



User's Manual

Sapphire Pure Platinum Z77/Z77K

Intel Z77 / LGA1155 Mainboard

TRADEMARK

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These specifications are subject to change without notice.

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Federal Communications Commission (FCC) Statement

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with instructions contained in this manual, may cause harmful interference to radio and television communications. However, there is no guarantee that interference will not occur in a particular installation.

If this product 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 receiver.
- Connect the product into 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.

 Note1: Connecting this device to peripheral devices that do not comply with Class B requirements, or using an unshielded peripheral data cable, could also result in harmful interference to radio or television reception

Note2: The user is cautioned that any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this product.

Note3: To ensure that the use of this product does not contribute to interference, it is necessary to use shielded I/O cables

CE: Radiation of EN 55022 & Immunity of EN 55024

Waste Electrical and Electronic Equipment (WEEE) Statement

To protect the global environment, this product must be sent to separate collection facilities for recovery and recycling.



DISPOSAL

Do not dispose of this product as unsorted municipal waste. Collect such waste separately for special treatment.



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Chapter 1 Introduction

1-1 Mainboard Specifications

CPU

- Supports Intel® Core i7/i5/i3 series processor in LGA1155 package
- Supports Intel® Turbo Boost technology, Hyper-Threading technology

Chipset

- Intel® Z77 chipset

Graphics

- Intel® HD graphic
- Four independent displays supporting concurrent display of either two combination of HDMI, DVI, VGA and Display Port

Port	Supported resolution
VGA	2048x1536@75MHz
DVI-D	1920x1200@60MHz
HDMI	1920x1200@60MHz
Display Port	2560x1600@60MHz

System Memory

- Four 240-pin DDR3 SDRAM DIMM sockets
- Supports 1.5v DDR3-1066/ 1333/ 1600+ DIMMs with dual channel architecture
- Supports x16 and x8 DIMMs, non-ECC, unbuffered DIMMs
- Supports up to 32GB system memory

USB Ports

- Ten USB 2.0 ports (four at rear panel, six onboard headers), supporting transfer speed up to 480Mbps
- Four USB 3.0 ports (two at rear and two onboard headers) backward compatible with USB 2.0, supporting transfer speeds up to 4.8Gbps
- Supports wake-up from S1, S3 and S4 modes
- Support power charge function
 - Front panel 2 USB 3.0 ports also support power charge function under S5 mode

SATA Ports

- Two SATA3 ports with 6Gb/s data transfer rate and four SATA2 ports with 3Gb/s data transfer rate
- Support Intel® Rapid Start Technology with RAID 0, 1, 10 and 5
- Supports Intel® Smart Response Technology
- Supports AHCI (Advanced Host Controller Interface)

Onboard LAN

- One Gigabit Ethernet from Realtek® RTL8111F Gigabit controller
- One Gigabit Ethernet from Killer E2200 Gigabit controller (Optional)

Onboard Audio

- Supports 8-channel High-Definition audio from Realtek ALC892 codec
- Supports rear panel Optical S/PDIF output
- Supports Jack-detection function

Expansion Slots

- Three PCI-Express 3.0 x16 slots
 - One PCI-Express 2.0 x16 slots
 - Two PCI-Express 2.0 x1 slots
 - Supports AMD® CrossFireX™ Technology
- * Please refer to detail configuration at 2-6 Installing Expansion Cards

I/O

- Onboard Fintek F71889A LPC bus I/O controller
- Supports Hardware Monitoring for fan speed, CPU and system temperature

Back Panel I/O Ports

- 1 x PS/2 Keyboard/Mouse port
- 4 x USB 2.0 ports
- 1 x Optical S/PDIF Out connector
- 1 x HDMI port
- 1 x Display port
- 1 x VGA port
- 1 x DVI-D port
- 2 x RJ45 LAN ports (one for optional)

-
- 2 x USB 3.0 ports
 - 6 Audio jacks

Internal I/O Connectors

- 1 x 24-pin ATX power connector
- 1 x 8-pin ATX 12V power connector
- 1 x 4-pin power connector
- 2 x SATA3 connectors
- 4 x SATA2 connectors
- 6 x USB2.0 headers
- 2 x USB3.0 headers
- 1 x Front Panel header
- 1 x S/PDIF header
- 1 x Front Audio header
- 1 x Serial Port header
- 1 x 4-pin CPU Fan header
- 5 x 3-pin Fan headers

BIOS

- 64Mb SPI Flash with AMI based BIOS
- User Friendly graphics interface QBIOS (Quick Control UEFI BIOS)
- S_BIOS easily update and back up at BIOS control panel
- Supports ACPI (Advanced Configuration and Power Interface)
- Dual BIOS with select switch

Special Features

- Onboard diagnostic 7-Segment LED with CPU temperature display
- Onboard buttons include Clear CMOS, RESET and POWER
- Supports CPU Power Vcore Load-line adjust function
- Supports Windows based OC utility "Trixx" and Win7 HW monitor gadget tool
- USB power charge utility supports all USB ports under Windows 7
- 8+2+2 phase power design (VCore, Vtt and VDIMM)

Form Factor







➤ ATX form factor of 305mm x 245mm

Operating systems:

➤ Supports Windows Vista and Windows 7

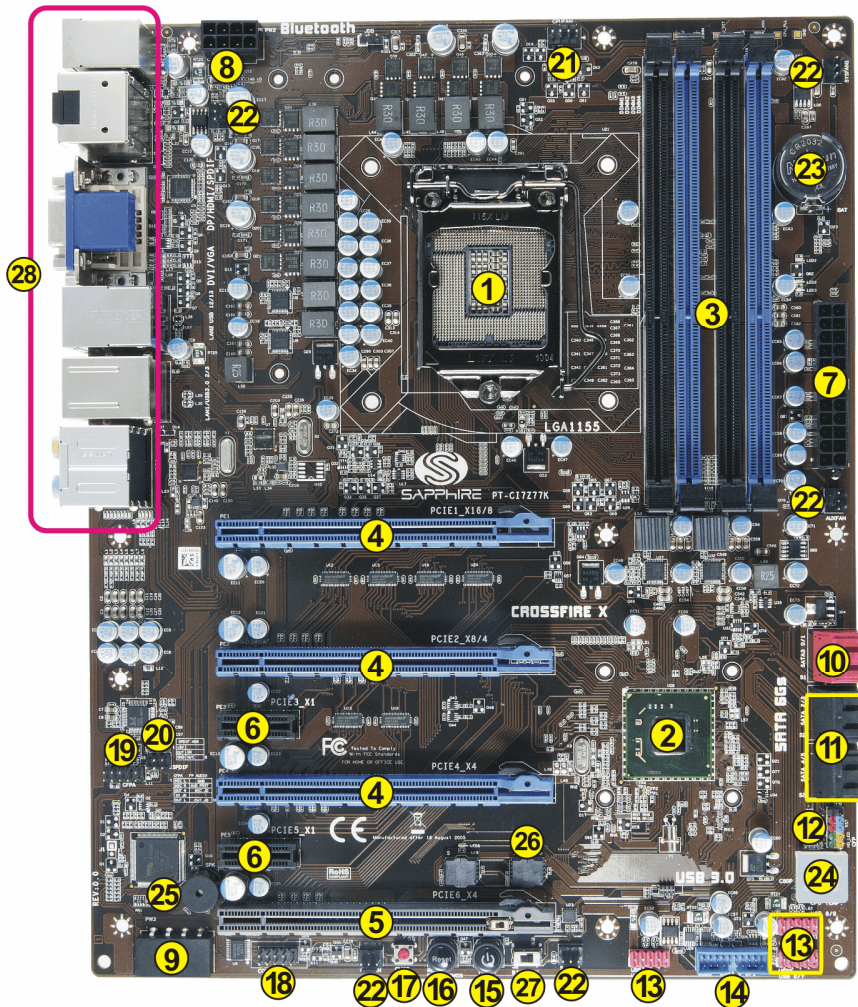
1-2 Package Contents

Your Sapphire mainboard comes with the following accessories.

1. Mainboard	2. I/O Shield
	
3. Quick Installation Guide	4. Driver DVD
	
5. USB3.0 Front Panel Cable (Optional)	6. SATA Data Cable *6
	

1-3 Mainboard Layout

The following figure shows the location of components on the mainboard. See following page for description.



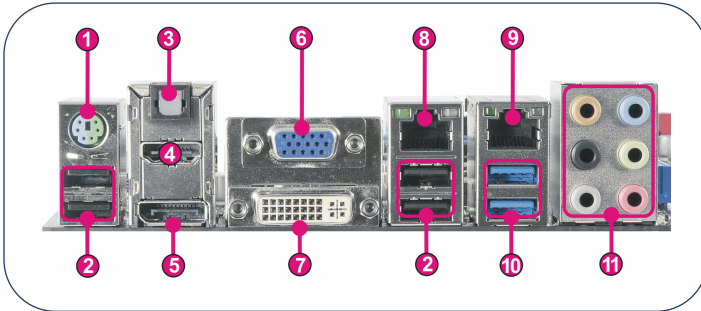
Note:

Picture is for reference only, actual board may be slightly different.

Item	Component description
1	CPU Socket 1155
2	Intel Z77 Chip
3	DDR3 DIMM Slots 1-4
4	PCI-E 3.0 x16 Slots *3
5	PCI-E 2.0 x16 Slots *1
6	PCI-E 2.0 x1 Slot *2
7	24-Pin ATX Power Connector
8	8-pin ATX_12V Power Connector
9	4-pin Power Connector
10	SATA3 Connectors *2
11	SATA2 Connectors *4
12	Front Panel Header
13	USB 2.0 Header *6
14	USB 3.0 Header *2
15	Power Button
16	Reset Button
17	Clear CMOS Button
18	Serial port Header
19	Front Panel Audio Header
20	S/PDIF Header
21	CPU Fan Header
22	3-pin Fan Header *5
23	Mainboard Battery
24	Debug LED Display
25	PC Speaker
26	64Mb SPI Flash
27	Dual BIOS Switch
28	Back Panel Connectors (see below for detail)

I/O Back Panel

The I/O back panel for this mainboard is shown below. When installing the mainboard into the computer case, use the bundled I/O shield to protect this back panel.



1. PS/2 Keyboard/Mouse Port
This connector is used for a keyboard or mouse. You can plug a PS/2 keyboard or mouse directly into this connector.
2. USB 2.0 Ports (four)
The mainboard provides an OHCI (Open Host Controller Interface) Universal Serial Bus root for attaching USB devices such as a keyboard, mouse or other USB-compatible devices. Supports data transfer rates up to 480Mb/s.
3. Optical S/PDIF-Out
This SPDIF (Sony & Philips Digital Interconnect Format) connector is used for digital audio transmission to external speakers/amplifier through an optical fiber cable.
4. The HDMI (High-Definition Multimedia Interface) provides an all-digital audio/video interface to transmit the uncompressed audio/video signals and is HDCP compliant. Connect the HDMI audio/video device to this port.
5. Display Port
The DisplayPort is a digital display interface standard. This connector is used to connect a monitor with DisplayPort inputs.
6. VGA Port
The VGA female port provides connection to analogue VGA monitors.
7. DVI-D Port
The DVI-D (Digital Visual Interface-Digital) port provides a high-speed

digital interconnection between the computer and its display device. Connect a monitor that supports DVI-D connection to this port. The DVI-D port does not support analogue VGA monitors using a passive DVI to VGA adapter.

Dual Display Configurations:

This mainboard provides four ports for video output: VGA, DVI-D, HDMI and Display port. It displays combination of either two. Please refer to table below for dual display configurations supported.

Supported configurations
VGA + DVI-D
VGA + Display Port
VGA + HDMI
DVI-D + Display Port
DVI-D + HDMI
Display Port + HDMI

- 8. LAN Ports with LEDs by Killer E2200 (Optional)
- 9. LAN Ports with LEDs by Realtek® RTL8111F

The mainboard provides standard RJ-45 jacks for connecting to a Local Area Network (LAN). Two LEDs are built into the RJ-45 LAN connector. These LEDs indicate the status of the LAN.



LED	LED Color	LED state	Indicates
A	Green	Off	LAN link is not established
		On	LAN link is established
		Blinking	LAN activity is occurring
B	N/A	Off	10 Mb/s data rate
	Green	On	100 Mb/s data rate
	Yellow	On	1000 Mb/s data rate

- 10. USB 3.0 ports (two)

USB 3.0 ports are backward compatible with USB 2.0 devices. Supports data transfer rates up to 4.8Gb/s (SuperSpeed).

11. Audio ports

This mainboard provides 2, 6 or 8 channel audio. It is easy to differentiate between the audio functions by referring to the color of the jacks.

Ports	2 channel	6 channel	8 channel
Blue	Line-In	Line-In	Line-In
Lime	Line-Out	Front Stereo-Out	Front Stereo-Out
Pink	Mic-In	Mic-In	Mic-In
Orange	--	Center/Subwoofer	Center/Subwoofer
Black	--	Rear Stereo-Out	Rear Stereo-Out
Gray	--	--	Side Stereo-Out

Chapter 2 Installation

2-1 Before You Begin

Please take note of all precautions before you install anything on to the mainboard or change any of the mainboard settings.

Turn off the power to your system and discharge your body's static electric charge by touching a grounded surface—for example, the metal surface of the power supply—before performing any hardware procedure.

The manufacturer assumes no liability for any damage, caused directly or indirectly, by improper installation of any components by unauthorized service personnel. If you do not feel comfortable performing the installation, consult a qualified computer technician.

Damage to system components, the mainboard, and injury to you may result if power is applied during installation.

2-2 Installing the I/O Shield

The mainboard comes complete with an I/O shield. When installed in the chassis, the shield blocks radio frequency transmissions, protects internal components from dust and foreign objects, and promotes correct airflow within the chassis.

Install the I/O shield before installing the mainboard in the chassis. Place the shield inside the chassis. Press the shield into place so that it fits tightly and securely. If the shield does not fit, obtain a properly sized shield from the chassis supplier.

2-3 Securing to the Chassis


When installing the mainboard, you have to secure the mainboard into the chassis by fastening with nine screws. Please refer to your chassis manual for instructions.

2-4 Installing the CPU and Cooler

Follow the steps below to install the CPU & cooler correctly.

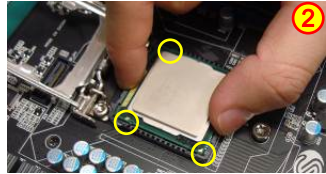
1. Open the socket lever by pushing the lever down and away from the socket. Remove the protective socket cover from the socket. Do not touch the socket contacts. **Do not touch the socket contacts to avoid damaging.**



 Note:

Do not discard the protective socket cover. Be sure to always replace the cover unless the CPU is installed.

2. Align the CPU notches to the socket protrusions. Place CPU straight down without tilting or sliding it.



3. Close the load plate and engage the socket lever.



4. To install fan heatsink, align the holes on the mainboard. Press the four hooks down to fasten the cooler. You will hear a "click" upon full engagement. Gently rotate the cap clockwise 1/4 turn to fasten the heatsink onto the mainboard.



5. Connect the 4-wire fan cable to the 4-pin CPUFAN header on the mainboard.



Note:

Pictures are for installation reference only, actual boards may be slightly different.

2-5 Installing System Memory

This mainboard has four 240-pin DIMM sockets for DDR3 memory. These slots support 1GB, 2GB, 4GB and 8GB DDR3 DIMMs up to max. 32GB.

Make sure that you install memory modules of the same type and density in the different channel DIMM slots for Dual-Channel mode.

There must be at least one memory bank populated to ensure normal operation and you can insert the memory module into any of the DIMM slots.

Memory configurations

Use the following the recommendations for installing memory.

DIMM Quantity \ Location	1 DIMM (Single Channel)	2 DIMMs (Dual Channel)	3 DIMMs (Dual Channel)	4 DIMMs (Dual Channel)
DIMM#1 (Black)	--	--	V	V
DIMM#2 (Blue)	V	V	V	V
DIMM#3 (Black)	--	--	--	V
DIMM#4 (Blue)	--	V	V	V

(" V " = Memory installed, "--" = No memory installed)



Memory Installation

DDR3 and DDR2 memory modules are physically different. Please only install DDR3 DIMMs in this mainboard.

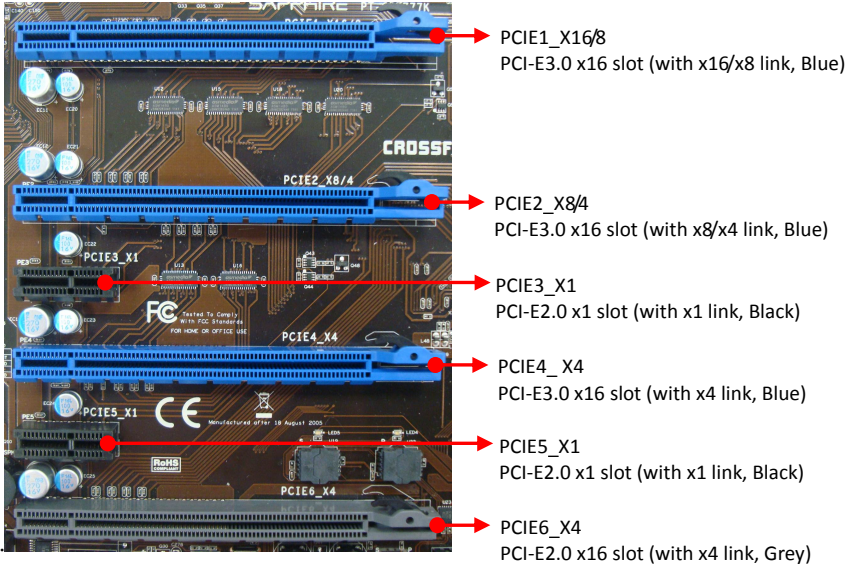
To install the DIMM, follow these steps:

1. Pull both clips on either side of the slot outwards. Align the DIMM module with the slot.
2. Press modules straight down until the plastic clips close and the module fits tightly into the DIMM slot. Push clips inwards to make sure they are in place and the memory is securely fitted.

2-6 Installing Expansion Cards

The mainboard provides three PCI Express 3.0 x16 slots, one PCI Express 2.0 x16 slot and two PCI Express 2.0 x1 slots.

Note: The PCI-E Gen3 function will be available when using PCIe 3.0 compliant devices.



Note:

For support of multiple graphic cards, you can connect power supply to 4-pin power connector to ensure sufficient power supply to the PCI-E slots for stable working.

Please refer to PCI Express card configuration table.

Slot	Channel	Bandwidth
PCIE1	CPU	G3 x16/x8
PCIE2	CPU	G3 x8/x4
PCIE3	PCH	G2 x1
PCIE4	CPU	G3 x4
PCIE5	PCH	G2 x1
PCIE6	PCH	G2 x4

Installing a PCI Express card:

1. Place the card in an available PCI Express slot and press down on the card until it is completely seated in the slot. If the card is not seated properly, it could cause a short across the pins.
2. Secure the card's metal bracket to the back panel of the chassis with a screw.

The design of this motherboard supports AMD CrossFireX™ technology for support of multiple graphic cards. Please refer to the location of slots and recommended configuration table for PCI-E operating mode to get the best performance possible.

Recommended configuration table				
Slot location	PCIE1_x16/x8 (Blue)	PCIE2_x8/x4 (Blue)	PCIE4_x4 (Blue)	PCIE6_x4 (Grey)
VGA card				
1 VGA card	x16			
2 VGA cards	x8	x8		
3 VGA cards	x8	x8		x4
3 VGA cards (Corei Gen3)	x8	x4	x4	
4 VGA cards (Corei Gen3)	x8	x4	x4	x4

Note:

- This PCIE4_x4 slot cannot work when using Corei Gen2 processor.
 - If you use the Corei Gen2 processor, the speed of PCI-E 3.0 slot will slow down to PCI-E 2.0 specification.
-

2-7 Connecting Cables

This section takes you through all the necessary connections on the mainboard.

Connecting Power Supply Cables

- 24-pin ATX Power

PW1 is the main power supply connector. Make sure that the power supply cable pins are properly aligned with the connector on the mainboard. Firmly plug the power supply cable into the connector and make sure it is secure.

📌 Note:

If you'd like to use 20-pin ATX power supply, please plug in your power supply cable aligned with pins 1 & 13. The 24-pin main power connector is backwardly compatible with ATX power supplies with 20-pin connectors.

- 8-pin ATX 12V Power

PW2, the 8-pin ATX 12V power connector, is used to provide power to the CPU. Align the power plug to the connector and press firmly until seated.

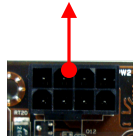
- 4-pin Power

PW3, the 4-pin power connector, is used to provide extra 12V /5V power to your system. When installing multiple graphic cards, you can connect power supply here to ensure sufficient power supply to the PCI-E slots.

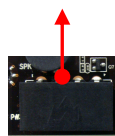
24-pin ATX Power
connector



8-pin ATX Power
connector



4-pin Power
connector

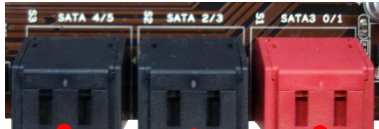


Connecting Serial ATA (SATA) Cables

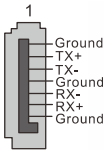
SATA cables support the Serial ATA protocol. Each cable can be used to connect one SATA drive to the mainboard.

The S1 to S3 connectors are controlled by the Intel Z77 chip and support RAID 0, 1, 10, 5 functions.

- Red coloured connector (S1) works at speeds of up to 6G/s.
- Black coloured connectors (S2 and S3) work at speeds of up to 3G/s.



S3: SATA 2.0	S2: SATA 2.0	S1: SATA 3.0
SATA 4 (bottom) SATA 5 (top)	SATA2 (bottom) SATA3 (top)	SATA3 0 (bottom) SATA3 1 (top)



Attach one end of the SATA cable to one of the SATA connectors on board and attach the other end of the cable to the SATA drive

Connecting to the Internal Headers and Connectors

Front Panel Header

The front panel header on this motherboard is used to connect the front panel switches and LEDs.

▶ PWR_LED

Attach the front panel power LED cable to these two pins of the connector. The Power LED indicates the system's status.

System Status	Power LED indicates
On	The LED is on
Off	The LED is off
S1	The LED is on
S3	The LED will blink
S4	The LED is off

▶ PW_ON

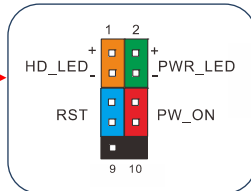
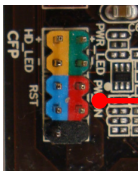
Attach the power button cable from the case to these two pins. Pressing the power button on the front panel turns the system on and off rather than using the onboard button.

▶ HD_LED

Attach the hard disk drive indicator LED cable to these two pins. The HDD indicator LED indicates the activity status of the hard disks.

▶ RESET

Attach the Reset switch cable from the front panel of the case to these two pins. The system restarts when the RESET switch is pressed.



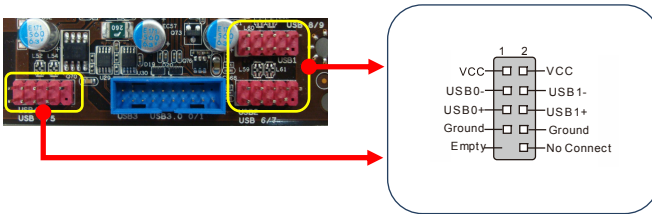
Header	Pin	Signal
HD_LED	1	HD_PWR
	3	HD Active
PWRLED	2	PWR LED+
	4	PWR LED-
RESET	5	Ground
	7	RST BTN
PWRSW	6	PWR BTN
	8	Ground
No Connect	9	+5V
Empty	10	Empty

USB2.0 Headers

This mainboard contains four (4) USB 2.0 ports that are exposed on the rear panel of the chassis. This mainboard also contains three 10-pin onboard header connectors that can be used to connect to six (6) external USB 2.0 devices.

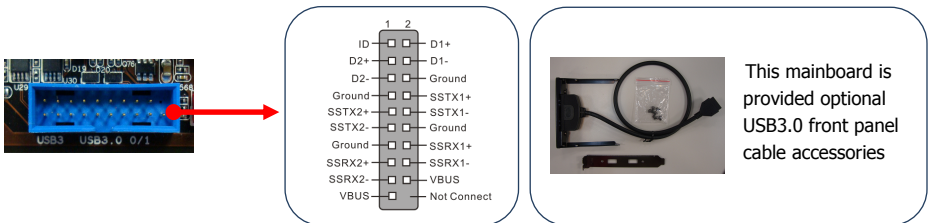
Refer to the following steps:

1. Secure the bracket to either the front or rear panel of your chassis (not all chassis are equipped with the front panel option).
2. Connect the cable(s) to the USB 2.0 header on the mainboard.



USB3.0 Headers

This mainboard contains Two (2) USB 3.0 ports that are exposed on the rear panel of the chassis. This mainboard also contains one onboard header connectors that can be used to connect to two (2) external USB 3.0 devices.



For rear panel, refer to the following steps:

1. Secure the bracket to rear panel of your chassis.
2. Connect the cable(s) to the USB 3.0 header on the mainboard.

For front panel, refer to the following steps:

1. Remove the cover plate from the selected drive bay.
2. Push the USB3.0 cable into the drive bay. Align the screw holes with the appropriate holes in the drive bay and tighten the mounting screws.
3. Connect the USB3.0 connector of cable to the USB3.0 header on the mainboard.

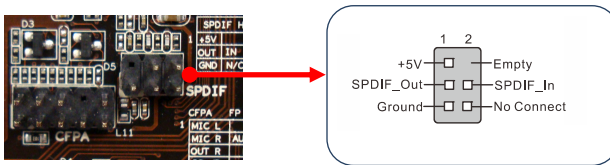
CFPA Header

This header allows you to connect the front panel audio. The audio connector supports HD audio standard.



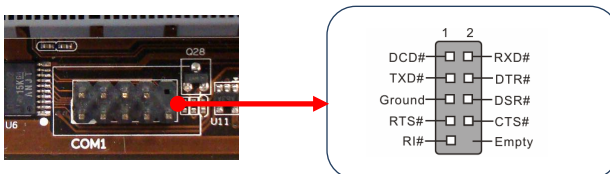
S/PDIF Header

This header is used to connect S/PDIF (Sony & Philips Digital Interconnect Format) interface for digital audio transmission.



Serial Port Header

The Serial port header (COM1) can provide one serial port via an optional COM port cable.

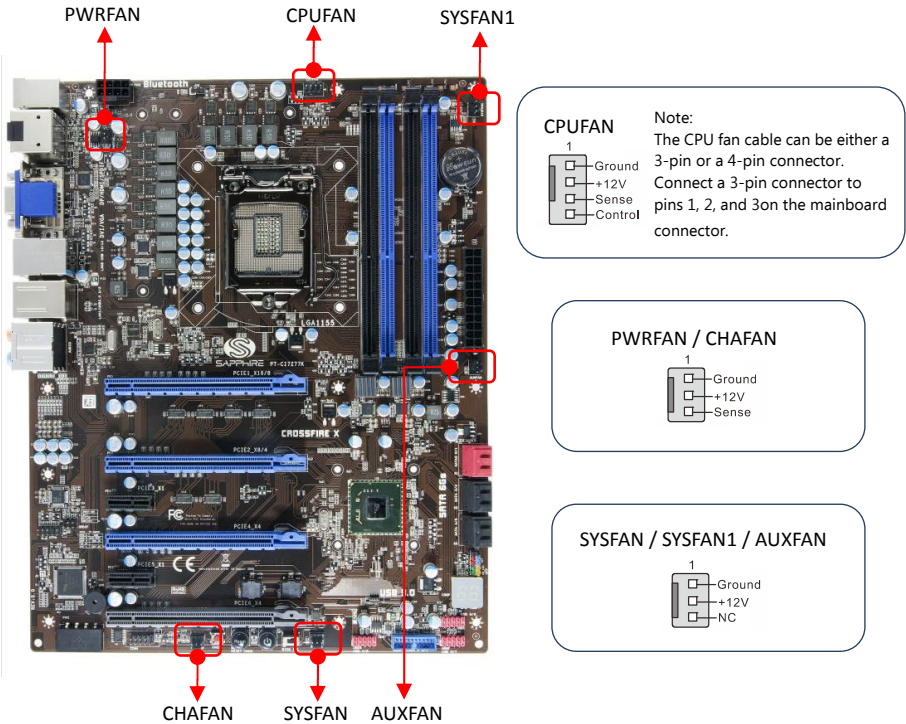


Note:

The pin definition of header and standard DB9 male pin out is different.

Fan Headers

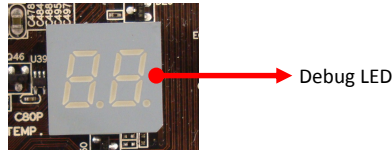
There are six fan headers (CPUFAN, SYSFAN, SYSFAN1, PWRFAN, CHAFAN, AUXFAN) on the motherboard. Three of these fans (CPUFAN, PWRFAN, CHAFAN) can be speed detected/controlled and displayed in the Hardware Health Configuration section of the CMOS Setup. The fans are automatically turned off after the system enters S3, S4 or S5 mode.



2-8 Diagnostics LED

This mainboard provides a two-digit POST code to show why the system may be failing to boot. It is useful during a troubleshooting situation. This Debug LED will also display the current CPU temperature after the system has fully booted into the operating system.

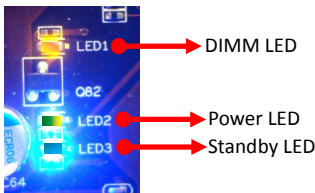
Please find a list of debug codes at the end of this manual.



2-9 LED Status Indicators

This mainboard provides three LEDs to indicate the system's status.

- DIMM LED (LED1, Yellow): When the Memory slot is functional, this LED is on.
- POWER LED (LED2, Green): When the System is powered on, this LED is on.
- STANDBY LED (LED3, Blue): When the System is in Standby Mode, this LED is on. This LED will remain on as long as the motherboard is receiving constant power.



2-10 Onboard Buttons

These onboard buttons include Clear CMOS, RESET and POWER, which allow you to easily clear the CMOS, reset the system and turn on/off the system.

Clear CMOS Button

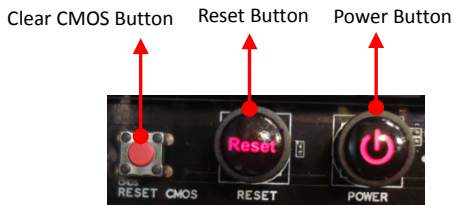
The mainboard uses the CMOS RAM to store some of the system configuration. The CMOS can be cleared by pressing the Clear CMOS button.

Reset and Power Button

These onboard buttons allow you to easily turn on/off the system and allow for easy debugging and testing of the system during troubleshooting situations.

The Reset button with LED indicates the activity status of the hard disk drives and will blink accordingly.

The Power button with LED indicates the system's status. When the system is powered on, the LED blinks red.



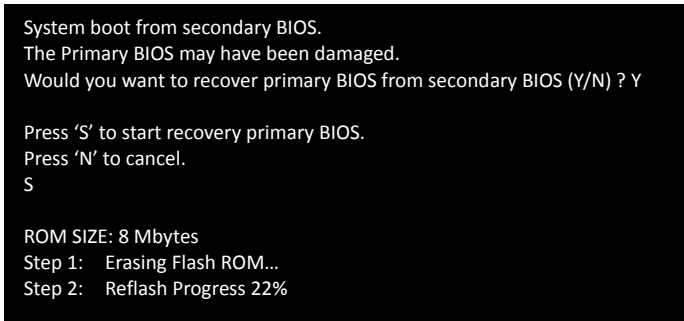
2-11 Dual BIOS Switch

- **Recover BIOS:**

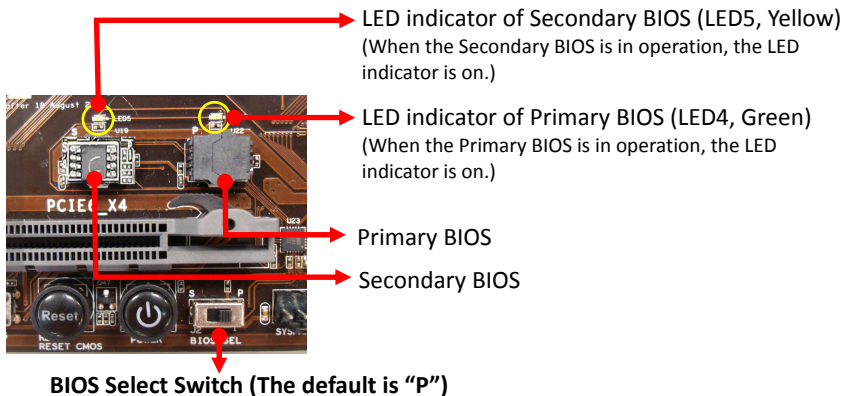
This mainboard includes dual onboard BIOS, (Primary and Secondary BIOS), When the primary BIOS is corrupted or has failed, the system will **automatically** switch to secondary BIOS to boot to ensure normal system operation.

Please refer to the following steps:

1. Turn on the system power.
2. The system can detect and automatically switch to secondary BIOS to boot when the primary BIOS is failed, no matter BIOS switch position.
3. Follow the instructions below to update the Primary BIOS.



Note: It is recommended that select 'S' to recovery primary BOIS,
Otherwise, system will repeat the above steps on the next boot.



- **Flash BIOS:**

If the primary (secondary) BIOS is corrupted or outdated, you can use the USB pen drive or AMI Windows flash utility to do flashing BIOS process to recover the primary (secondary) BIOS.

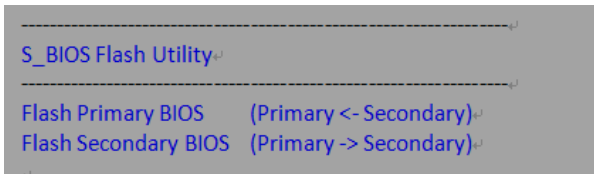
Flash primary BIOS:

Make sure the BIOS select switch is at "P" position and power on. Flash the BIOS using either USB pen drive under DOS or AMI Windows flash utility under Windows.

Flash secondary BIOS:

Make sure the BIOS select switch is at "S" position and power on. Flash the BIOS using either USB pen drive under DOS or AMI Windows flash utility under Windows.

- **Flash BIOS from within BIOS:**



S_BIOS Flash Utility

The BIOS update tool, S_BIOS, allows you to update the system BIOS without having to enter MS-DOS or Windows environment. Please refer to "4-4 S_BIOS Flash Utility" section for details.

Flash Primary BIOS

This item allows you to copy the Secondary BIOS to Primary BIOS.

Flash Secondary BIOS

This item allows you to copy the Primary BIOS to Secondary BIOS.

Chapter 3 Configuring the BIOS

This chapter provides information on the BIOS Setup program and allows you to configure the system for optimum use.

3-1 Select Boot Device

Select Boot Device Menu allows you to set the first boot device without entering BIOS Setup.

During Power On Self Test (POST), you can press the <F7> key to enter select boot device menu. The system will directly boot from the device configured in Boot Menu.



3-2 Enter BIOS Setup

The BIOS is the communication bridge between hardware and software. Correctly setting the BIOS parameters is critical to maintain optimal system performance.



Use the following procedure to change BIOS settings.

1. Power on the computer.
2. Press the or <F2> key when the following message briefly shows

upon the bottom of the display during Power On Self Test (POST).

Press F1 to continue, DEL to enter Setup.

Pressing Del takes you to the BIOS Setup Utility.

-  Note1: It is strongly recommended that you do not change the default BIOS settings. Changing some settings could damage your computer.
-  Note2: The BIOS options in this manual are for reference only. BIOS screens in manuals are usually the first BIOS version when the board is released and may be different from your purchased motherboard. Users are welcome to download the latest BIOS version from our official website

ControlKeys

Please check the following table for the function description of each Controlkey. You can also use the mouse to click your required item.

Control Key(s)	Function Description
← / →	Moves cursor left or right to select Screens
↑ / ↓	Moves cursor up or down to select items
+ / -	To change option for the selected items
<Enter>	To bring up the selected screen
<F1>	To display the General Help Screen
<F2>	To load previous values for all the settings
<F3>	To load optimal default values for all the settings
<F4>	To save changes and exit the SETUP UTILITY
<ESC>	To jump to the Exit Screen or exit the current screen

3-3 Main Menu

When entering the BIOS Setup Utility, the main menu screen appears. This main menu includes the system overview and displays the basic system configuration, such as BIOS information, memory size and system date/time.



BIOS Information

This field displays the current BIOS version, build date and ID information etc..

System Date

Allows you to set the system date. The format is <Day><Month><Date><Year>.

[Day] Weekday from Sun. to Sat., this is automatically displayed by BIOS.

[Month] The month from 1 to 12.

[Date] The date from 1 to 31 can be keyed by numeric function keys.

[Year] The year can be adjusted by users.

System Time

Allows you to set the system time. The time format is

<hour>:<minute>:<second>.

Access Level

This item is used to limit the user access level.

3-4 Performance Menu

The Performance menu allows you to specify your settings for CPU, memory, voltage control and overclocking. Press <Enter> to display the configuration options.



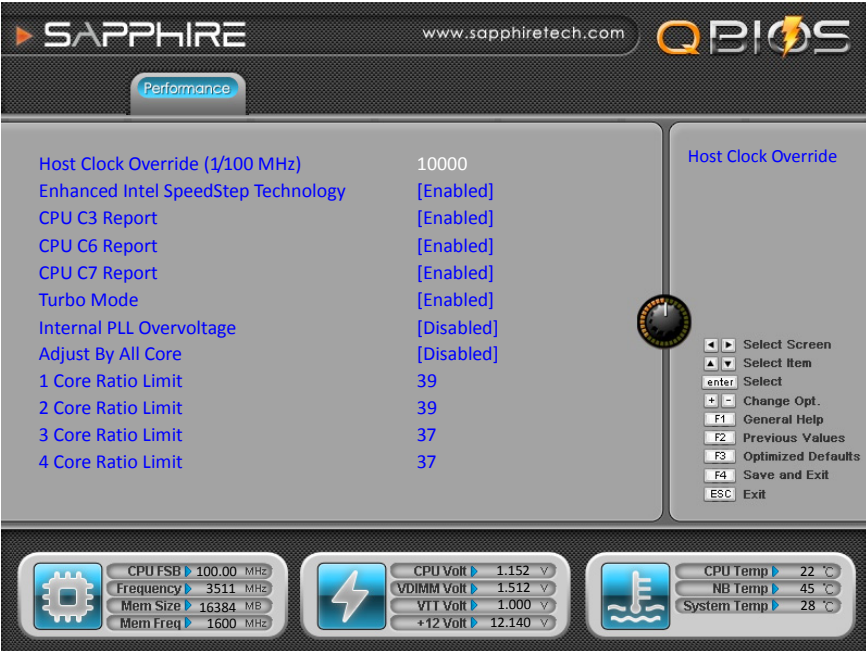
Graphics Core Ratio Limit

Allows you to set a core ratio limit for graphics.

Graphics Voltage (1/256)

Allows you to adjust the on board graphics voltage.

► CPU Configuration



SAPPHIRE www.sapphiretech.com **QBIOS**

Performance

Host Clock Override (1/100 MHz)	10000
Enhanced Intel SpeedStep Technology	[Enabled]
CPU C3 Report	[Enabled]
CPU C6 Report	[Enabled]
CPU C7 Report	[Enabled]
Turbo Mode	[Enabled]
Internal PLL Overvoltage	[Disabled]
Adjust By All Core	[Disabled]
1 Core Ratio Limit	39
2 Core Ratio Limit	39
3 Core Ratio Limit	37
4 Core Ratio Limit	37

Host Clock Override

- Select Screen
- Select Item
- Select
- Change Opt.
- General Help
- Previous Values
- Optimized Defaults
- Save and Exit
- Exit

CPU FSB 100.00 MHz
Frequency 3511 MHz
Mem Size 16384 MB
Mem.Freq 1600 MHz

CPU Volt 1.152 V
VDIMM Volt 1.512 V
VTT Volt 1.000 V
+12 Volt 12.140 V

CPU Temp 22 °C
NB Temp 45 °C
System Temp 28 °C

Host Clock Override(1/100 MHz)

Selects the value for Host Clock Override. The value range is 100MHz ~300MHz. The 1000 means 100MHz.

Enhanced Intel SpeedStep Technology

Enables the Intel[®]SpeedStep technology (EIST).

Options: Enabled, Disabled.

CPU C3 report

Enable/Disable CPU C3 (ACPI C2)report to OS

Options: Enabled, Disabled.

CPU C6 report

Enable/Disable CPU C6 (ACPI C3) report to OS

Options: Enabled, Disabled.

CPU C7 report

Enable/Disable CPU C7 (ACPI C3) report to OS

Options: Enabled, Disabled.

Turbo Mode

Enables the processor cores to run faster than marked frequency in specification condition.

Options: Enabled, Disabled.

Internal PLL Overvoltage

This feature is only support on K-SKU CPUs for overclocking, enable this function will cause the S3 resume failure.

Options: Enabled, Disabled.

Adjust By All Core

When enabled, allow you adjust the all core in OS.

Options: Enabled, Disabled.

Runtime Core Ratio Limit

This item will only appear when "Adjust By All Core" item is set to "Enabled" option.

1/2/3/4 Core Ratio Limit

Displays the 1/2/3/4 core ratio limit of CPU.

► Memory Configuration

SAPPHIRE www.sapphiretech.com **QBIOS**

Performance

Memory SPD Type	[Standard]
Memory Base Clock	[133MHz]
Memory Frequency	[1600MHz (133*12)]
CAS# Latency (tCL)	9
RAS# to CAS# Delay(tRCD)	9
Row Precharge Time(tRP)	9
RAS# Active Time(tRAS)	28
Write Recovery Time(tWR)	12
Row Refresh Cycle Time(tRFC)	128
Write to Read Delay(tWTR)	6
Active to Active Delay(tRRD)	5
Read CAS# Precharge(tRTP)	6
Four Active Windows Delay(tFAW)	24
NMode Support	[Auto]

The selection of Performance Memory Profiles which impacts memory sizing behavior.

- Select Screen
- Select Item
- enter Select
- + - Change Opt.
- F1 General Help
- F2 Previous Values
- F3 Optimized Defaults
- F4 Save and Exit
- ESC Exit

CPU FSB 100.00 MHz
Frequency 3511 MHz
Mem Size 16384 MB
Mem Freq 1600 MHz

CPU Volt 1.152 V
VDDIMM Volt 1.512 V
VTT Volt 1.000 V
+12 Volt 12.140 V

CPU Temp 22 °C
NB Temp 45 °C
System Temp 28 °C

Memory SPD Type

Allows the BIOS to read the SPD data on memory module to enhance memory performance or select manually configuring timings.

Options: Standard SPD, XMP Profile 1.

Memory Base Clock

This clock controls your memory speed and core speed based Base Clock.

Options: 100MHz, 133MHz.

Memory Frequency (MHz)

Allows you to select the system memory Frequency.

Depend on the memory base clock, the options will be varied.

Options for 100MHz:

1400 MHz (100*14), 1600 MHz (100*16), 1800 MHz (100*18), 2000 MHz (100*20), 2200 MHz (100*22), 2400 MHz (100*24), 2600 MHz (100*26), 2800 MHz (100*28).

Options for 133MHz:

1067 MHz (133*8), 1333 MHz (133*10), 1600 MHz (133*12), 1867 MHz (133*14), 2133 MHz (133*16), 2400 MHz (133*18), 2667 MHz (133*20).

CAS# Latency (tCL)

Set the CAS latency time.

Options: Auto(9), 5 ~ 15.

RAS# to CAS# Delay (tRCD)

Set the RAS to CAS Delay time for Read/Write commands to the same bank.

Options: Auto(9), 4 ~ 15.

Row Precharge Time (tRP)

Set the Row Precharge time. This is the Precharge-to-Active or Auto-to-Refresh of the same bank.

Options: Auto(9), 4 ~ 15.

RAS# Active Time (tRAS)

Set the minimum RAS# active time.

Options: Auto(28), 10 ~ 40.

Write Recovery Time (tWR)

Set the internal Write to Read recovery time.

Options: Auto(12), 5 ~ 16.

Row Refresh Cycle Time (tRFC)

Set the minimum refresh recovery time.

Options: Auto(128), 15 ~ 255.

Write to Read Delay (tWTR)

Set the internal Write to Read command delay.

Options: Auto(6), 4 ~ 8.

Active to Active Delay (tRRD)

Set the Row Active to Row Active delay.

Options: Auto(5), 4 ~ 7.

Read CAS# Precharge (tRTP)

Set the Read to Precharge delay.

Options: Auto(6), 4 ~ 8.

Four Active Windows Delay (tFAW)

Set the Four Active Windows Delay.

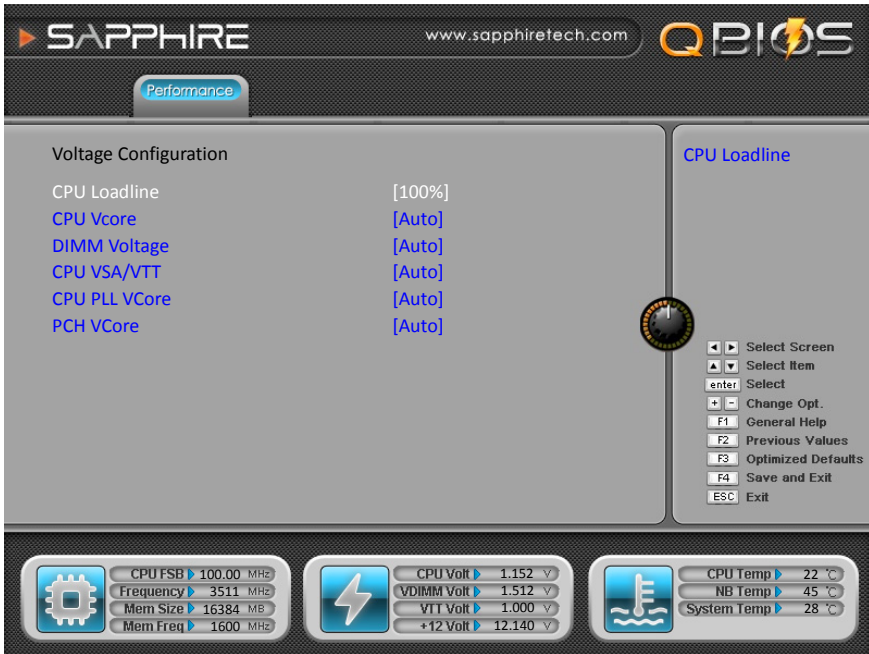
Options: Auto(24), 10 ~ 63.

NMode Support

This setting controls the DRAM command rate.

Options: Auto, 1N Mode, 2N Mode.

► Voltage Configuration



CPU Loadline

Loadline Control function is a safety measure to protect the CPU.

Options: 100%, 75%, 50%, 25%, Disabled.

CPU VCore

Allows you to adjust the CPU Vcore voltage.

Options: Auto, 1.000V ~ 1.950V in 0.005V increments.

DIMM Voltage

Allows you to adjust the DIMM voltage.

Options: Auto, 1.10V ~ 2.00V in 0.05V increments.

CPU VSA/VTT

Allows you to adjust the CPU VSA/VTT Voltage.

Options: Auto, +0.000V ~ +1.550V in 0.025V increments.

CPU PLL

Allows you to adjust the CPU PLL VCore Voltage .

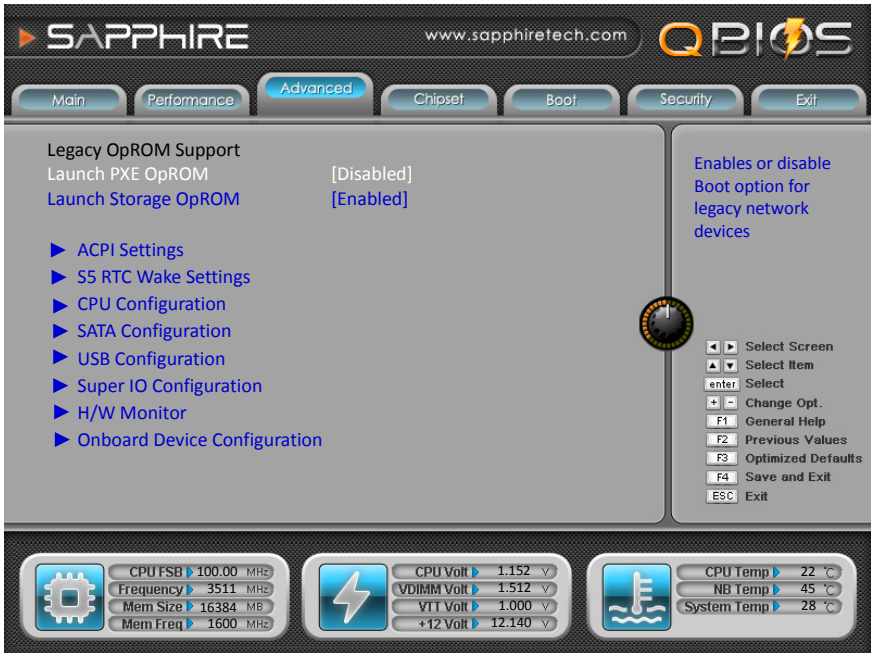
Options: Auto, 1.050V ~ 2.680V in 0.125V increments.

PCH Vcore

Allows you to adjust the Intel PCH VCore Voltage.
Options: Auto, 1.050V ~ 2.625V in 0.025 increments.

3-5 Advanced Menu

The Advanced menu items allow you to change the settings for the CPU, USB and other system devices. Press <Enter> to display the configuration options.



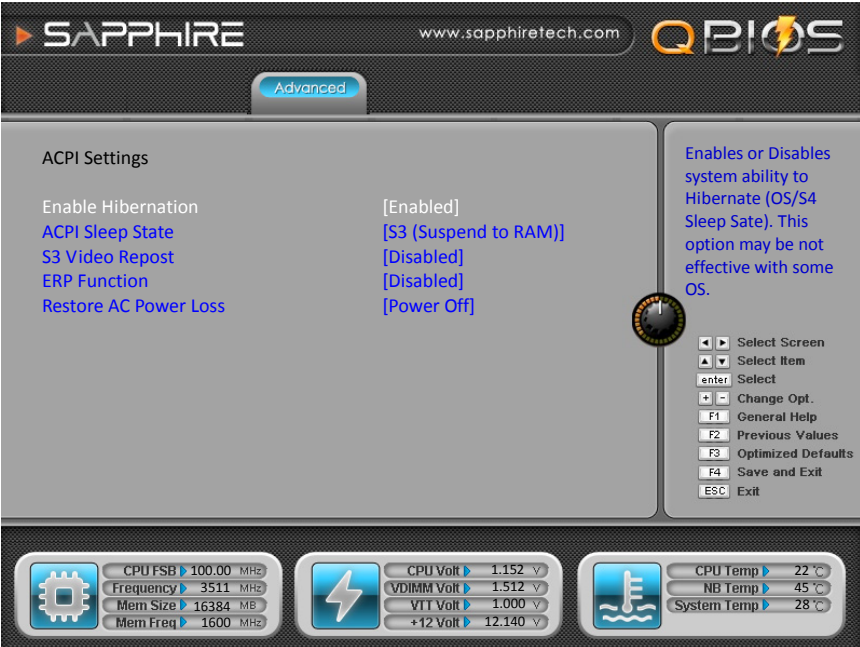
Launch PXE OpROM

Enables the Boot option for legacy network devices.
Options: Enabled, Disabled.

Launch Storage OpROM

Enables the Boot option for mass storage devices with option ROM.
Options: Enabled, Disabled.

▶ ACPI Settings



SAPPHIRE www.sapphiretech.com **QBIOS**

Advanced

ACPI Settings

Enable Hibernation [Enabled]
ACPI Sleep State [S3 (Suspend to RAM)]
S3 Video Repost [Disabled]
ERP Function [Disabled]
Restore AC Power Loss [Power Off]

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

Select Screen
Select Item
Select
Change Opt.
General Help
Previous Values
Optimized Defaults
Save and Exit
Exit

CPU FSB 100.00 MHz
Frequency 3511 MHz
Mem Size 16384 MB
Mem Freq 1600 MHz

CPU Volt 1.152 V
VDIMM Volt 1.512 V
VTT Volt 1.000 V
+12 Volt 12.140 V

CPU Temp 22 °C
NB Temp 45 °C
System Temp 28 °C

Enable Hibernation

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

Options: Enabled, Disabled.

ACPI Sleep State

Selects the power saving modes for ACPI function.

Options: Suspend Disabled, S1 (CPU Stop Clock), S3 (Suspend to RAM).

S3 Video Repost

This feature reruns the video option ROM on a boot from the S3 state.

Options: Enabled, Disabled.

ERP Function

Enables the ERP (Energy Related Products) function, allows BIOS to switch off some power at S5 state to get system ready for the ERP requirement to reduce power consumption.

Options: Enabled, Disabled.

Restore on AC Power Loss

Enables your computer to automatically restart or return to its last operating status after power returns from a power failure.

Options: Power off, Power on, Last State.

► S5 RTC Wake Settings

The screenshot shows the QBIOS Advanced settings screen. At the top, there is a 'SAPPHIRE' logo, the website 'www.sapphiretech.com', and the 'QBIOS' logo. Below the logo is a 'Advanced' tab. The main area is divided into two columns. The left column contains two settings: 'Wake systems with Fixed Time' and 'Make system with Dynamic Time', both set to '[Disabled]'. The right column contains a detailed description: 'Enable or Disable System wake on alarm event. When enabled, System will wake on the hr::min::sec specified.' Below this is a circular 'RTC' indicator. At the bottom right, there is a legend for navigation keys: Left/Right for 'Select Screen', Up/Down for 'Select Item', Enter for 'Select', '+'/'-' for 'Change Opt.', F1 for 'General Help', F2 for 'Previous Values', F3 for 'Optimized Defaults', F4 for 'Save and Exit', and ESC for 'Exit'. At the bottom of the screen, there are three status boxes: 'CPU FSB' (100.00 MHz), 'Frequency' (3511 MHz), 'Mem Size' (16384 MB), 'Mem Freq' (1600 MHz); 'CPU Volt' (1.152 V), 'VDIMM Volt' (1.512 V), 'VT1 Volt' (1.000 V), '+12 Volt' (12.140 V); and 'CPU Temp' (22 °C), 'NB Temp' (45 °C), 'System Temp' (28 °C).

Wake system with Fixed Time

Enable or disable system wake on alarm event. When enabled, system will wake on the hr:min:sec specified.

Options: Enabled, Disabled.

Wake system with Dynamic Time

Enable or disable system wake on alarm event. When enabled, system will wake on the current time + Increase minutes(s).

Options: Enabled, Disabled.

► CPU Configuration

SAPPHIRE www.sapphiretech.com QBIOS

Advanced

CPU Configuration

Intel(R) Core(TM) i7-3770K CPU @ 3.50GHz

► CPU Information

- Hyper-threading [Enabled]
- Active Processor Cores [All]
- Limit CPUID Maximum [Disabled]
- Execute Disable Bit [Enabled]
- Intel Virtualization Technology [Enabled]

Select Screen
Select Item
enter Select
+ - Change Opt.
F1 General Help
F2 Previous Values
F3 Optimized Defaults
F4 Save and Exit
ESC Exit

CPU FSB 100.00 MHz
Frequency 3511 MHz
Mem Size 16384 MB
Mem Freq 1600 MHz

CPU Volt 1.152 V
VDIMM Volt 1.512 V
VTT Volt 1.000 V
+12 Volt 12.140 V

CPU Temp 22 °C
NB Temp 45 °C
System Temp 28 °C

Hyper-threading

This item enables the Intel Hyper-Threading technology.

Options: Enabled, Disabled.

Active Processor Cores

Use this item to select the number of cores to enable in each processor package.

Options: All, 1, 2, 3.

Limit CPUID Maximum

We recommend leaving it disabled, unless you are using a very old OS or experiencing problems related to CPU identification/compatibility.

Options: Enabled, Disabled.

Execute Disable Bit

When this function is disabled, it forces the XD feature flag to always return to zero (0).

Options: Enabled, Disabled.

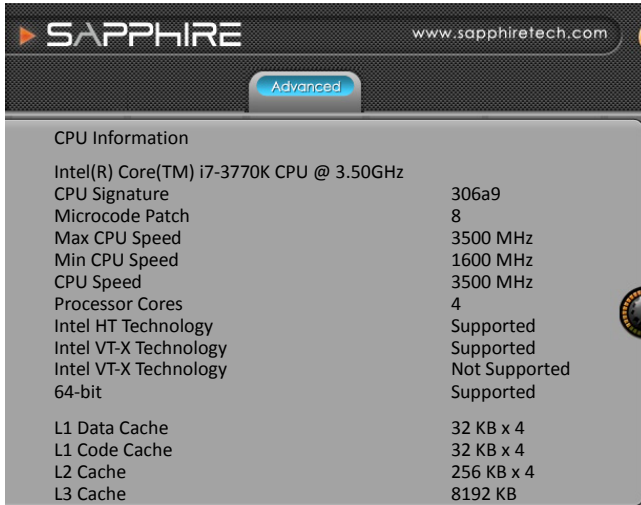
Intel Virtualization Technology

When this function is enabled, it allows a VMM to utilize the additional hardware capabilities provided by Intel Virtualization Technology.

Options: Enabled, Disabled.

▶ **CPU Information**

Displays the CPU related information.



▶ SATA Configuration

SAPPHIRE www.sapphiretech.com **QBIOS**

Advanced

SATA Controller(s)	[Enabled]
SATA Mode Selection	[AHCI]
Serial ATA Port 0	[Enabled]
Hot Plug	[Disable]
Serial ATA Port 1	[Enabled]
Hot Plug	[Disable]
Serial ATA Port 2	[Enabled]
Hot Plug	[Disable]
Serial ATA Port 3	[Enabled]
Hot Plug	[Disable]
Serial ATA Port 4	[Enabled]
Hot Plug	[Disable]
Serial ATA Port 5	[Enabled]
Hot Plug	[Disable]

Enable or disable SATA Device.

- Select Screen
- Select Item
- Select
- Change Opt.
- F1 General Help
- F2 Previous Values
- F3 Optimized Defaults
- F4 Save and Exit
- ESC Exit

CPU FSB 100.00 MHz
Frequency 3511 MHz
Mem Size 16384 MB
Mem Freq 1600 MHz

CPU Volt 1.152 V
VDimm Volt 1.512 V
VTT Volt 1.000 V
+12 Volt 12.140 V

CPU Temp 22 °C
NB Temp 45 °C
System Temp 28 °C

SATA Controller(s)

Enable or disable SATA Device.

SATA Mode Selection

Allows you to set the onboard Serial SATA type.

Options: IDE, AHCI, RAID.

- IDE Mode: Use the SATA hard disk drivers as Parallel ATA storage devices.
- RAID Mode: Create a RAID 0, 1, 0+1, 5 configuration
- AHCI Mode: Use the AHCI (Advanced Host Controller Interface) to enable advanced SATA features for improved performance with NCQ and Hot-plug features

Serial ATA Port 0 ~ Serial ATA Port 5

Allows you to enable the SATA port support.

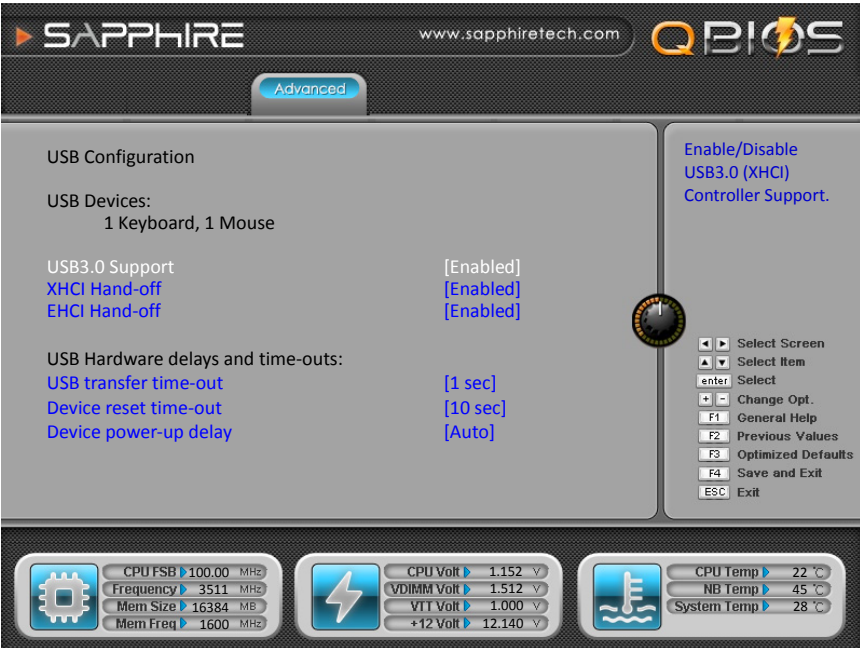
Options: Enabled, Disabled.

Hot Plug

Allows you to enable the SATA port hot plug support.

Options: Enabled, Disabled.

► USB Configuration



SAPPHIRE www.sapphiretech.com QBIOS

Advanced

USB Configuration

USB Devices:
1 Keyboard, 1 Mouse

USB3.0 Support [Enabled]
XHCI Hand-off [Enabled]
EHCI Hand-off [Enabled]

USB Hardware delays and time-outs:
USB transfer time-out [1 sec]
Device reset time-out [10 sec]
Device power-up delay [Auto]

Enable/Disable USB3.0 (XHCI) Controller Support.

Select Screen
Select Item
Select
Change Opt.
General Help
Previous Values
Optimized Defaults
Save and Exit
Exit

CPU FSB 100.00 MHz
Frequency 3511 MHz
Mem Size 16384 MB
Mem Freq 1600 MHz

CPU Volt 1.152 V
VDIMM Volt 1.512 V
VTT Volt 1.000 V
+12 Volt 12.140 V

CPU Temp 22 °C
NB Temp 45 °C
System Temp 28 °C

USB3.0 Support

Enables USB3.0 (XHCI) controller support.

Options: Enabled, Disabled.

XHCI Hand-off

This is a workaround for OSeS without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

Options: Enabled, Disabled.

EHCI Hand-off

This is a workaround for OSeS without EHCI hand-off support. The XHCI ownership change should be claimed by EHCI driver.

Options: Enabled, Disabled.

USB transfer time-out

The time-out value for control, bulk, and interrupt transfers.

Options: 1 sec, 5 sec, 10 sec, 20 sec.

Device reset time-out

Sets USB mass storage devices start unit command time-out.

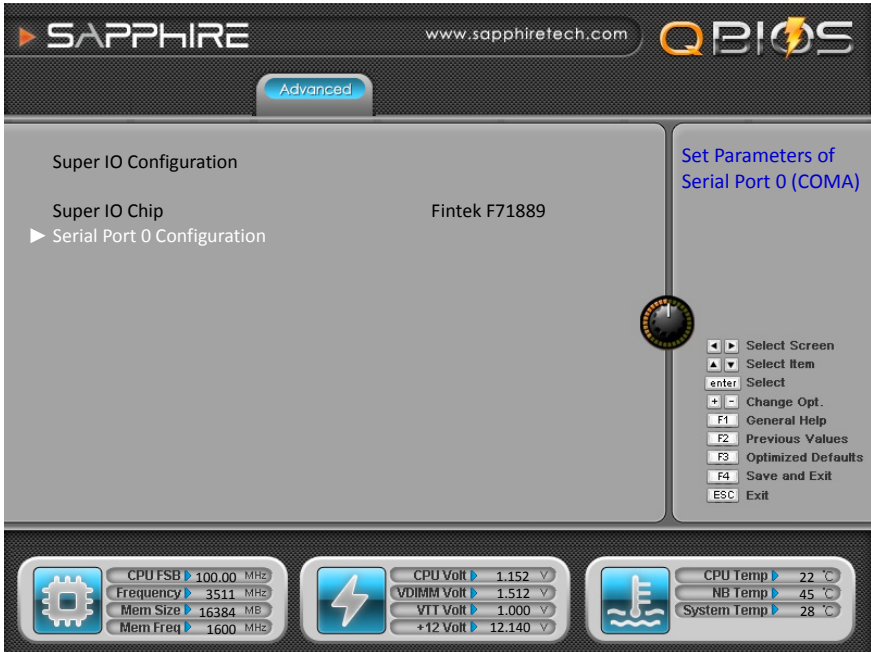
Options: 10 sec, 20 sec, 30 sec, 40 sec.

Device power-up delay

Maximum time the device will take before it properly reports itself to the Host controller. 'Auto' uses default values; for a Root port it is 100ms, for a Hub port the delay is taken from Hub descriptor.

Options: Auto, Manual.

► Super IO Configuration



► Serial Port 0 Configuration

Serial Port

Enables the Serial Port support.

Options: Enabled, Disabled.

Change Settings

Select an optimal setting for super I/O device.

Options: Auto, IO=3F8H; IRQ=4; IO=3F8h; IRQ=3,4,5,6,7,10,11,12;

IO=2F8h; IRQ=3,4,5,6,7,10,11,12; IO=3E8h; IRQ=3,4,5,6,7,10,11,12;

IO=2E8h; IRQ=3,4,5,6,7,10,11,12;

▶ H/W Monitor

SAPPHIRE www.sapphiretech.com **QBIOS**

Advanced

PC Health Status

▶ Smart Fan Configuration

CPU Temperature	: +22 C
VREG Temperature	: +45 C
System Temperature	: +29 C
CPU Fan Speed	: 1567 RPM
Power Fan Speed	: N/A
Chassis Fan Speed	: N/A
VCC3V	: +3.200 V
CPU VCore	: +1.152 V
CPU VTT	: +0.992 V
PCH	: +1.032 V
VDIMM	: +1.512 V
VCC	: +4.960 V
+12V	: +12.032 V
VSBB3V	: +3.328 V
VBAT	: +3.392 V

Navigation:
◀▶ Select Screen
▲▼ Select Item
enter Select
+ - Change Opt.
F1 General Help
F2 Previous Values
F3 Optimized Defaults
F4 Save and Exit
ESC Exit

Summary Boxes:
1. CPU FSB: 100.00 MHz, Frequency: 3511 MHz, Mem Size: 16384 MB, Mem Freq: 1600 MHz
2. CPU Volt: 1.152 V, VDIMM Volt: 1.512 V, VTT Volt: 1.000 V, +12 Volt: 12.140 V
3. CPU Temp: 22 °C, NB Temp: 45 °C, System Temp: 28 °C

CPU/ VREG/ System

Displays the current CPU, onboard regulator and system temperature.

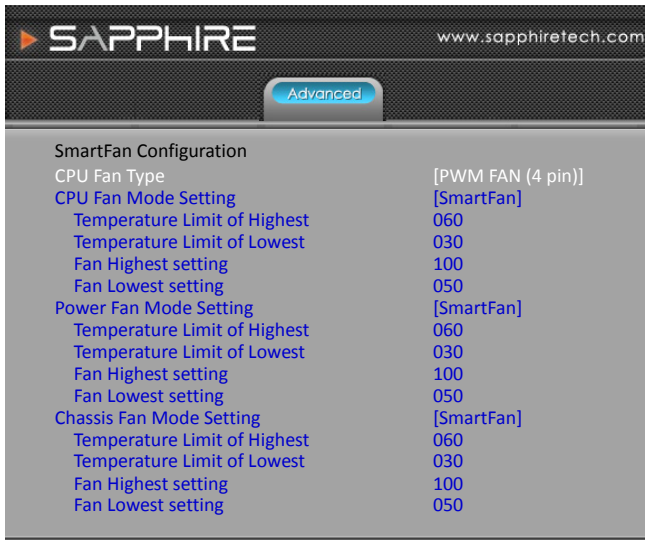
CPU/ Power/ Chassis Fan Speed

Displays the current CPU, Power and Chassis Fan Speed

VCC3V/ CPU VCore/ CPU VTT/ PCH/ VDIMM/VCC/+12V/ VSB3V/ VBAT

The current voltages are automatically detected and displayed by the system.

► Smart Fan Configuration



CPU Fan Type

Allows you to select the CPU Fan type.

Options: PWM FAN (4 pin), Linear FAN (3 pin)

CPU Fan Mode Setting

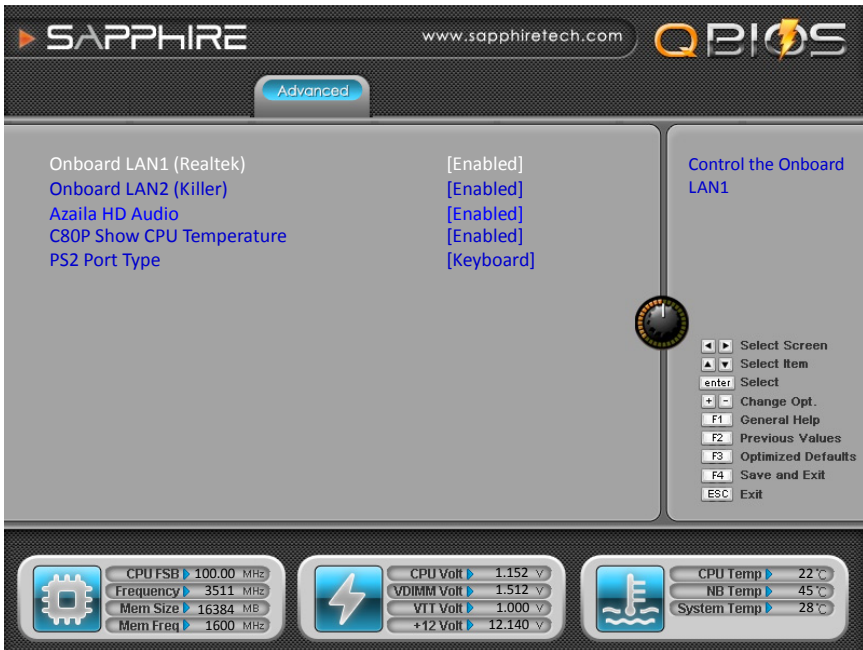
This item controls the speed of the various fans on the motherboard.

Choose [SmartFan] when you want the speed of the fans automatically controlled based on temperature. To set the fan speed to a constant rate, select [Manual Mode] and then enter the speed from 0% to 100%.

Set the desired speed for the Power and Chassis fans from 0% to 100%.

The system defaults to 100%.

► Onboard Device Configuration



Onboard LAN1 (Realtek)

Enables the onboard Giga Lan 1 function by Realtek for LAN.

Options: Enabled, Disabled

Onboard LAN2 (Killer) (Optional)

Enables the onboard Giga Lan 2 function by Killer for LAN.

Options: Enabled, Disabled

Azalia HD Device

Enables the onboard High Definition Audio controller.

Options: Enabled, Disabled.

C80P Show CPU Temperature

Enables the onboard POST Port LED to display CPU temperature.

Options: Enabled, Disabled.

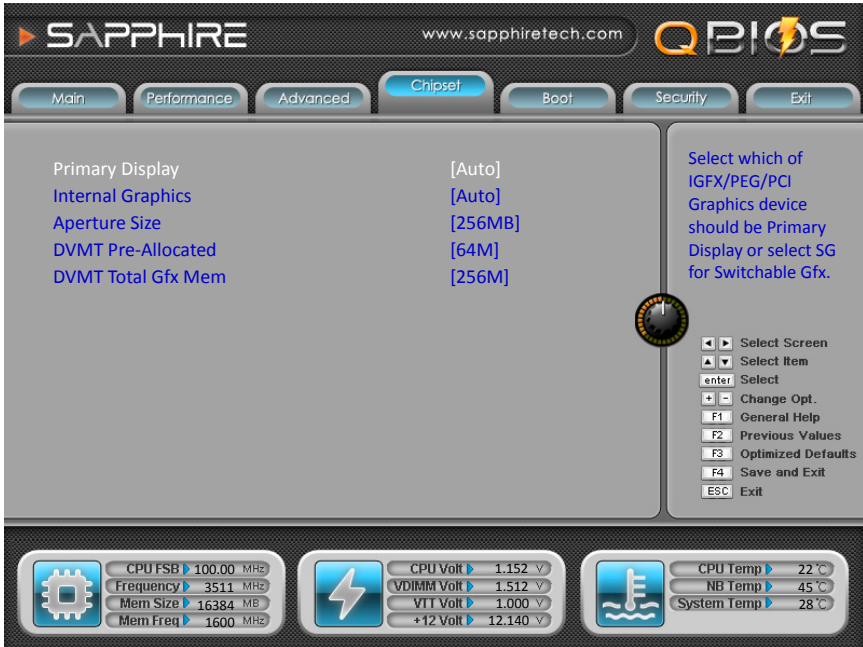
PS2 Port Type

The item allows you to select the type of PS2 port.

Options: Keyboard, Mouse.

3-6 Chipset Menu

The chipset menu items allow you to change the advanced chipset settings. Press <Enter> to display the sub-menu.



Primary Display

Select which graphics controller to use as the primary boot device

Options: Auto, IGFX, PEG, PCI.

Initiate Graphic Adapter

Keep IGD enabled based on the setup options.

Options: Auto, Enabled, Disabled.

Aperture Size

It is a video configuration option that determines the amount of system memory available for direct access by the graphics device.

Options: 128MB, 256MB, 512MB.

DVMT Pre-Allocated

Select DVMT 5.0 Pre-Allocated(fixed) graphics memory size used by the internal graphics device.

Options: 32MB, 64MB, 96MB, 128MB, 160MB, 192MB, 224MB, 256MB, 288MB,

320MB, 352MB, 384MB, 416MB, 448MB, 480MB, 512MB, 1024MB.

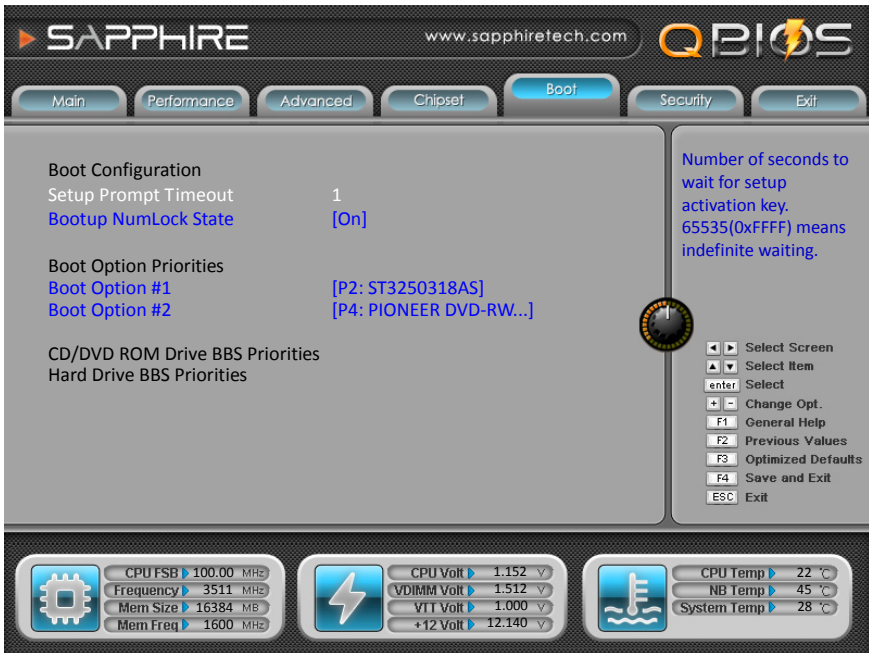
DVMT Total Gfx Mem

Select DVMT 5.0 total graphics memory size used by the internal graphics device.

Options: 128MB, 256MB, MAX.

3-7 Boot Menu

The Boot menu is used to configure the boot settings and the boot priority.



Setup Prompt Timeout

This is used to set an additional time the POST should wait for the operator to press the key to enter setup. The time is entered in seconds.

Bootup NumLock State

Selects the state of the keyboard's numlock function after POST.

Options: On, Off.

Boot Option Priorities

These options are used to form the boot order and are dynamically generated.

CD/DVD ROM Drive BBS Priorities

Allows configure the boot order for a specific CD/DVD ROM device class.

Hard Drive BBS Priorities

Allows configure the boot order for a specific Hard Drive device class.

3-8 Security Menu

The Security menu allows you to change the system security settings.



Administrator Password

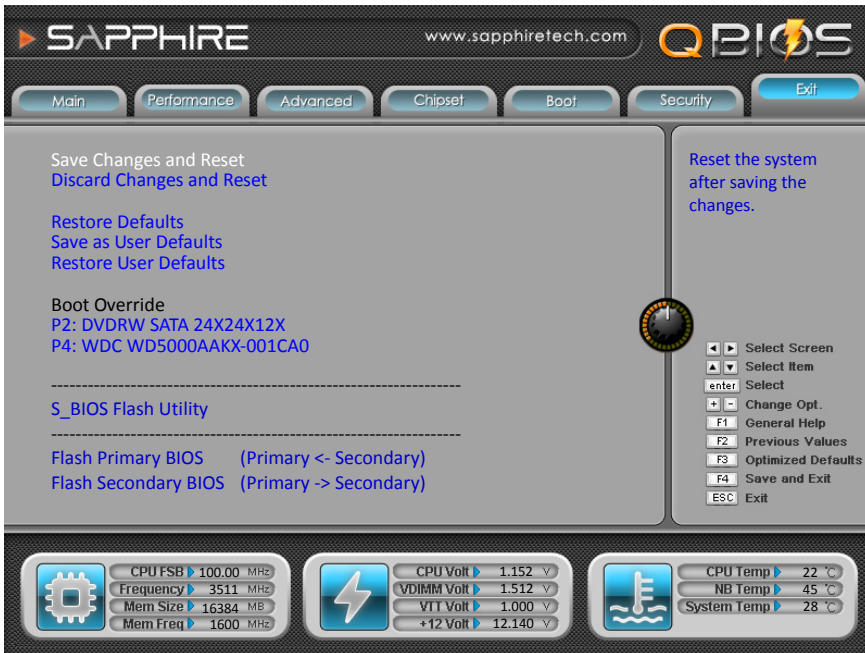
This function is used to set, change or delete the Administrator password. If there is already a password installed, the system asks for this first. To clear a password, simply enter nothing and acknowledge by pressing Return. To set a password, enter it twice and acknowledge by pressing Return. The password must be 3 to 20 characters long.

User Password

This function is used to set, change or delete the User password. If there is already a password installed, the system asks for this first. To clear a password, simply enter nothing and acknowledge by pressing Return. To set a password, enter it twice and acknowledge by pressing Return. The password must be 3 to 20 characters long.

3-9 Save & Exit Menu

The Save & Exit menu allows you to load the optimal default values for BIOS, and save or discard your changes to the BIOS items.



Save Changes and Reset

This resets system after saving the changes.

Discard Changes and Reset

This resets system without saving the changes.

Restore Defaults

The restore defaults are the factory settings of this motherboard.

Save as User Defaults

This is used to save all current settings as user default. The current setup state can later be restored using Restore User Defaults.

Restore User Defaults

This is used to restore all tokens to settings previously stored by Save as User Defaults.

Boot Override

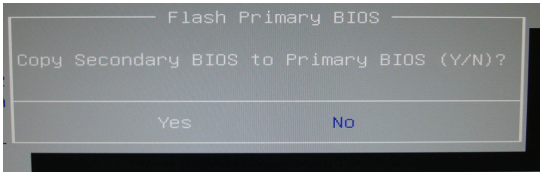
This group of functions includes a list, each of them corresponding to one device within the boot order. Select a drive to immediately boot that device regardless of the current boot order.

S_BIOS Flash Utility

This utility allows you to update the system BIOS in embedded BIOS. Please refer to "4-4 S_BIOS Flash Utility" for details.

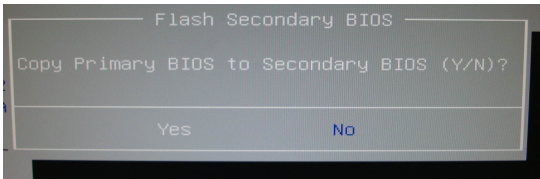
Flash Primary BIOS (Primary <- Secondary)

This item allows you to copy the Secondary BIOS to Primary BIOS.



Flash Secondary BIOS (Primary -> Secondary)

This item allows you to copy the Primary BIOS to Secondary BIOS.



Chapter 4 Driver Installation

After the operating system has been installed, you need to install drivers for this mainboard.

The support DVD that came with the motherboard contains necessary drivers and useful utilities that enhance the motherboard features.

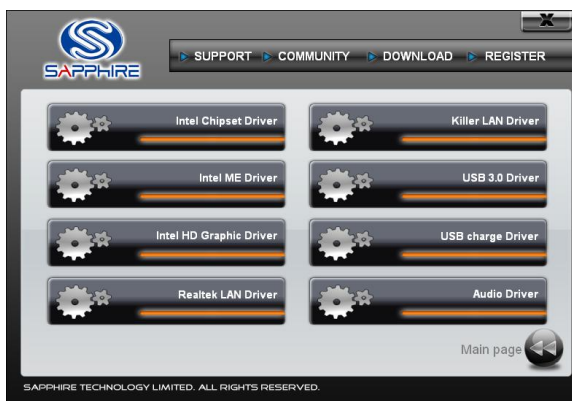
4-1 Driver Install

Insert the bundled driver DVD into your optical drive and the main menu will be displayed on your PC screen. Click each item button and select the item you want to install.




<Main Page>

The Mainboard Drivers item shows the available device drivers. Install the necessary drivers to use the devices.



<Mainboard Drivers page>

 **Note:** If Autorun function is not enabled in your computer, browse the contents of the support DVD to locate the file autorun.exe, and click this file to run the CD.

4-2 TRIXX Utility

TRIXX is a simple and easy-to-use utility that allows users to adjust system settings for overclocking in a Windows environment. The TRIXX utility includes three configurations for frequency, voltage and hardware monitoring.

To install TRIXX Utility, run it from the Sapphire Utility page from the bundled DVD. A TRIXX Utility shortcut will be created on the Desktop.

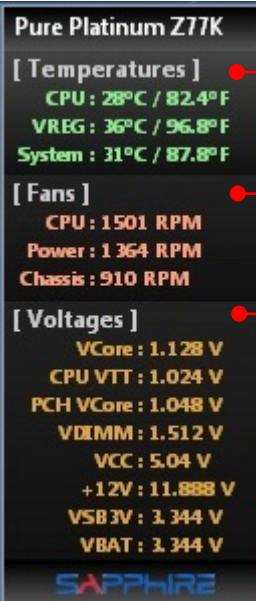
The screenshot shows the TRIXX Utility interface with the following sections and annotations:

- System Information:** Displays current CPU information: Pure Platinum 277K, Intel(R) Core(TM) i7-3770K CPU @ 3.50GHz, Intel® 6 Family 6 Model 58 Stepping 9, 100.0 x 39.0 = 3900.0 MHz.
- Frequency:** Adjust frequency for CPU. CPU: 100.0 MHz, PCIe: 100 MHz.
- Voltages:** Adjust voltage for CPU, DIMM etc. VCore: Auto, PCH VCore: 1.050V, CPU VSA/VTT: +0.000V, CPU PLL: 1.800V, and various Voltage9-12 settings.
- Ratio:** Adjust ratio for CPU, DIMM etc. CPU, Ratio2, Ratio3, Ratio4.
- Monitoring:** Displays system hardware monitor status. CPU Fan: 1498 RPM, Power Fan: 1362 RPM, Chassis Fan: 910 RPM, Fan4: 0 RPM, CPU Temperature: 28°C / 82°F, VREG Temperature: 37°C / 98°F, System Temperature: 31°C / 87°F, Temperature4: 0°C / 32°F, VCore: 1.128V, VCC: 5.080V, CPU VTT: 1.024V, +12V: 11.888V, PCH VCore: 1.048V, VSB3V: 3.344V, VDIMM: 1.512V, VBAT: 3.344V.
- Apply:** Apply the chosen settings.

* Actual adjustment options will be different with the picture

4-3 Hardware monitor gadget

This Hardware monitor gadget directly appears in windows screen after TriXX installation is completed. It can be used to help keep track of temperatures of CPU, System and fan speed of CPU, System and voltages of CPU, System.



The screenshot displays the hardware monitor gadget for a Pure Platinum Z77K motherboard. It is divided into three sections: Temperatures, Fans, and Voltages. Each section has a red dot with an arrow pointing to a descriptive text label.

Category	Item	Value
[Temperatures]	CPU	28°C / 82.4°F
	VREG	36°C / 96.8°F
	System	31°C / 87.8°F
[Fans]	CPU	1501 RPM
	Power	1364 RPM
	Chassis	910 RPM
[Voltages]	VCore	1.128 V
	CPU VTT	1.024 V
	PCH VCore	1.048 V
	VDIMM	1.512 V
	VCC	5.04 V
	+12V	11.888 V
	VSB3V	1.344 V
	VBAT	1.344 V

SAPPHIRE

Displays hardware monitor temperature.

Displays fan speeds.

Displays voltages of system.

4-4 S_BIOS Flash Utility

This mainboard provides a BIOS update tool. The S_BIOS allows you to update the system BIOS without having to enter MS-DOS or Windows environment. Embedded in the BIOS, the S_BIOS is simple and easy-to-use utility to flash BIOS.

Refer to the following steps for S_BIOS Flash.

Setp1:

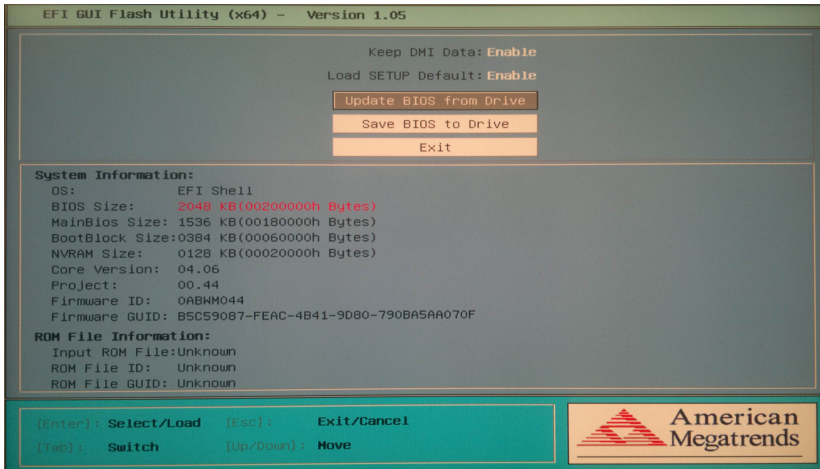
Enter BIOS setup screen, select "S_BIOS Flash Utility" item from "Exit" tab.



Setp2:

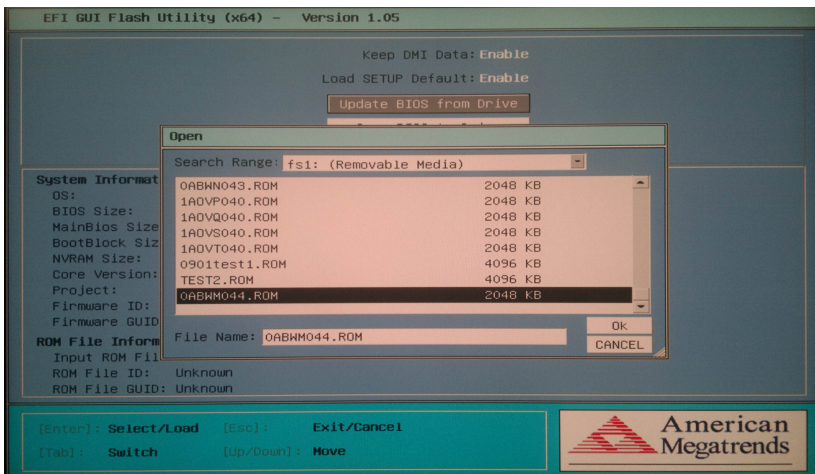
The S-BIOS flash utility allows you to:

- Update BIOS form Drive (please refer to setp3)
- Save BIOS to Drive (please refer to setp6)



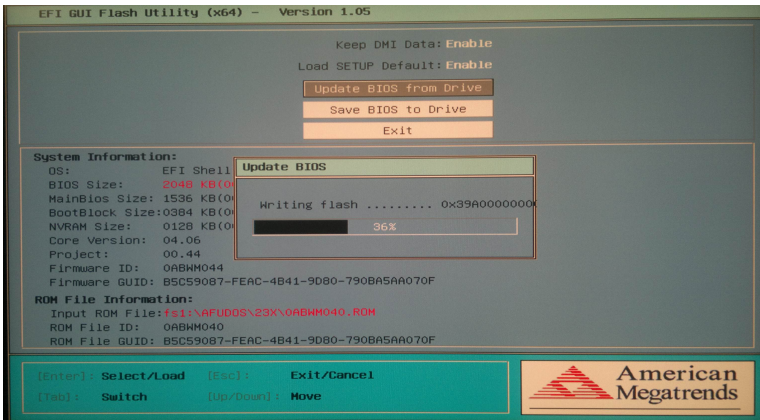
Step3:

To Update BIOS from Drive, select the BIOS update file and press <OK> to start update. If the BIOS file stored in USB device, please must first insert USB device before turning on the system and **make sure the BIOS update file matches your mainboard model.**



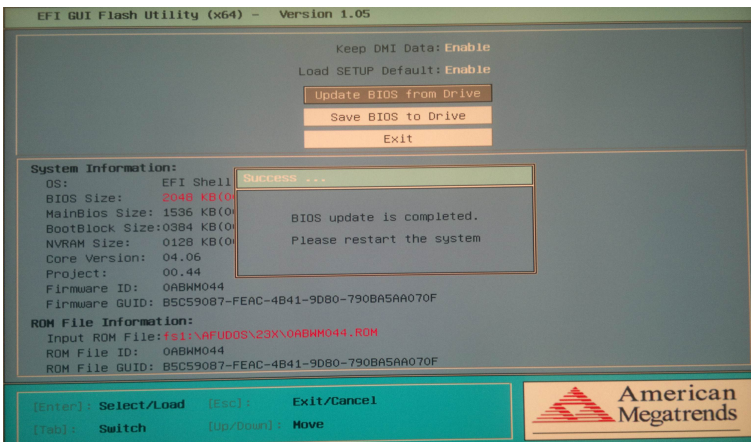
Setp4:

The update BIOS processing screen appears.



Setp5:

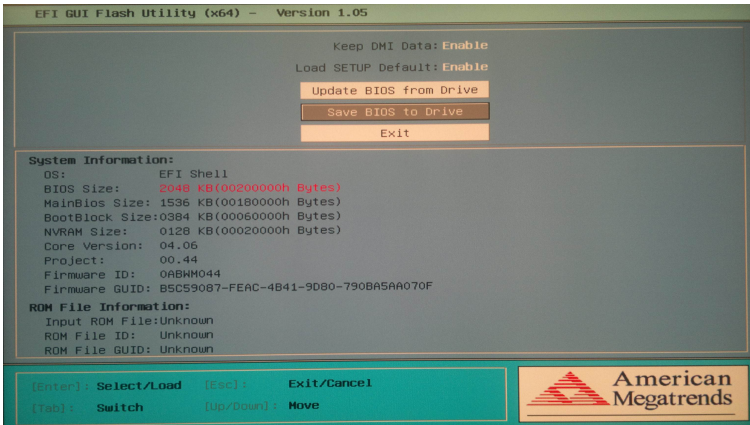
The BIOS update is completed. Please press any key to restart the system.



Setp6:

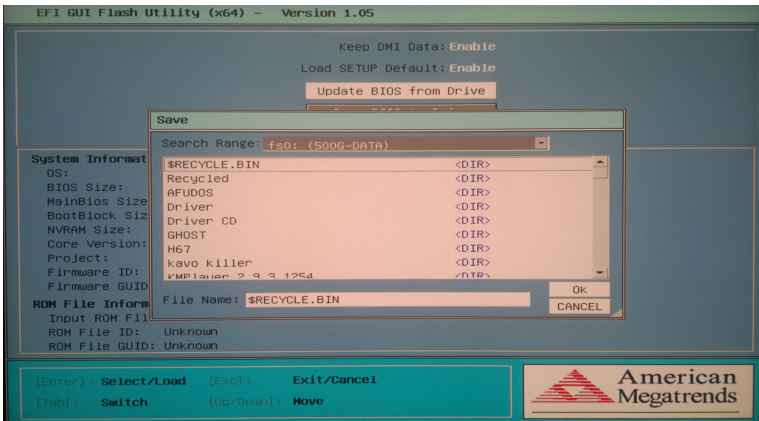
Save BIOS to Drive, allows you to save the current BIOS file.

If the BIOS file stored in USB device, please must first insert USB device before turning on the system.



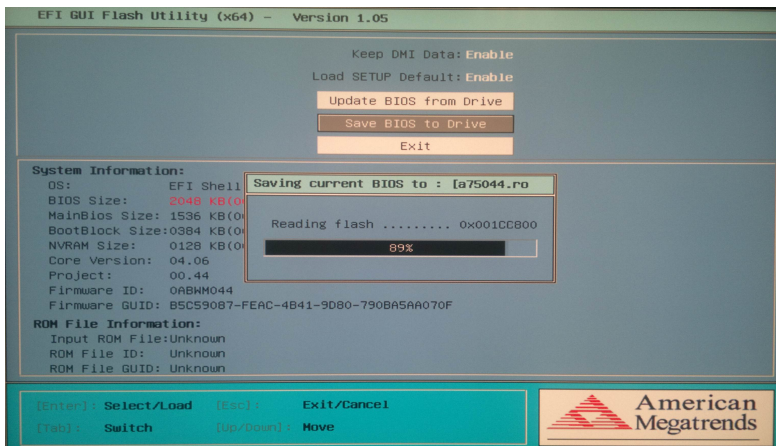
Setp7:

To Save BIOS to Drive, Select the stored location and press <OK> to start saving BIOS file.



Setup8:

After saving BIOS file is completed. Select <Ese> to return "Exit" tab of BIOS setup.



Chapter 5 POST Code

This chapter provides the Aptio POST Codes List for the mainboard during the BIOS pre-boot process.

The POST Codes are displayed on the Debug LED readout located directly onboard the mainboard.

Please refer to following “boot phases”, which may apply to various status code & checkpoint descriptions:

- ◆ Security (SEC) – initial low-level initialization
- ◆ Pre-EFI Initialization (PEI) – memory initialization
- ◆ Driver Execution Environment (DXE) – main hardware initialization
- ◆ Boot Device Selection (BDS) – system setup, pre-OS user interface & selecting a bootable device (CD/DVD, HDD, USB, Network, Shell,...)

Checkpoint Ranges

Status Code Range	Description
01 – 0B	SEC execution
0C – 0F	SEC errors
10 – 2F	PEI execution up to and including memory detection
30 – 4F	PEI execution after memory detection
50 – 5F	PEI errors
60 – 8F	DXE execution up to BDS
90 – CF	BDS execution
D0 – DF	DXE errors
E0 – E8	S3 Resume (PEI)
E9 – EF	S3 Resume errors (PEI)
F0 – F8	Recovery (PEI)
F9 – FF	Recovery errors (PEI)

Standard Checkpoints

◆ SEC Phase

Status Code	Description
00	Not used
Progress Codes	
01	Power on. Reset type detection (soft/hard).
02	AP initialization before microcode loading
03	North Bridge initialization before microcode loading
04	South Bridge initialization before microcode loading

05	OEM initialization before microcode loading
06	Microcode loading
07	AP initialization after microcode loading
08	North Bridge initialization after microcode loading
09	South Bridge initialization after microcode loading
0A	OEM initialization after microcode loading
0B	Cache initialization
SEC Error Codes	
0C – 0D	Reserved for future AMI SEC error codes
0E	Microcode not found
0F	Microcode not loaded

◆ PEI Phase

Status Code	Description
Progress Codes	
10	PEI Core is started
11	Pre-memory CPU initialization is started
12– 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
PEI Error Codes	
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
S3 Resume Progress Codes	
E0	S3 Resume is started (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
S3 Resume Error Codes	
E8	S3 Resume Failed
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
Recovery 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
Recovery Error 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

◆ DXE Phase

Status Code	Description
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
DXE Error 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 (Load Image returned error)
DA	Boot Option is failed (Start Image returned error)
DB	Flash update is failed
DC	Reset protocol is not available