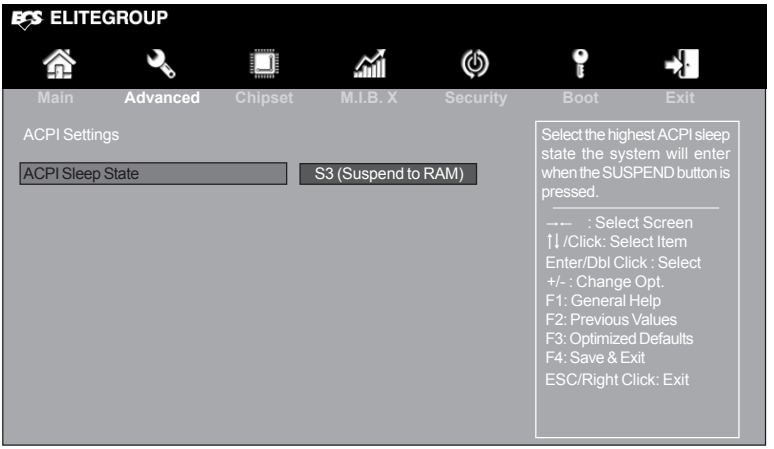
Power LED Type (Dual Color LED)

This item shows the type of the Power LED.

Press <Esc> to return to the Advanced Menu page.

≫ ACPI Settings

The item in the menu shows the highest ACPI sleep state when the system enters suspend.



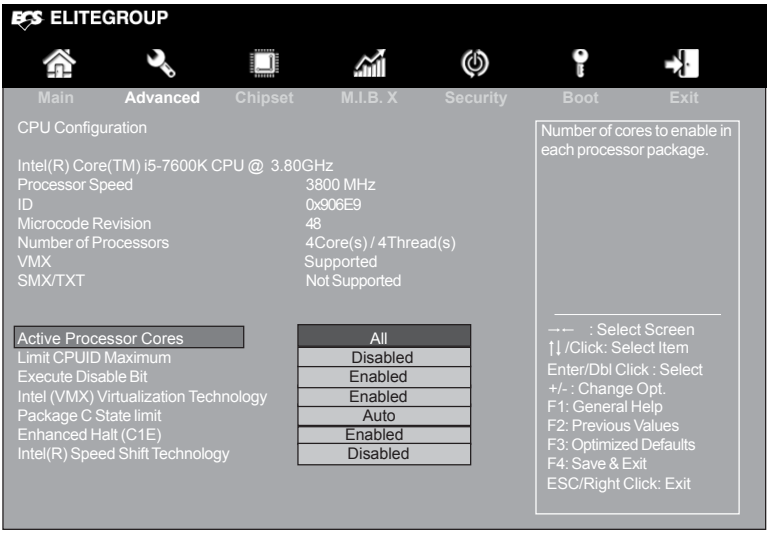
ACPI Sleep State [S3(Suspend to RAM)]

This item allows user to enter the ACPI S3 (Suspend to RAM) Sleep State (default).

Press <Esc> to return to the Advanced Menu page.

≫ CPU Configuration

The item in the menu shows the CPU.



Intel(R) Core(TM) i5-7600K CPU @ 3.80GHz

This is display-only field and displays the information of the CPU installed in your computer.

Processor Speed (3800MHz)

This item shows the current processor speed.

ID (0x906E9)

This item shows the processor stepping version.

Microcode Revision (48)

This item shows the Microcode version.

Number of Processors (4Core(s) / 4Thread(s))

This item shows the core number of the processor.

VMX (Supported)

This item shows the CPU support Intel VMX(Virtual-Machine Extensions) Technology.

SMX/TXT (Not Supported)

This item shows the computer support Intel SMX/TXT Technology or not.

Active Processor Cores (All)

Use this item to control the number of active processor cores.

Limit CPUID Maximum (Disabled)

Use this item to enable or disable the maximum CPUID value limit, you can enables this item to prevent the system from “rebooting” when trying to install Windows NT 4.0.

Intel (VMX) Virtualization Technology (Enabled)

When disabled, a VMM cannot utilize the additional hardware capabilities provided by Vandorpool Technology.

Package C State limit (Auto)

Use this item to set the package C state limit.

Enhanced Halt (C1E) (Enabled)

Use this item to enable the CPU energy-saving function when the system is not running.

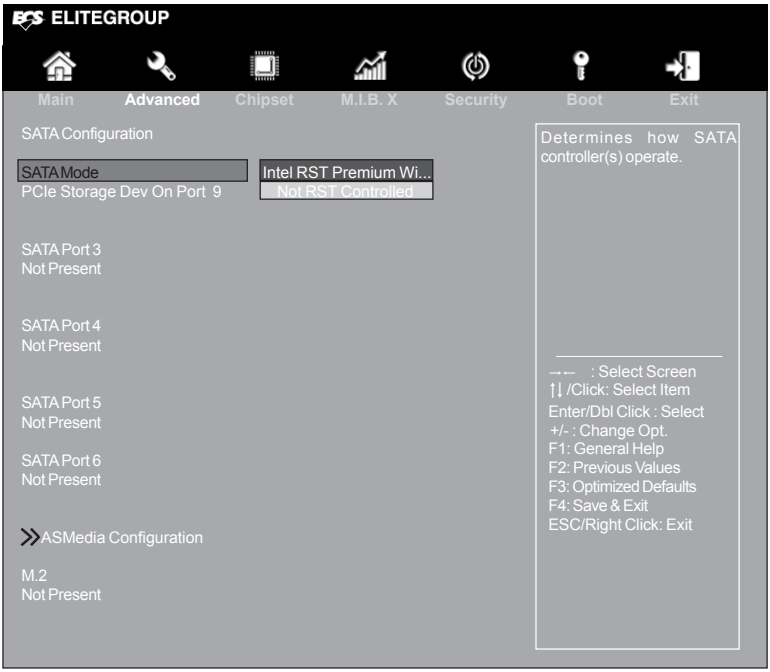
Intel(R) Speed Shift Technology (Disabled)

Use this item to enable or disable the Intel(R) Speed Shift Technology.

Press <Esc> to return to the Advanced Menu page.

≫ SATA Configuration

Use this item to show the mode of serial SATA configuration options.



SATA Mode (Intel RST Premium Wi...)

Use this item to select SATA mode.

PCIe Storage Dev On Port 9 (Not RST Controlled)

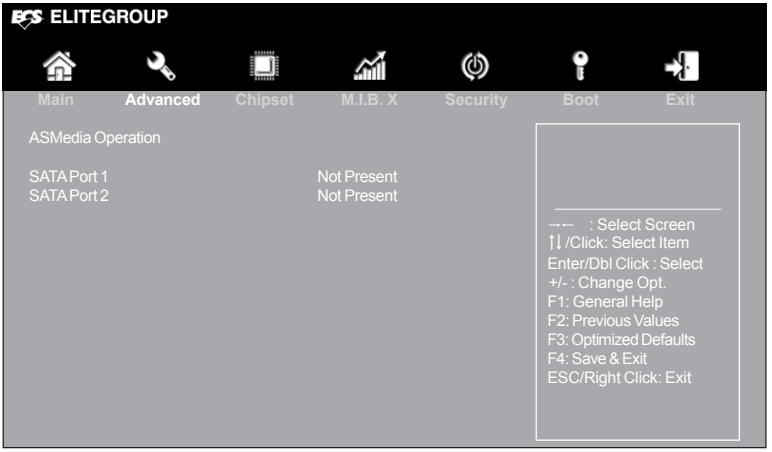
Use this item to select PCIe Storage Dev On Port 9.

SATA Port 3~6/M.2 (Not Present)

This motherboard supports six SATA channels (which supported by Intel Z270 Express Chipset) and one M.2 slot, each channel allows one SATA device to be installed. Use these items to configure each device on the SATA channel.

≫ ASMedia Configuration

Use this item to show the information of ASMedia configuration.



SATA Port 1~2 (Not Present)

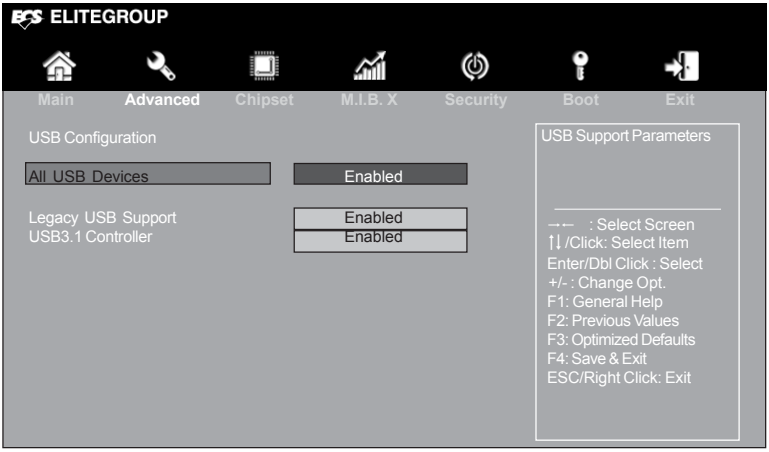
This motherboard supports six SATA channels (which supported by ASMedia ASM1061 Chip), each channel allows one SATA device to be installed. Use these items to configure each device on the SATA channel.

Press <Esc> to return to the SATA Configuration page.

Press <Esc> to return to the Advanced Menu page.

≫ USB Configuration

Use this item to show the information of USB configuration.



All USB Devices (Enabled)

Use this item to enable or disable all on board USB devices.

Legacy USB Support (Enabled)

Use this item to enable or disable support for legacy USB devices.

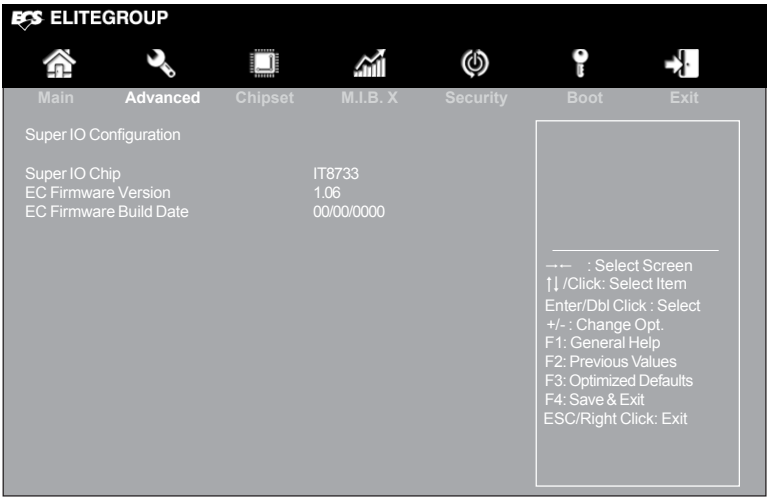
USB3.1 Controller (Enabled)

Use this item to enable or disable USB3.1 controller.

Press <Esc> to return to the Advanced Menu page.

≫ Super IO Configuration

Use this item to show the information of Super IO configuration.



Super IO Chip (IT8733)

This item shows the information of the super IO chip.

EC Firmware Version (1.06)

This item shows the information of the EC Firmware version.

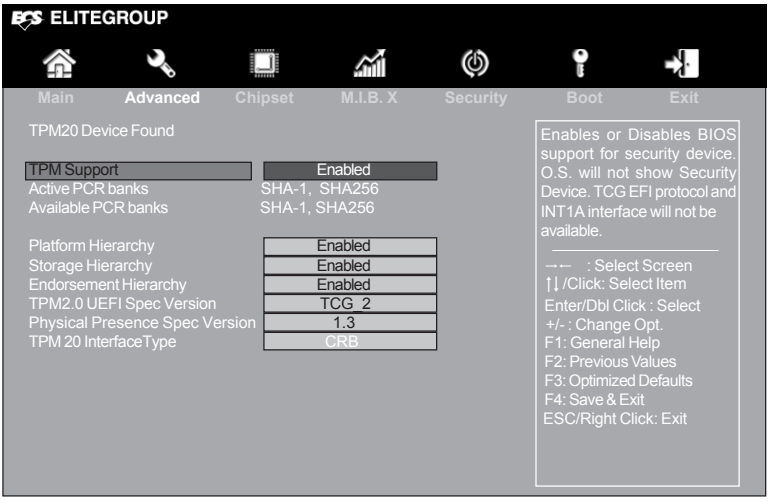
EC Firmware Build Date (00/00/0000)

This item shows the build date of the EC Firmware.

Press <Esc> to return to the Advanced Menu page.

» Trusted Computing

Use this item to show the information of trusted computing configuration.



TPM Support (Enabled)

Use this item to enable or disable the TPM support. O.S. will not show TPM. Reset of platform is required.

Active PCR banks (SHA-1, SHA-256)

Use this item to show the Active PCR banks.

Available PCR banks (SHA-1, SHA-256)

Use this item to show the Available PCR banks.

Platform Hierarchy (Enabled)

Use this item to enable or disable the Platform Hierarchy.

Storage Hierarchy (Enabled)

Use this item to enable or disable the Storage Hierarchy.

Endorsement Hierarchy (Enabled)

Use this item to enable or disable the Endorsement Hierarchy.

TPM2.0 UEFI Spec Version (TCG_2)

This item is used to set the TPM2.0 UEFI Spec Version.

Physical Presence Spec Version (1.3)

This item is used to set the Physical Presence Spec Vesion.

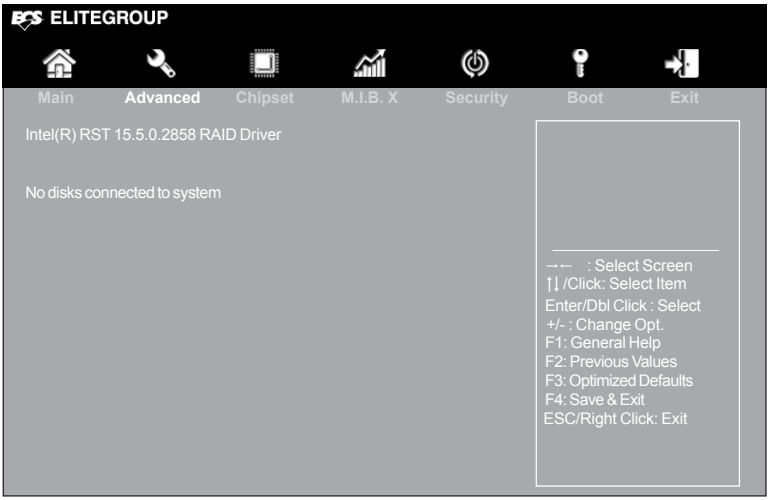
TPM 20 InterfaceType (CRB)

Use this item to show the TPM 20 InterfaceType.

Press <Esc> to return to the Advanced Menu page.

≫ Intel(R) Rapid Storage Technology

Use this item to show the information of Intel(R) Rapid Storage Technology.



Intel(R) RST 15.5.2858 RAID Driver

This item shows the information of Intel(R) RST RAID Driver.

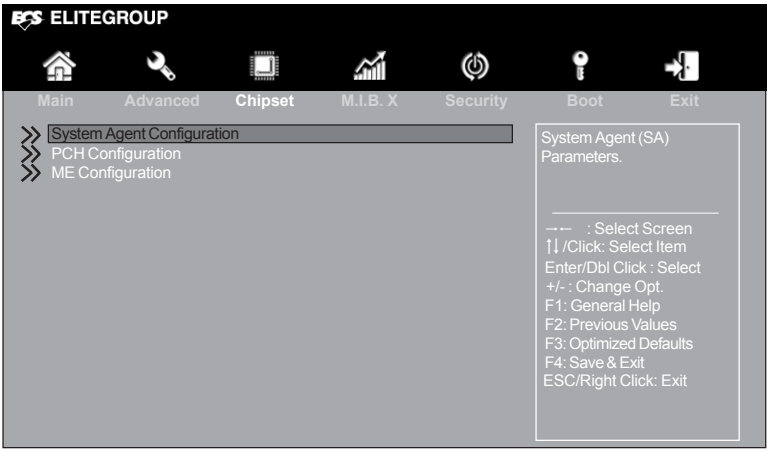
No disks connected to system

This item shows the information of disks connected to system.

Press <Esc> to return to the Advanced Menu page.

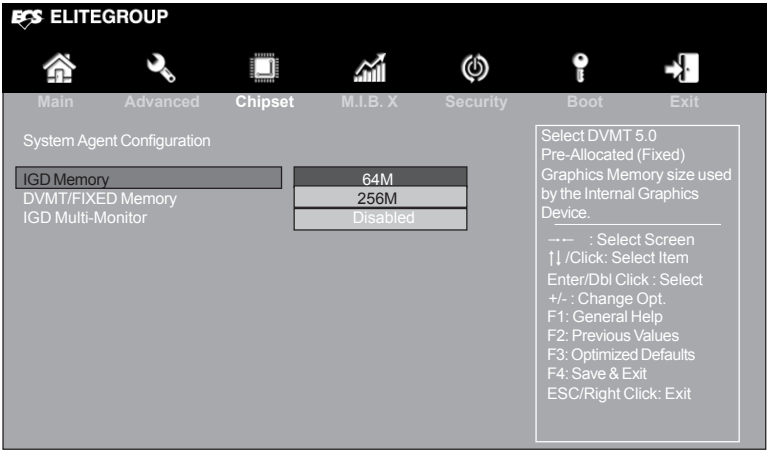
Chipset Menu

The chipset menu items allow you to change the settings for the North Bridge chipset, South Bridge chipset and other system.



» System Agent Configuration

Scroll to this item and press <Enter> to view the following screen:



IGD Memory (64M)

This item shows the information of the IGD (Internal Graphics Device) memory.

DVMT/FIXED Memory (256M)

When set to Fixed Mode, the graphics driver will reserve a fixed position of the system memory as graphics memory. When set to DVMT Mode, the graphics chip will dynamically allocate system memory as graphics memory, according to system and graphics requirements.

IGD Multi-Monitor (Disabled)

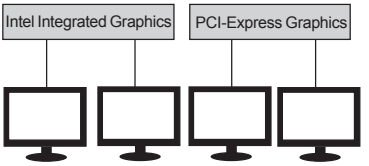
This item allows you to enable or disable the IGD Multi-Monitor.

Press <Esc> to return to the Chipset Menu page.

Multi-Monitor technology

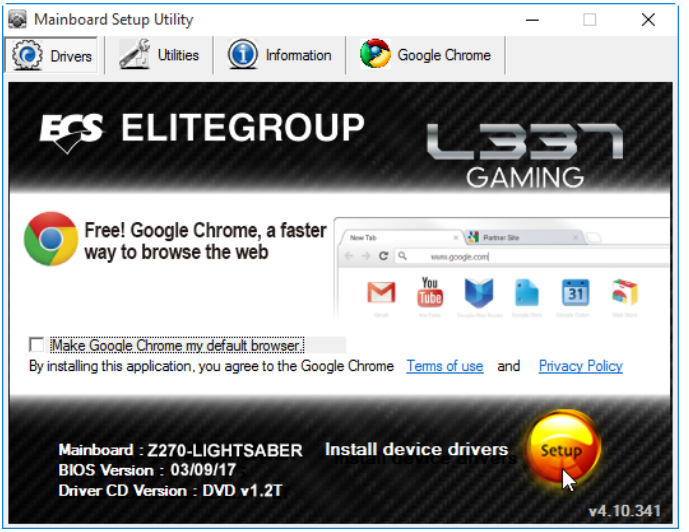
Multi-Monitor technology can help you to increase the area available for programs running on a single computer system through using multiple display devices.

It is not only to increase larger screen viewing but also to improving personal productivity.

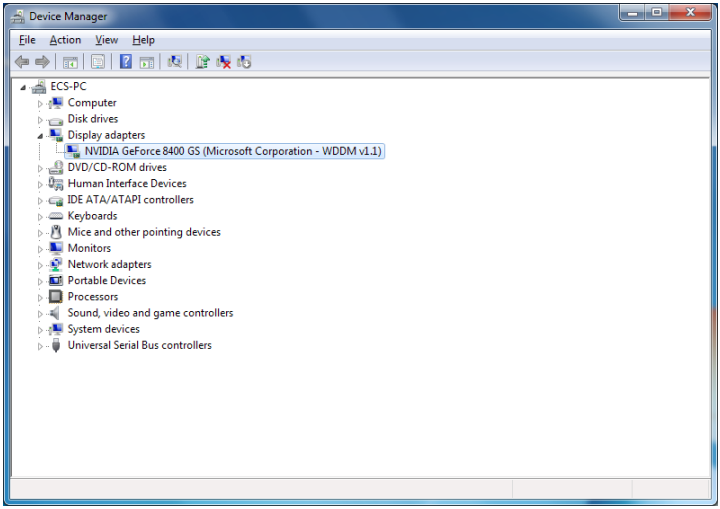


Please note that Multi-Monitor technology supports up to four monitors: one or two Intel integrated Graphics and one or two PCI-Express graphics devices under Windows 7/8/8.1.

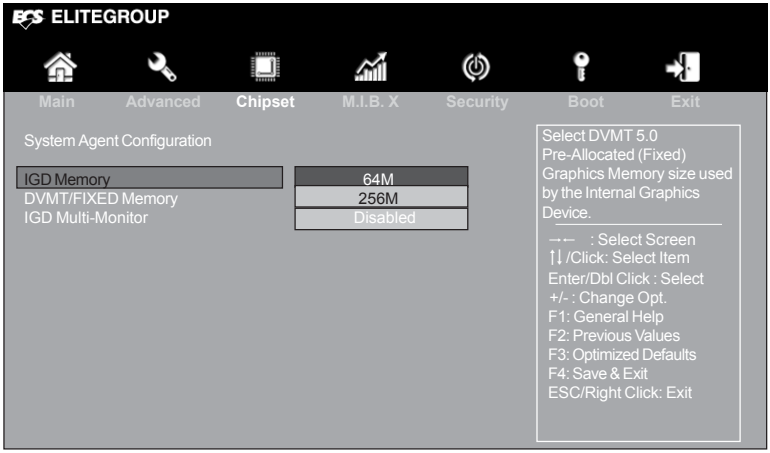
Step 1. Insert ECS drives DVD to run Auto setup or browse the DVD to install Intel chipset drivers, VGA and sound drivers.(If you want know the detail information, please refer to chapter 4.)



Step 2. Install all the drivers of PCI-Express graphic cards. Click the Browse CD item, then appears the following screen. Select the driver you want to install(e.g NVIDIA GeForce 8400 GS(Microsoft Corporation-WDDM v1.1)) and double click it.

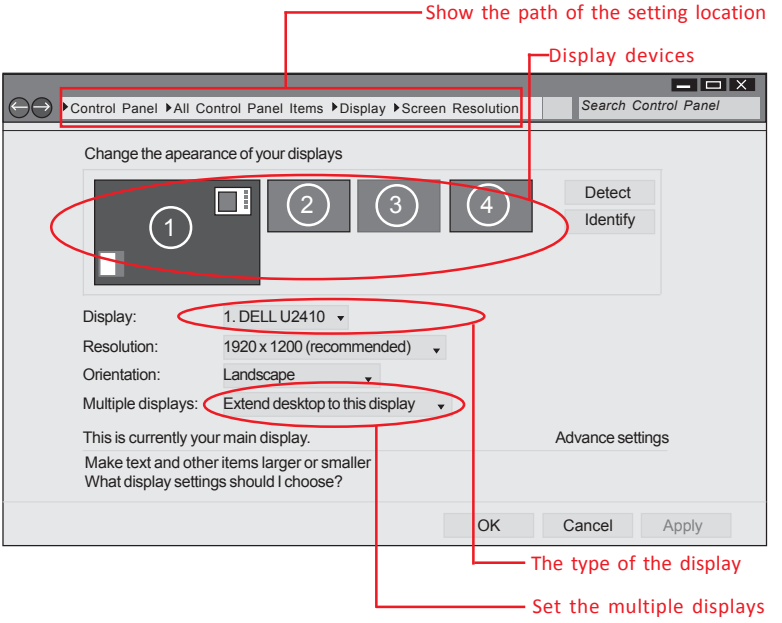


Step 3. Enable IGD Multi-Monitor from BIOS. In the following BIOS screen, please set IGD Multi-Monitor to [Enabled].

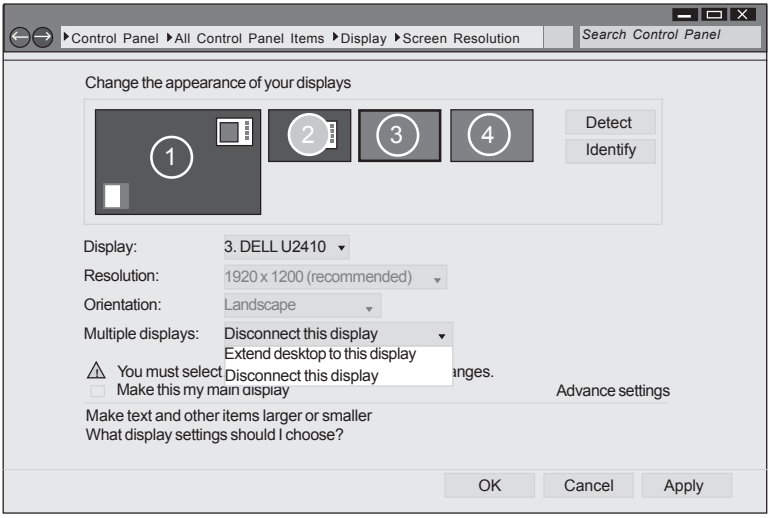


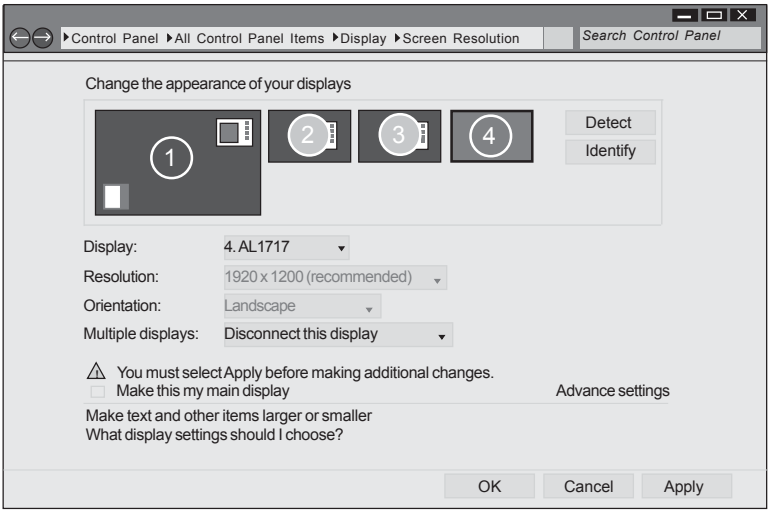
Step 4. Change the appearance of your displays under Windows 7/8/8.1.

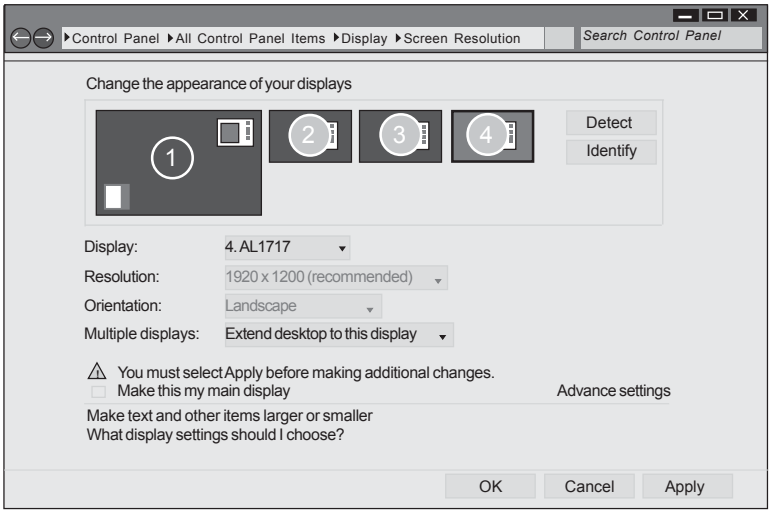
1. Enter the Control Panel menu, select the Display in the All Control Panel Items and click the Screen Resolution, then appears the following screen.



2.Select display devices, set the multiple displays option and to extend desktop for display “Multi-Monitor technology”.

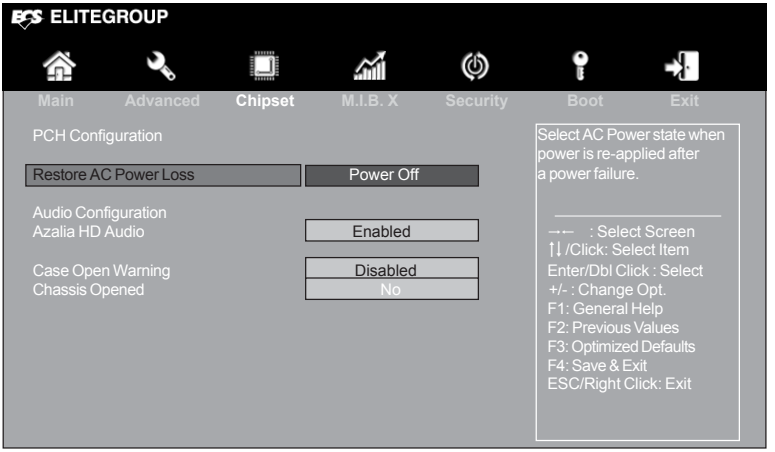



Control Panel ▸ All Control Panel Items ▸ Display ▸ Screen Resolution
Search Control Panel
Change the appearance of your displays
1
2
3
4
Detect
Identify
Display: 4. AL1717
Resolution: 1920 x 1200 (recommended)
Orientation: Landscape
Multiple displays: Disconnect this display
You must select Apply before making additional changes.
Make this my main display
Advance settings
Make text and other items larger or smaller
What display settings should I choose?
OK
Cancel
Apply


Control Panel ▸ All Control Panel Items ▸ Display ▸ Screen Resolution
Search Control Panel
Change the appearance of your displays
1
2
3
4
Detect
Identify
Display: 4. AL1717
Resolution: 1920 x 1200 (recommended)
Orientation: Landscape
Multiple displays: Extend desktop to this display
You must select Apply before making additional changes.
Make this my main display
Advance settings
Make text and other items larger or smaller
What display settings should I choose?
OK
Cancel
Apply

≫PCH Configuration

Scroll to this item and press <Enter> to view the following screen:



Restore AC Power Loss (Power Off)

This item enables your computer to automatically restart or return to its operating status.

Azalia HD Audio (Enabled)

This item enables or disables Azalia HD audio.

Case Open Warning (Disabled)

This item enables or disables the warning if the case is opened up, and the item below indicates the current status of the case.

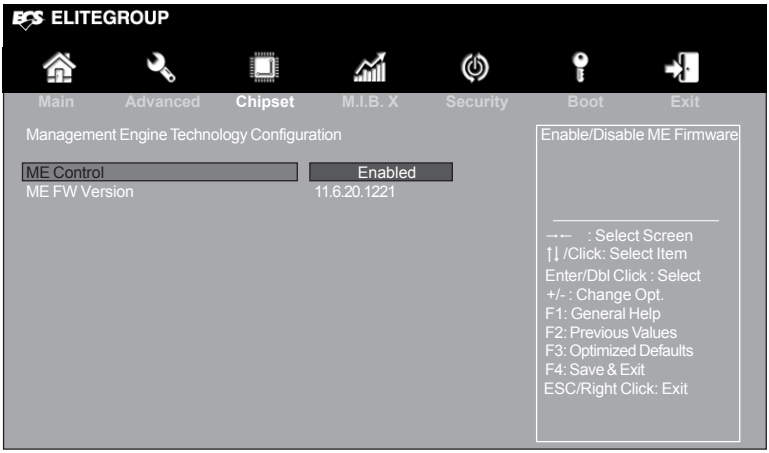
Chassis Opened (No)

This item indicates whether the case has been opened.

Press <Esc> to return to the Chipset Menu page.

≫ ME Configuration

Scroll to this item and press <Enter> to view the following screen:



ME Control (Enabled)

Use this item to enable or disable the ME Firmware.

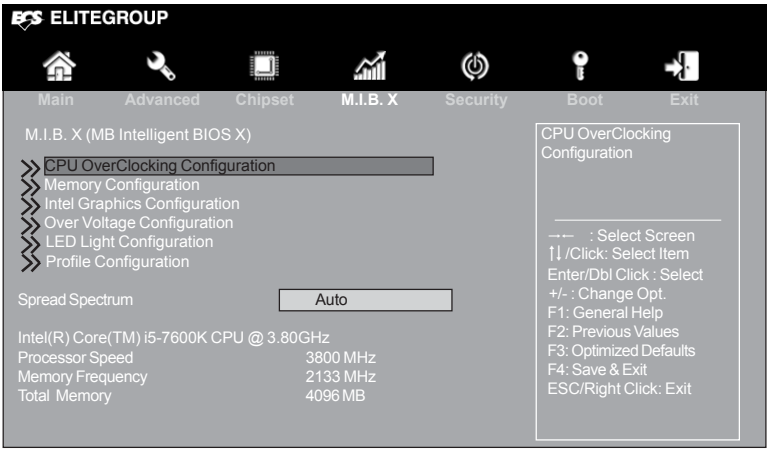
ME FW Version (11.6.20.1221)

This item shows the ME FW version.

Press <Esc> to return to the Chipset Menu page.

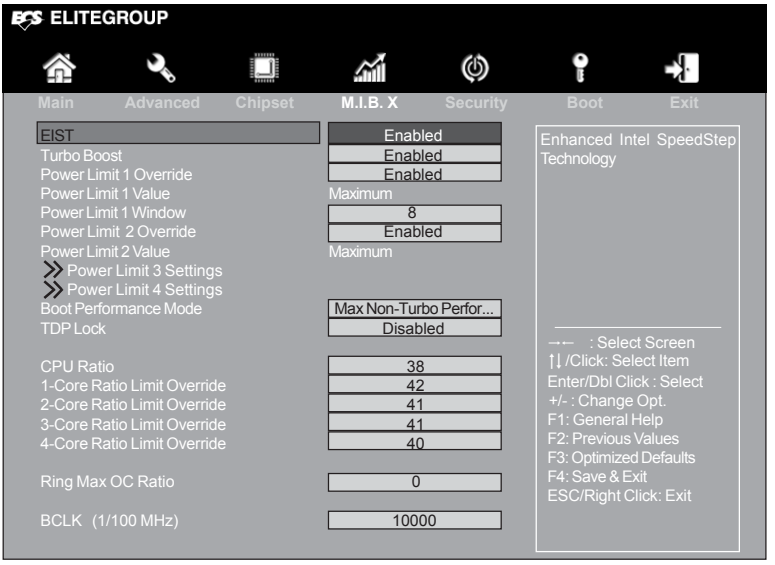
M.I.B. X (MB Intelligent BIOS X) Menu

This page enables you to set the clock speed and system bus for your system. The clock speed and system bus are determined by the kind of processor you have installed in your system.



» CPU OverClocking Configuration

Scroll to this item to view the following screen:



EIST (Enabled)

This item allows users to enable or disable the EIST (Enhanced Intel SpeedStep Technology).

Turbo Boost (Enabled)

This item allows you to enable or disable turbo boost.

Power Limit 1/2 Override (Enabled)

Use these items to enable or disable the Power Limit 1/2 Override. If these options are disabled, BIOS will program the default values for Power Limit 1/2.

Power Limit 1/2 Value (Maximum)

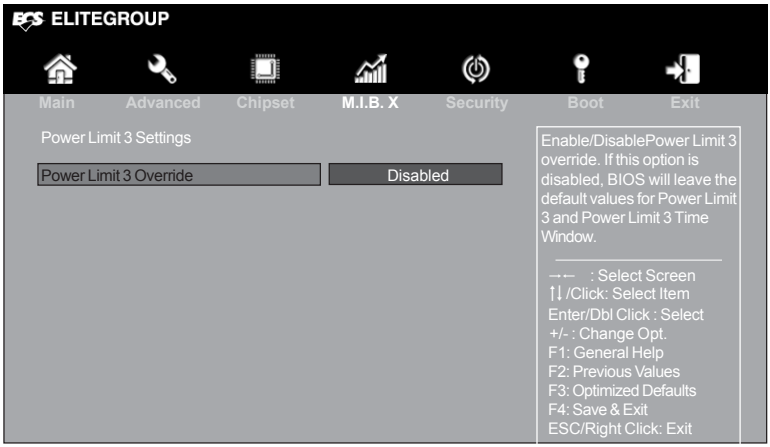
Use these items to control the limit of the TDP. These are for Turbo mode.

Power Limit 1 Window (8)

Power limit 1 Time Window value in seconds. The value may vary from 0 to 128. If the value is 0, default values will be programmed (28 sec for Mobile and 1 sec for Desktop). Indicates the time window over which TDP value should be maintained.

» Power Limit 3 Settings

Scroll to this item and press <Enter> to view the following screen:



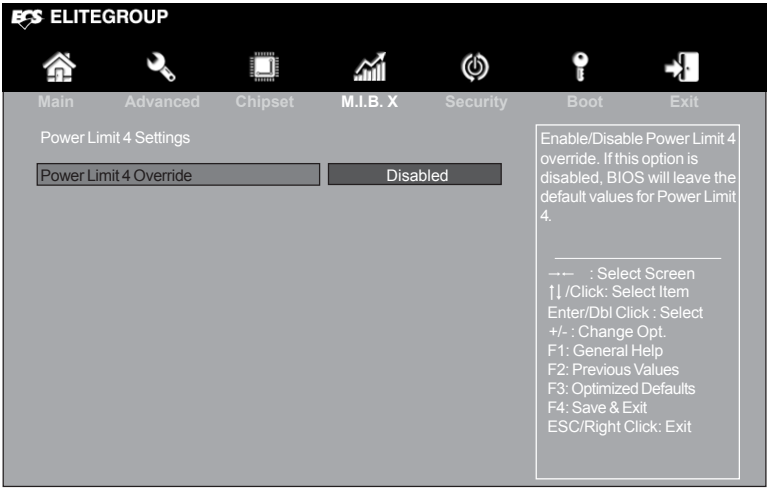
Power Limit 3 Settings

Use this item to enable or disable the power limit 3 override. If this option is disabled, BIOS will leave the default values for power limit 3 and power limit 3 time window.

Press <Esc> to return to the CPU OverClocking Configuration page.

» **Power Limit 4 Settings**

Scroll to this item and press <Enter> to view the following screen:



Power Limit 4 Settings

Use this item to enable or disable the power limit 4 override. If this option is disabled, BIOS will leave the default values for power limit 4.

Press <Esc> to return to the CPU OverClocking Configuration page.

Boot Peformance Mode (Normal)

Use this item to select the performance state that the BIOS will set before OS handoff.

TDP Lock (Disabled)

This item allows you to enable or disable the Package TDP lock.

CPU Ratio (38)

This item allows you to control CPU ratio.

1-Core /2-Core /3-Core /4-Core Ratio Limit (42/41/41/40)

Use these items to set the Core Ratio Limit Value.

Ring Max OC Ratio (0)

Use this item to set the Ring Max OC Ratio value.

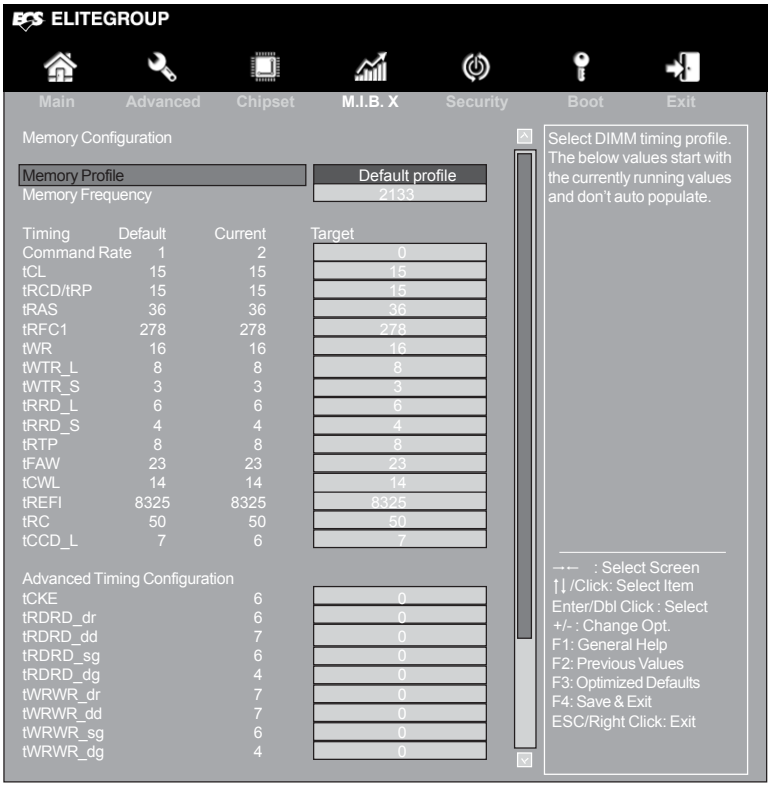
BCLK (1/100 MHz) (10000)

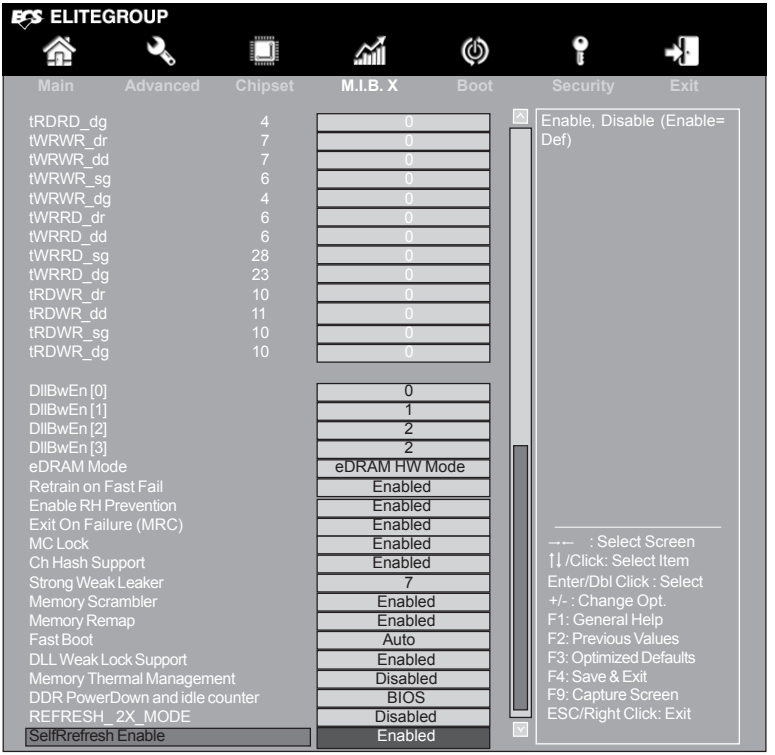
Use this item to set the BCLK (1/100 MHz) value.

Press <Esc> to return to the M.I.B. X Menu page.

Memory Configuration

Scroll to this item to view the following screen:





Memory Profile (Default profile)

This item enables you to set the memory profiles. The selection of memory profiles impacts memory sizing behavior.

Memory Frequency (2133)

This item shows the memory frequency.

DllBwEn [0/1/2/3] (0/1/2/2)

Use these items to set the DllBwEn value.

eDRAM Mode (Auto)

Use this item to set the eDRAM Mode.

Retrain on Fast Fail (Enabled)

Use this item to enable or disable the retrain on fast fail.

Enable RH Prevention (Enabled)

Use this item to enable or disable the RH prevention.

Exit On Failure (MRC) (Enabled)

Use this item to enable or disable the exit on failure (MRC).

Mc Lock (Enabled)

This item allows you to enable or disable capacity to lock MC registers or not.

Ch Hash Support (Enabled)

Use this item to enable or disable the Ch Hash support.

Strong Weak Leaker (7)

Use this item to set the strong weak leaker value.

Memory Scrambler (Enabled)

This item allows you to enable or disable the memory scrambler.

Memory Remap (Enabled)

This item allows you to enable or disable the memory remap above 4G.

Fast Boot (Auto)

This item allows you to enable or disable the fast boot.

DLL Weak Lock Support (Enabled)

This item allows you to enable or disable the DLL weak lock support.

Memory Thermal Management (Disabled)

This item allows you to enable or disable the memory thermal management.

DDR PowerDown and idle counter (BIOS)

This item allows you to BIOS or PCODE the DDR Power Down and idle counter. BIOS: BIOS is in countrol of DDR CKE mode and idle timer value. PCODE: pcode will manage the modes.

REFRESH_2X_MODE (Disabled)

This item allows you to enable or disable 2xRef when warm and Hot 2-iMC enables 2xRef when Hot.

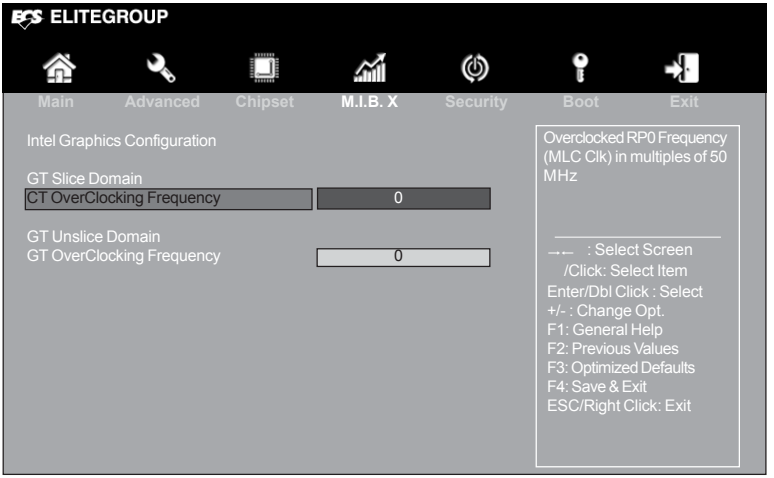
SelfRefresh Enable (Enabled)

Use this item to enable or disable the SelfRefresh.

Press <Esc> to return to the M.I.B. X Menu page.

≫ Intel Graphics Configuration

Scroll to this item to view the following screen:



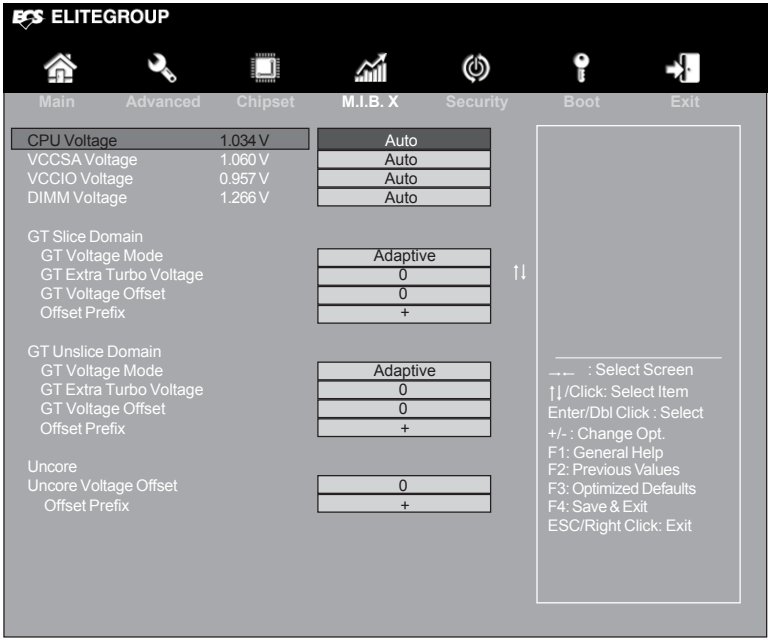
GT OverClocking Frequency (0)

This item allows you to adjust the GT OverClocking frequency.

Press <Esc> to return to the M.I.B. X Menu page.

» Over Voltage Configuration

Scroll to this item to view the following screen:



CPU Voltage 1.034 V (Auto)

This item allows you to adjust the CPU voltage.

VCCSA Voltage 1.060 V (Auto)

This item allows you to adjust the VCCSA voltage.

VCCIO Voltage 0.957 V (Auto)

This item allows you to adjust the VCCIO voltage.

DIMM Voltage 1.266 V (Auto)

This item allows you to adjust the DIMM voltage.

GT Voltage Mode (Adaptive)

This item allows you to set the GT voltage mode.

GT Extra Turbo Voltage (0)

This item allows you to adjust the GT extra turbo voltage.

GT Uncore/Voltage Offset (0)

This item allows you to adjust the Uncore/GT voltage offset from -1000 to 998mV.

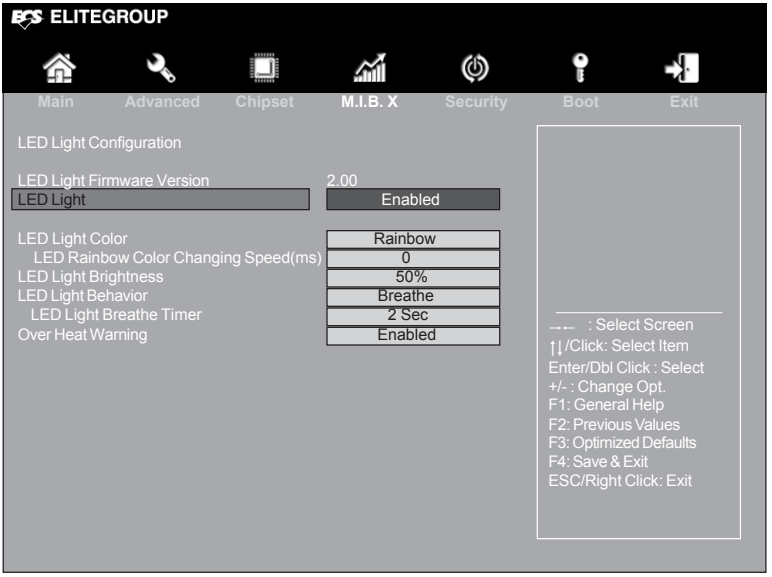
Offset Prefix (+)

This item allows you to select the offset value as positive (+) or negative (-).

Press <Esc> to return to the M.I.B. X Menu page.

LED Light Configuration

Scroll to this item to view the following screen:



LED Light Firmware Version (2.00)

This item shows the LED Light Firmware Version.

LED Light (Enabled)

This item allows you to enable or disable the LED Light.

LED Light Color (Rainbow)

This item allows you to set the LED light color.

LED Rainbow Color Changing Speed(ms) (0)

This item allows you to adjust LED Rainbow Color Changing Speed.

LED Light Brightness (50%)

This item allows you to set the LED Light Brightness.

LED Light Behavior (Breathe)

This item allows you to adjust LED Light Behavior.

LED Light Breathe Timeer (2 Sec)

This item allows you to adjust the LED Light Breathe Timer.

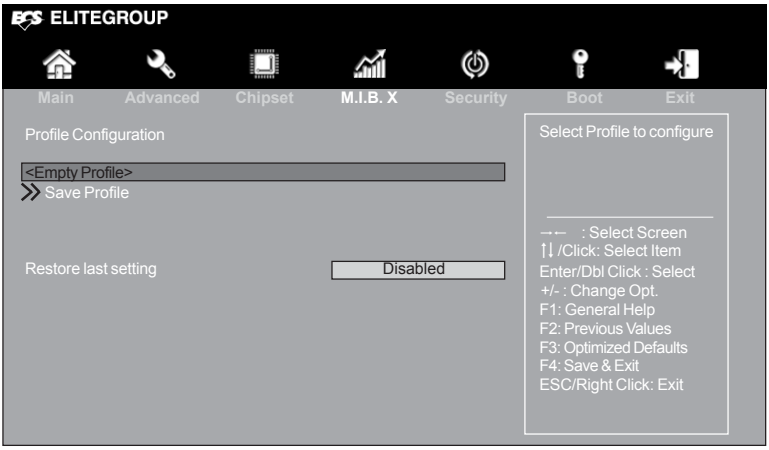
Over Heat Warning (Enabled)

This item allows you to enable or disable Over Heat Warning. If enable this function, the LED light would turn Red when CPU temperature is Over Heat.

Press <Esc> to return to the M.I.B. X Menu page.

Profile Configuration

Scroll to this item to view the following screen:



Save Profile

Use this item to save BIOS setup data to profile.

Restore last setting (Disabled)

This item allows you to enable or disable to restore the last setting.

Press <Esc> to return to the M.I.B. X Menu page.

Spread Spectrum (Auto)
If you enable spread spectrum, it can significantly reduce the EMI (Electro-Magnetic Interference) generated by the system.

Intel(R) Core(TM) i5-7600K CPU @ 3.80GHz
This is display-only field and displays the information of the CPU installed in your computer.

Processor Speed (3800 MHz)
This item shows the CPU speed.

Memory Frequency (2133 MHz)
This item shows the memory frequency.

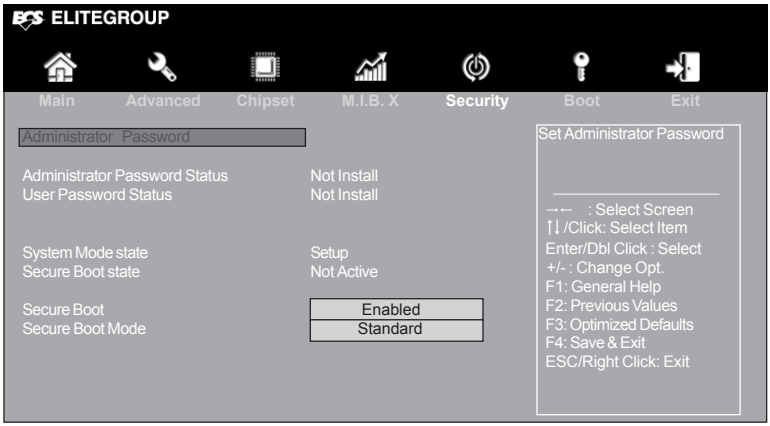
Total Memory (4096 MB)
This item shows the total memory.

Warning: Over-clocking components can adversely affect the reliability of the system and introduce errors into your system. Over-clocking can permanently damage the motherboard by generating excess heat in components that are run beyond the rated limits.

Fail-Safe Procedures for Over-clocking
When end-users encounter failure after attempting over-clocking, please take the following steps to recover from it.
1. Shut down the computer.
2. Press and hold the “Page Up Key (PgUp)” of the keyboard, and then boot the PC up.
3. Two seconds after the PC boots up, release the “Page Up Key (PgUp)”.
4. The BIOS returns to the default setting by itself.

Security Menu

This page enables you to set setup administrator password and user password.



Administrator Password Status (Not Install)

This item shows administrator password installed or not.

User Password Status (Not Install)

This item shows user password installed or not.

System Mode state (Setup)

This item shows system mode setup or not.

Secure Boot state (Not Active)

This item allows you to enable or disable the secure boot state.

Secure Boot (Enabled)

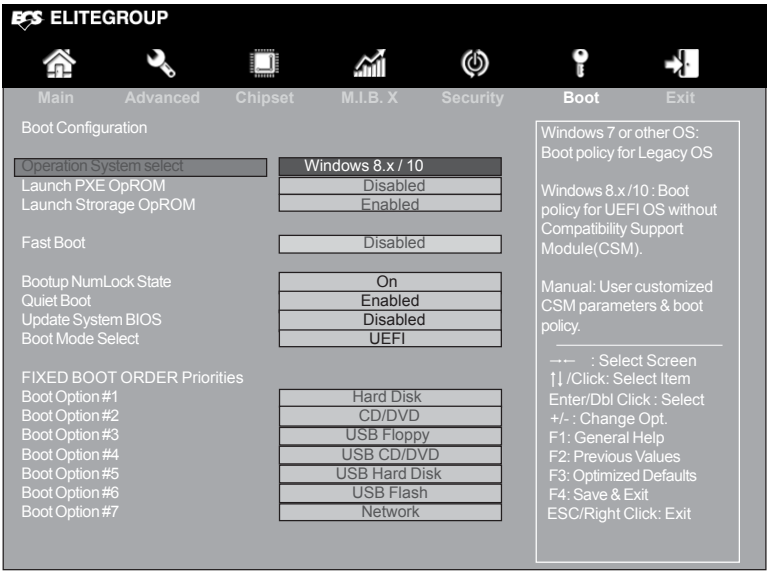
This item is used to control the secure boot flow, it is possible only if system runs in User Mode.

Secure Boot Mode (Standard)

This item is used to select secure boot mode, when you select standard mode, secure boot policy is fixed; when you select custom mode, the image execution policy and secure boot key databases are changeable.

Boot Menu

This page enables you to set the keyboard NumLock state.



Operation System Select (Windows 8.x / 10)

This item is used to select the operation system.

Launch PXE OpROM (Disabled)

The item enables or disables launch PXE Option ROM.

Launch Storage OpROM (Enabled)

Use this item to enable or disable the Storage OpROM.

Fast Boot (Disabled)

This item enables or disables boot with initialization of a minimal set of device required to launch active boot option. Has no effect for BBS boot options.

Bootup NumLock State (On)

This item enables you to select NumLock state.

Quiet Boot (Enabled)

This item enables or disables quiet boot.

Update System BIOS (Disabled)

This item enables or disables to update system BIOS.

Boot Mode Select (UEFI)

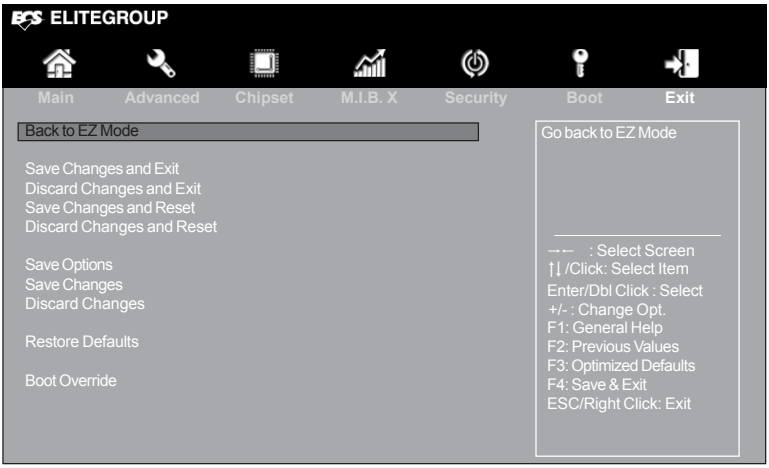
Use this item to select boot mode.

Boot Option #1 /2 /3 /4 /5 /6 /7

These items show the boot priorities.

Exit Menu

This page enables you to exit system setup after saving or without saving the changes.



Back to EZ Mode

This item enables you to back to EZ mode.

Save Changes and Exit

This item enables you to exit the system setup after saving the changes.

Discard Changes and Exit

This item enables you to exit system setup without saving any changes.

Save Changes and Reset

This item enables you to reset system setup after saving the changes.

Discard Changes and Reset

This item enables you to reset system setup without saving any changes.

Save Options

This item enables you to save the options that you have made.

Save Changes

This item enables you to save the changes that you have made.

Discard Changes

This item enables you to discard any changes that you have made.

Restore Defaults

This item enables you to restore defaults to all the setup options.

Boot Override

Use this item to select the boot device.

Updating the BIOS

You can download and install updated BIOS for this motherboard from the manufacturer's Website. New BIOS provides support for new peripherals, improvements in performance, or fixes for known bugs. Install new BIOS as follows:

1. If your motherboard has a BIOS protection jumper, change the setting to allow BIOS flashing.
2. If your motherboard has an item called Firmware Write Protect in Advanced BIOS features, disable it. (Firmware Write Protect prevents BIOS from being overwritten.)
3. Prepare a bootable device or create a bootable system disk. (Refer to Windows online help for information on creating a bootable system disk.)
4. Download the Flash Utility and new BIOS file from the manufacturer's Web site. Copy these files to the bootable device.
5. Turn off your computer and insert the bootable device in your computer. (You might need to run the Setup Utility and change the boot priority items on the Advanced BIOS Features Setup page, to force your computer to boot from the bootable device first.)
6. At the C:\ or A:\ prompt, type the Flash Utility program name and the file name of the new BIOS and then press <Enter>. Example: AFUDOS.EXE 040706.ROM
7. When the installation is complete, remove the bootable device from the computer and restart your computer. If your motherboard has a Flash BIOS jumper, reset the jumper to protect the newly installed BIOS from being overwritten. The computer will restart automatically.

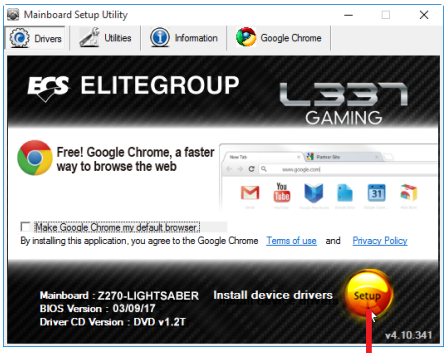
This concludes Chapter 3. Refer to the next chapter for information on the software supplied with the motherboard.

Chapter 4

Using the Motherboard Software

Auto-installing under Windows 7/8.1/10

The auto-install DVD-ROM makes it easy for you to install the drivers and software. The support software DVD-ROM disc loads automatically under Windows 7/8.1/10. When you insert the DVD-ROM disc in the DVD-ROM drive, the auto-run feature will automatically bring up the installation screen. The screen has one button on it: **Setup**.

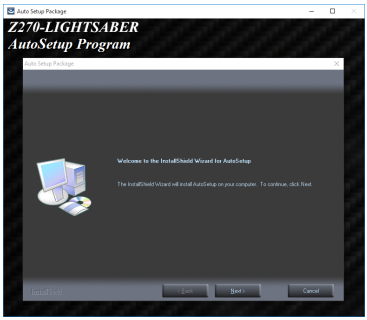


Click the "**Setup**" button to select and run the software installation program.

Running Setup

Follow these instructions to install device drivers and software for the motherboard:

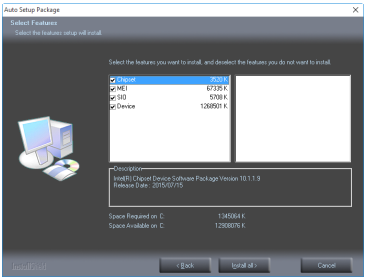
1. Click **Setup**. The installation program begins:



The following screens are examples only. The screens and driver lists will be different according to the motherboard you are installing.

The motherboard identification is located in the upper left-hand corner.

2. Click **Next.** The following screen appears:



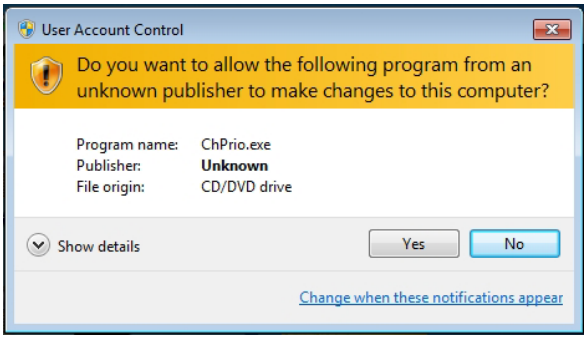
3. Check the box next to the items you want to install. The default options are recommended.

4. Click **Install all** to run the Installation Wizard.

Drivers and software are automatically installed in sequence. Follow the onscreen instructions, confirm commands and allow the computer to restart a few times to complete the installation.

Windows 8 will show the following screen after system restart, you must select "Desktop" in the bottom left to install the next driver.

Windows 7/8.1/10 will appear below UAC (User Account Control) message after the system restart. You must select "Yes" to install the next driver. Continue this process to complete the drivers installation.



Manual Installation

If the auto-install DVD-ROM does not work on your system, you can still install drivers through the file manager for your OS (for example, Windows Explorer). Look for the chipset and motherboard model, and then browse to the directory and path to begin installing the drivers. Most drivers have a setup program (SETUP.EXE) that automatically detects your operating system before installation. Other drivers have the setup program located in the operating system subfolder.

If the driver you want to install does not have a setup program, browse to the operating system subfolder and locate the readme text file (README.TXT or README.DOC) for information on installing the driver or software for your operating system.

ECS Utility Software (Intelligent EZ Utility)

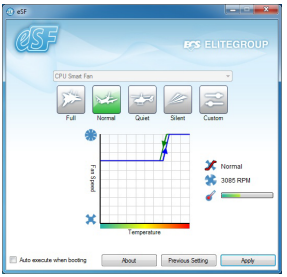
ECS Intelligent EZ Utility provides friendly interfaces under Windows O.S, which makes your computing more easily and conveniently.

These software(s) are subject to change at anytime without prior notice. Please refer to the support disk for available software.

eSF

eSF(Smart Fan) utility provides easy and safe way to adjust fan speed in accordance with your PC's system loading and temperature.

It has five modes to adjust fan speed in a safe range without entering the BIOS to optimize your system cooling environment.



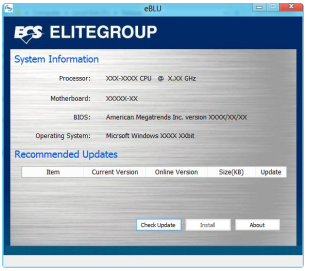
Microsoft .NET Framework 3.5 is required.

eDLU

ECS eDLU utility makes updating drivers fast and easy. eDLU saves time and hassle by listing all the latest drivers online. Just select the one you prefer and start to download and install the drivers.

eBLU

ECS eBLU utility makes BIOS update faster and easier. eBLU will list the latest BIOS with a default check-mark. Click"install" button to install.



Microsoft .NET Framework 3.5 is required.

Chapter 5

AMD CrossFireX™ Technology Support

This motherboard supports the AMD CrossFireX™ Technology that allows you to install multi-graphics processing units (GPU) graphics cards. Follow the installation procedures in this section.

Requirements

1 Two identical CrossFireX™ ready graphic cards are needed for the setup of 2-way CrossFireX™ configuration.
2 You would need one CrossfireX™ bridge cable.
3 Make sure that your graphics card driver supports the AMD CrossFireX™ technology. Download the latest driver from the AMD website (www.amd.com).
4 Make sure that your power supply unit (PSU) can provide at least the minimum power required by your system.

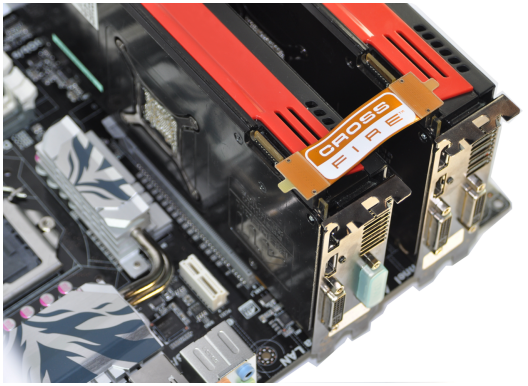
Installing CrossFireX™ graphics cards

1. Insert the CrossFireX™ graphics cards into the **PCIEX16_1~3** slots. Make sure that the card is properly seated on the slot.

A. For 2-way configuration, install two graphic cards on PCIEX16_1 and PCIEX16_2, then connect them with the CrossFire™ Bridge.

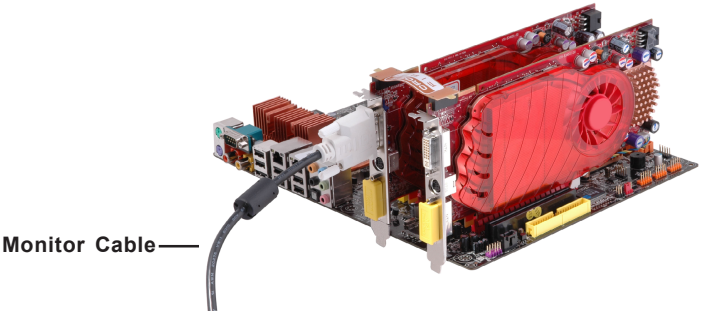
** For reference only*

B. For 3-way configuration, two CrossFire™ Bridges are needed to connect the three graphic cards.



** For reference only*

2. Connect the cable from your monitors to the CrossFireX™ ready graphics card installed on the **PCIEX16** slot.



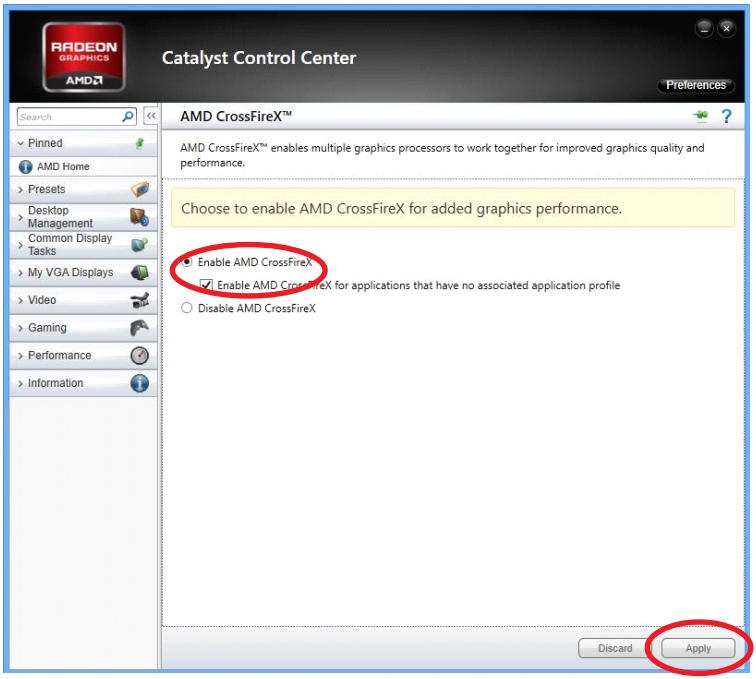
** For reference only*

3. Connect an auxiliary power source from the power supply to the graphics cards.

The Catalyst™ Control Center Dialog Box

To enable CrossFireX™:

- Install AMD graphic card driver.
- Enter the Catalyst Control Center Dialog Box.
- check the "Enable CrossFireX™" item.
- Click Apply button.



Memo

Chapter 6
Trouble Shooting

Start up problems during assembly

After assembling the PC for the first time you may experience some start up problems. Before calling for technical support or returning for warranty, this chapter may help to address some of the common questions using some basic troubleshooting tips. You may also log onto our ECS website for more information: *http:// www.ecs.com.tw/ECSWebSite/Support/Support_FAQ.aspx?MenuID=49& childid=M 49&LanID=0*

a) System does not power up and the fans are not running.

1. Disassemble the PC to remove the VGA adaptor card, DDR memory, LAN, USB and other peripherals including keyboard and mouse. Leave only the motherboard, CPU with CPU cooler and power supply connected. Make sure the power cord is plugged into the wall socket & the switch on the Power Supply Unit (PSU) is turned " on " as well. Turn on again to see if the CPU and power supply fans are running.

2. Make sure to remove any unused screws or other metal objects such as screwdrivers from the inside PC case. This is to prevent damage from short circuit.

3. Check the CPU FAN connector is connected to the motherboard.

4. For Intel platforms check the pins on the CPU socket for damage or bent. A bent pin may cause failure to boot and sometimes permanent damage from short circuit.

5. Check the 12V power connector is connected to the motherboard.

6. Check that the 12V power & ATX connectors are fully inserted into the motherboard connectors. Make sure the latches of the cable and connector are locked into place.

b) Power is on, fans are running but there is no display

1. Make sure the monitor is turned on and the monitor cable is properly connected to the PC.

2. Check the VGA adapter card (if applicable) is inserted properly.

3. Listen for beep sounds. If you are using internal PC speaker make sure it is connected.
   a. continuous 3 short beeps: memory not detected
   b. 1 long beep and 8 short beeps: VGA not detected

c) The PC suddenly shuts down while booting up.

1. The CPU may experience overheating so it will shutdown to protect itself. Apply the thermal grease onto the CPU heatsink & ensure the CPU fan is well-connected with the CPU heatsink. Check if the CPU fan is working properly while the system is running.

2. From the BIOS setting, try to disable the Smartfan function to let the fan run at default speed. Doing a Load Optimised Default will also disable the Smartfan.

Start up problems after prolong use

After a prolong period of use your PC may experience start up problems again. This may be caused by breakdown of devices connected to the motherboard such as HDD, CPU fan, etc. The following tips may help to revive the PC or identify the cause of failure.

1. Clear the CMOS values using the CLR_CMOS jumper. Refer to CLR_CMOS jumper in Chapter 2 for Checking Jumper Settings in this user manual. When completed, follow up with a Load Optimised Default in the BIOS setup.

2. Check the CPU cooler fan for dust. Long term accumulation of dust will reduce its effectiveness to cool the processor. Clean the cooler or replace a new one if necessary.

3. Check that the 12V power & ATX connectors are fully inserted into the motherboard connectors. Make sure the latches of the cable and connector are locked into place.

4. Remove the hard drive, optical drive or DDR memory to determine which of these components may be at fault.

5. Check whether there is any bulked up electrolytic capacitor or abnormal component.

Please logo onto our ECS website: http://www.ecs.com.tw/ECSWebSite/Support/Technical_Support_List.aspx?MenuID=50&LanID=0 for more information.

Maintenance and care tips

Your computer, like any electrical appliance, requires proper care and maintenance. Here are some basic PC care tips to help prolong the life of the motherboard and keep it running as best as it can.

1. Keep your computer in a well ventilated area. Leave some space between the PC and the wall for sufficient airflow.

2. Keep your computer in a cool dry place. Avoid dusty areas, direct sunlight and areas of high moisture content.

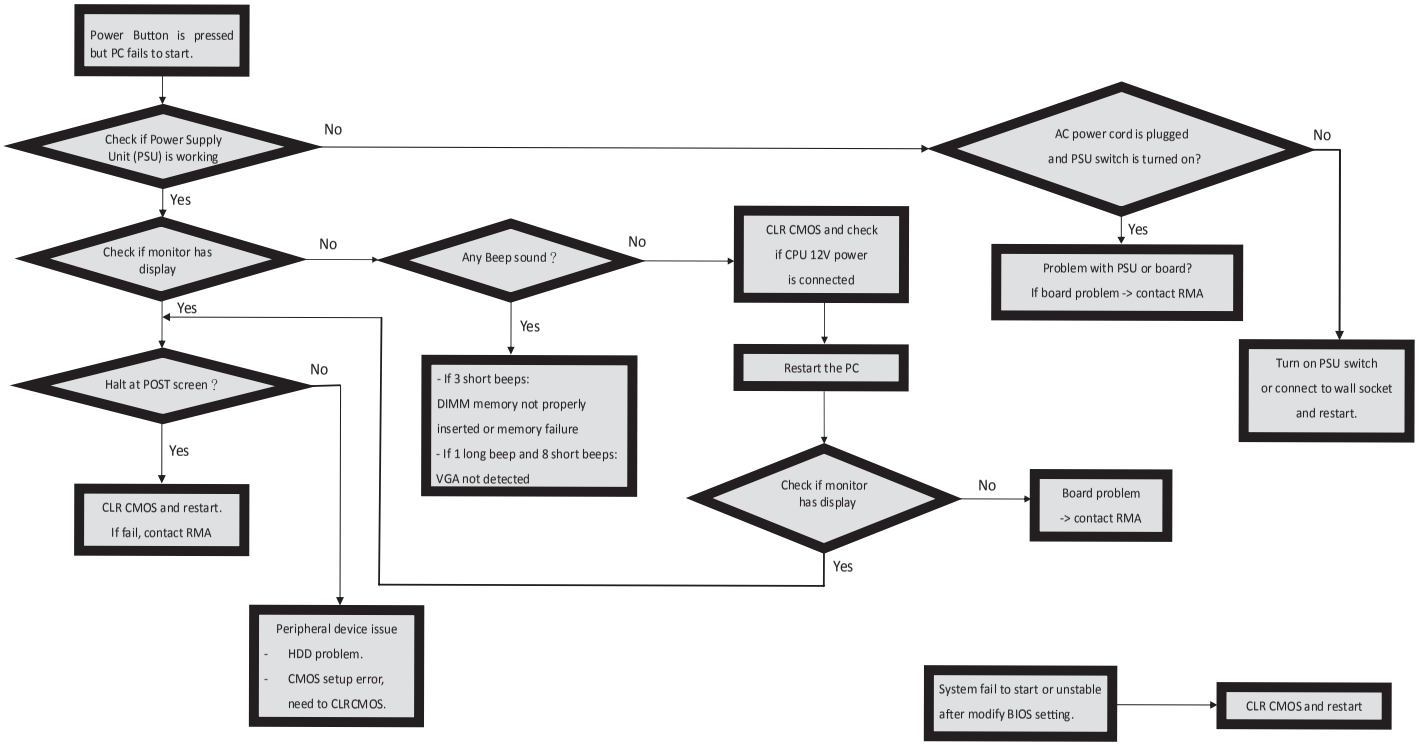
3. Routinely clean the CPU cooler fan to remove dust and hair.

4. In places of hot and humid weather you should turn on your computer once every other week to circulate the air and prevent damage from humidity.

5. Add more memory to your computer if possible. This not only speeds up the system but also reduces the loading of your hard drive to prolong its life span.

6. If possible, ensure the power cord has an earth ground pin directly from the wall outlet. This will reduce voltage fluctuation that may damage sensitive devices.

Basic Troubleshooting Flowchart



Memo

POST Code Checkpoints

The POST code checkpoints are the largest set of checkpoints during the BIOS pre-boot process. The following table describes the type of checkpoints that may occur during the POST portion of the BIOS :

Checkpoint	Description
01-0F	SEC Status Codes & Errors
10-2F	PEI execution up to and including memory detection
30-4F	PEI execution after memory detection
50-5F	PEI errors
60-CF	DXE execution up to BDS
D0-DF	DXE errors
E0-E8	S3 Resume (PEI)
E9-EF	S3 Resume errors (PEI)
F0-F8	Recovery (PEI)
F9-FF	Recovery errors (PEI)
0	Not used
1	Power on. Reset type detection (soft/hard).
2	AP initialization before microcode loading
3	North Bridge initialization before microcode loading
4	South Bridge initialization before microcode loading
5	OEM initialization before microcode loading
6	Microcode loading
7	AP initialization after microcode loading
8	North Bridge initialization after microcode loading
9	South Bridge initialization after microcode loading
A	OEM initialization after microcode loading
B	Cache initialization
C-D	Reserved for future AMI SEC error codes
E	Microcode not found
F	Microcode not loaded
10	PEI Core is started
11	Pre-memory CPU initialization is started
12	Pre-memory CPU initialization (CPU module specific)
13	Pre-memory CPU initialization (CPU module specific)
14	Pre-memory CPU initialization (CPU module specific)
15	Pre-memory North Bridge initialization is started
16	Pre-Memory North Bridge initialization (North Bridge module specific)
17	Pre-Memory North Bridge initialization (North Bridge module specific)
18	Pre-Memory North Bridge initialization (North Bridge module specific)
19	Pre-memory South Bridge initialization is started
1A	Pre-memory South Bridge initialization (South Bridge module specific)
1B	Pre-memory South Bridge initialization (South Bridge module specific)
1C	Pre-memory South Bridge initialization (South Bridge module specific)
1D-2A	OEM pre-memory initialization codes
2B	Memory initialization. Serial Presence Detect (SPD) data reading
2C	Memory initialization. Memory presence detection
2D	Memory initialization. Programming memory timing information
2E	Memory initialization. Configuring memory
2F	Memory initialization (other).
30	Reserved for ASL (see ASL Status Codes section below)
31	Memory Installed
32	CPU post-memory initialization is started
33	CPU post-memory initialization. Cache initialization
34	CPU post-memory initialization. Application Processor(s) (AP) initialization

35	CPU post-memory initialization. Boot Strap Processor (BSP) selection
36	CPU post-memory initialization. System Management Mode (SMM) initialization
37	Post-Memory North Bridge initialization is started
38	Post-Memory North Bridge initialization (North Bridge module specific)
39	Post-Memory North Bridge initialization (North Bridge module specific)
3A	Post-Memory North Bridge initialization (North Bridge module specific)
3B	Post-Memory South Bridge initialization is started
3C	Post-Memory South Bridge initialization (South Bridge module specific)
3D	Post-Memory South Bridge initialization (South Bridge module specific)
3E	Post-Memory South Bridge initialization (South Bridge module specific)
3F-4E	OEM post memory initialization codes
4F	DXE IPL is started
50	Memory initialization error. Invalid memory type or incompatible memory speed
51	Memory initialization error. SPD reading has failed
52	Memory initialization error. Invalid memory size or memory modules do not match.
53	Memory initialization error. No usable memory detected
54	Unspecified memory initialization error.
55	Memory not installed
56	Invalid CPU type or Speed
57	CPU mismatch
58	CPU self test failed or possible CPU cache error
59	CPU micro-code is not found or micro-code update is failed
5A	Internal CPU error
5B	reset PPI is not available
5C-5F	Reserved for future AMI error codes
E0	S3 Resume is stared (S3 Resume PPI is called by the DXE IPL)
E1	S3 Boot Script execution
E2	Video repost
E3	OS S3 wake vector call
E4-E7	Reserved for future AMI progress codes
E0	S3 Resume is stared (S3 Resume PPI is called by the DXE IPL)
E8	S3 Resume Failed in PEI
E9	S3 Resume PPI not Found
EA	S3 Resume Boot Script Error
EB	S3 OS Wake Error
EC-EF	Reserved for future AMI error codes
F0	Recovery condition triggered by firmware (Auto recovery)
F1	Recovery condition triggered by user (Forced recovery)
F2	Recovery process started
F3	Recovery firmware image is found
F4	Recovery firmware image is loaded
F5-F7	Reserved for future AMI progress codes
F0	Recovery condition triggered by firmware (Auto recovery)
F1	Recovery condition triggered by user (Forced recovery)
F2	Recovery process started
F3	Recovery firmware image is found
F4	Recovery firmware image is loaded
F5-F7	Reserved for future AMI progress codes
F8	Recovery PPI is not available
F9	Recovery capsule is not found
FA	Invalid recovery capsule

FB-FF	Reserved for future AMI error codes
1	Memory not Installed
1	Memory was installed twice (InstallPeiMemory routine in PEI Core called twice)
2	Recovery started
3	DXEIPL was not found
3	DXE Core Firmware Volume was not found
7	Reset PPI is not available
4	Recovery failed
4	S3 Resume failed
60	DXE Core is started
61	NVRAM initialization
62	Installation of the South Bridge Runtime Services
63	CPU DXE initialization is started
64	CPU DXE initialization (CPU module specific)
65	CPU DXE initialization (CPU module specific)
66	CPU DXE initialization (CPU module specific)
67	CPU DXE initialization (CPU module specific)
68	PCI host bridge initialization
69	North Bridge DXE initialization is started
6A	North Bridge DXE SMM initialization is started
6B	North Bridge DXE initialization (North Bridge module specific)
6C	North Bridge DXE initialization (North Bridge module specific)
6D	North Bridge DXE initialization (North Bridge module specific)
6E	North Bridge DXE initialization (North Bridge module specific)
6F	North Bridge DXE initialization (North Bridge module specific)
70	South Bridge DXE initialization is started
71	South Bridge DXE SMM initialization is started
72	South Bridge devices initialization
73	South Bridge DXE Initialization (South Bridge module specific)
74	South Bridge DXE Initialization (South Bridge module specific)
75	South Bridge DXE Initialization (South Bridge module specific)
76	South Bridge DXE Initialization (South Bridge module specific)
77	South Bridge DXE Initialization (South Bridge module specific)
78	ACPI module initialization
79	CSM initialization
7A-7F	Reserved for future AMI DXE codes
80-8F	OEM DXE initialization codes
90	Boot Device Selection (BDS) phase is started
91	Driver connecting is started
92	PCI Bus initialization is started
93	PCI Bus Hot Plug Controller Initialization
94	PCI Bus Enumeration
95	PCI Bus Request Resources
96	PCI Bus Assign Resources
97	Console Output devices connect
98	Console input devices connect
99	Super IO Initialization
9A	USB initialization is started
9B	USB Reset
9C	USB Detect
9D	USB Enable

9E-9F	Reserved for future AMI codes
A0	IDE initialization is started
A1	IDE Reset
A2	IDE Detect
A3	IDE Enable
A4	SCSI initialization is started
A5	SCSI Reset
A6	SCSI Detect
A7	SCSI Enable
A8	Setup Verifying Password
A9	Start of Setup
AA	Reserved for ASL (see ASL Status Codes section below)
AB	Setup Input Wait
AC	Reserved for ASL (see ASL Status Codes section below)
AD	Ready To Boot event
AE	Legacy Boot event
AF	Exit Boot Services event
B0	Runtime Set Virtual Address MAP Begin
B1	Runtime Set Virtual Address MAP End
B2	Legacy Option ROM Initialization
B3	System Reset
B4	USB hot plug
B5	PCI bus hot plug
B6	Clean-up of NVRAM
B7	Configuration Reset (reset of NVRAM settings)
B8-BF	Reserved for future AMI codes
C0-CF	OEM BDS initialization codes
D0	CPU initialization error
D1	North Bridge initialization error
D2	South Bridge initialization error
D3	Some of the Architectural Protocols are not available
D4	PCI resource allocation error. Out of Resources
D5	No Space for Legacy Option ROM
D6	No Console Output Devices are found
D7	No Console Input Devices are found
D8	Invalid password
D9	Error loading Boot Option (LoadImage returned error)
DA	Boot Option is failed (StartImage returned error)
DB	Flash update is failed
DC	Reset protocol is not available
4	Some of the Architectural Protocols are not available
5	No Console Output Devices are found
5	No Console Input Devices are found
1	Invalid password
6	Flash update is failed
7	Reset protocol is not available
8	Platform PCI resource requirements cannot be met
01	System is entering S1 sleep state
02	System is entering S2 sleep state
03	System is entering S3 sleep state
04	System is entering S4 sleep state