

BIOS User Guide

H110MDE

BIOS Update	2
UEFI BIOS Setup	6
1. Main Menu	7
2. Advanced Menu	8
3. Chipset Menu	17
4. Boot Menu	21
5. Security Menu	24
6. O.N.E Menu	27
7. Exit Menu	34



BIOS Update

The BIOS can be updated using either of the following utilities:

- **BIOSTAR BIOS Flasher:** Using this utility, the BIOS can be updated from a file on a hard disk, a USB drive (a flash drive or a USB hard drive), or a CD-ROM.
- **BIOSTAR BIOS Update Utility:** It enables automated updating while in the Windows environment. Using this utility, the BIOS can be updated from a file on a hard disk, a USB drive (a flash drive or a USB hard drive), or a CD-ROM, or from the file location on the Web.

BIOSTAR BIOS Flasher

► Note

- » This utility only allows storage device with FAT32/16 format and single partition.
- » Shutting down or resetting the system while updating the BIOS will lead to system boot failure.

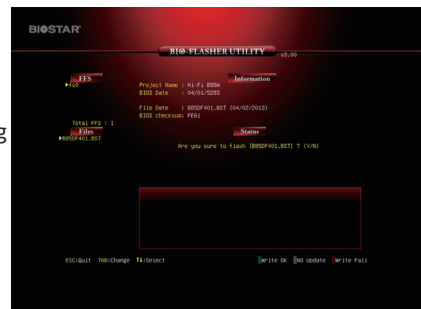
Updating BIOS with BIOSTAR BIOS Flasher

1. Go to the website to download the latest BIOS file for the motherboard.
2. Then, copy and save the BIOS file into a USB flash (pen) drive.(Only supported FAT/FAT32 format)
3. Insert the USB pen drive that contains the BIOS file to the USB port.
4. Power on or reset the computer and then press <F12> during the POST process.

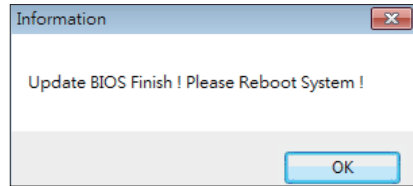
5. After entering the POST screen, the BIOS-FLASHER utility pops out. Choose <fs0> to search for the BIOS file.



6. Select the proper BIOS file, and a message asking if you are sure to flash the BIOS file. Click “Yes” to start updating BIOS.



7. After the updating process is finished, you will be asked you to reboot the system. Click “OK” to reboot.



8. While the system boots up and the full screen logo shows up, press key to enter BIOS setup.

After entering the BIOS setup, please go to the <Save & Exit>, using the <Restore Defaults> function to load Optimized Defaults, and select <Save Changes> and <Reset> to restart the computer. Then, the BIOS Update is completed.

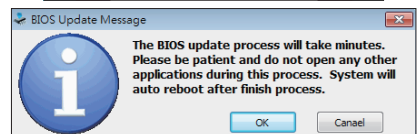
BIOS Update Utility (through a BIOS file)

1. Installing BIOS Update Utility from the DVD Driver.
2. Download the proper BIOS from <http://www.biostar.com.tw/>

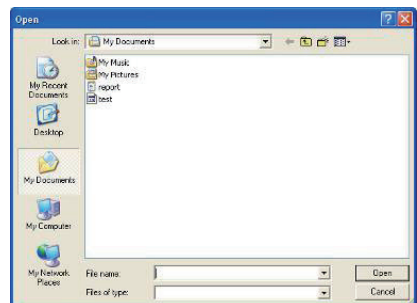
3. Launch BIOS Update Utility and click the “Update BIOS” button on the main screen.



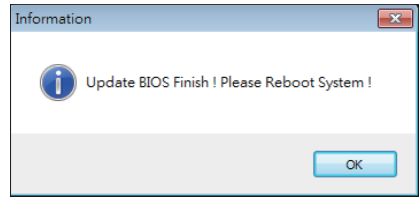
4. A warning message will show up to request your agreement to start the BIOS update. Click “OK” to start the update procedure.



5. Choose the location for your BIOS file in the system. Please select the proper BIOS file, and then click on “Open”. It will take several minutes, please be patient.



6. After the BIOS Update process is finished, click on “OK” to reboot the system.

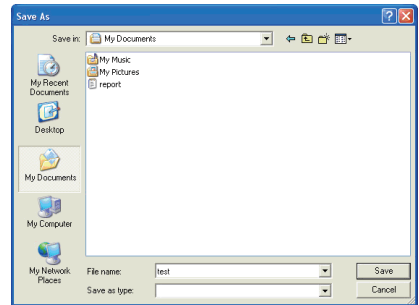


7. While the system boots up and the full screen logo shows up, press key to enter BIOS setup.

After entering the BIOS setup, please go to the <Save & Exit>, using the <Restore Defaults> function to load Optimized Defaults, and select <Save Changes and Reset> to restart the computer. Then, the BIOS Update is completed.

Backup BIOS

Click the Backup BIOS button on the main screen for the backup of BIOS, and select a proper location for your backup BIOS file in the system, and click “Save”.



UEFI BIOS Setup

Introduction

The purpose of this manual is to describe the settings in the AMI UEFI BIOS Setup program on this motherboard. The Setup program allows users to modify the basic system configuration and save these settings to NVRAM.

UEFI BIOS determines what a computer can do without accessing programs from a disk. This system controls most of the input and output devices such as keyboard, mouse, serial ports and disk drives. BIOS activates at the first stage of the booting process, loading and executing the operating system. Some additional features, such as virus and password protection or chipset fine-tuning options are also included in UEFI BIOS.

The rest of this manual will to guide you through the options and settings in UEFI BIOS Setup.

Plug and Play Support

This AMI UEFI BIOS supports the Plug and Play Version 1.0A specification.

EPA Green PC Support

This AMI UEFI BIOS supports Version 1.03 of the EPA Green PC specification.

ACPI Support

AMI ACPI UEFI BIOS support Version 1.0/2.0 of Advanced Configuration and Power interface specification (ACPI). It provides ASL code for power management and device configuration capabilities as defined in the ACPI specification, developed by Microsoft, Intel and Toshiba.

PCI Bus Support

This AMI UEFI BIOS also supports Version 2.3 of the Intel PCI (Peripheral Component Interconnect) local bus specification.

Using Setup

When starting up the computer, press during the **Power-On Self-Test (POST)** to enter the UEFI BIOS setup utility.

In the UEFI BIOS setup utility, you will see **General Help** description at the top right corner, and this is providing a brief description of the selected item. **Navigation Keys** for that particular menu are at the bottom right corner, and you can use these keys to select item and change the settings.

Note

- » *The default UEFI BIOS settings apply for most conditions to ensure optimum performance of the motherboard. If the system becomes unstable after changing any settings, please load the default settings to ensure system's compatibility and stability. Use Load Setup Default under the Exit Menu.*
- » *For better system performance, the UEFI BIOS firmware is being continuously updated. The UEFI BIOS information described in this manual is for your reference only. The actual UEFI BIOS information and settings on board may be slightly different from this manual.*
- » *The content of this manual is subject to be changed without notice. We will not be responsible for any mistakes found in this user's manual and any system damage that may be caused by wrong-settings.*

1. Main Menu

Once you enter AMI UEFI BIOS Setup Utility, the Main Menu will appear on the screen providing an overview of the basic system information.



BIOS Information

It shows system information including UEFI BIOS version, Project Code, Model Name, Build Date and etc.

Total Memory

Shows system memory size, VGA shard memory will be excluded.

Memory Frequency

Shows the system memory frequency.

System Language

Choose the system default language.

System Date

Set the system date. Note that the 'Day' automatically changes when you set the date.

System Time

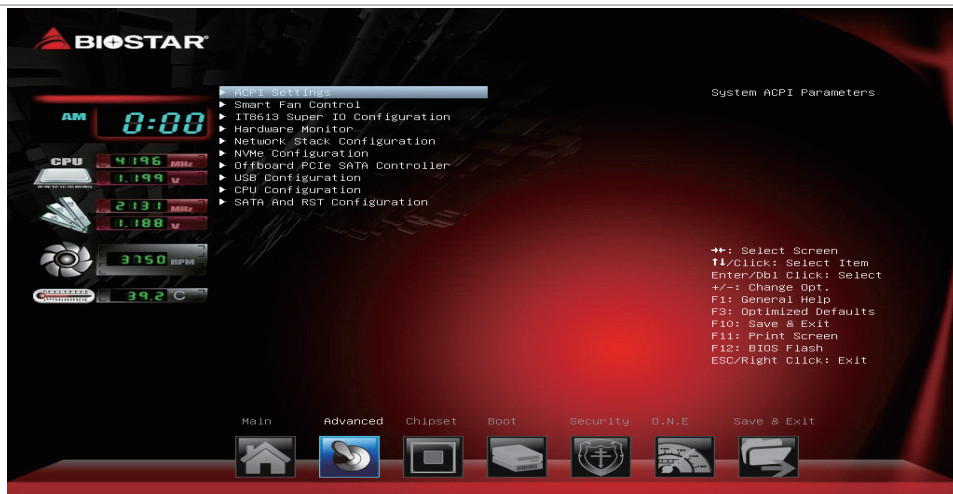
Set the system internal clock.

2. Advanced Menu

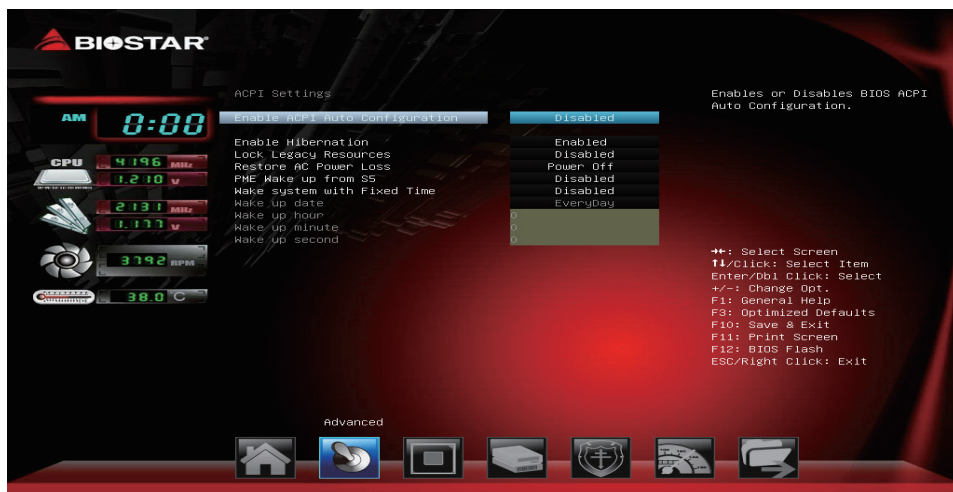
The Advanced Menu allows you to configure the settings of CPU, Super I/O, Power Management, and other system devices.

Note

» Beware of that setting inappropriate values in items of this menu may cause system to malfunction.



ACPI Settings



Enable ACPI Auto Configuration

This item enables or disables BIOS ACPI auto configuration function.

Options: Disabled (Default) / Enabled

Enable Hibernation

This item enables or disables system ability to hibernate (OS/S4 sleep state). This option may not be effective with some OSs.

Options: Enabled (Default) / Disabled

Lock Legacy Resources

The item enables or disables Lock of Legacy Resources.

Options: Disabled (Default) / Enabled

Restore AC Power Loss

Specify what state to go to when power is re-applied after a power failure.

Options: Power Off (Default) / Power On / Last State

PME Wake up from S5

The item enables the system to wake from S5 using PME event.

Options: Disabled (Default) / Enabled

Wake system with Fixed Time

This item enables or disables the system to wake on by alarm event. When this item is enabled, the system will wake on the hr::min::sec specified.

Options: Disabled (Default) / Enabled

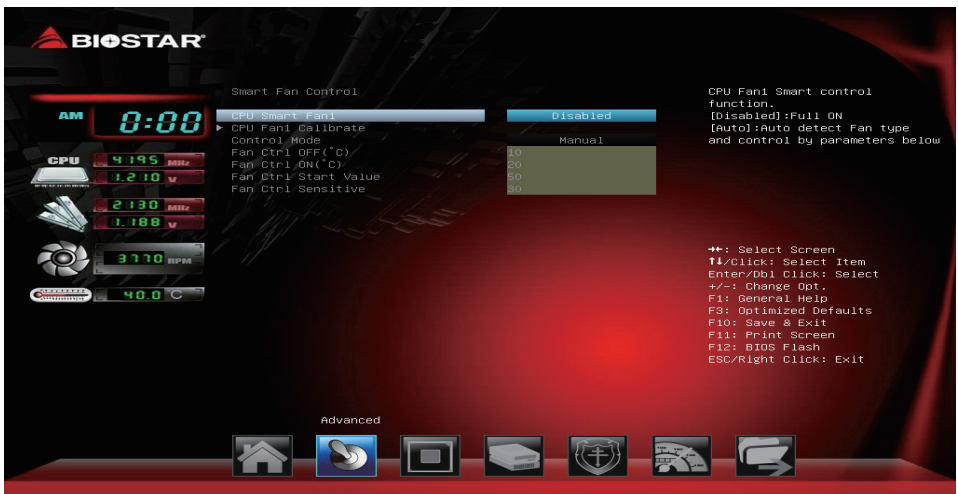
Wake up date

You can choose which date the system will boot up.

Wake up hour / Wake up minute / Wake up second

You can choose the system boot up time, input hour, minute and second to specify.

SMART FAN Control



CPU Smart Fan1

This item allows you to control the CPU Smart Fan function.

Options: Disabled (Default) / Auto

Note

» The following items appear only when you set the Smart Fan function to [Auto].

CPU Fan Calibrate

Press [ENTER] to calibrate CPU Fan speed.

Control Mode

This item provides several operation modes of the fan.

Options: Manual / Quiet / Aggressive

Fan Ctrl OFF(°C)

When CPU temperature is lower than this value, the CPU fan will keep lowest RPM.

Options: 10 (°C) (default)

Fan Ctrl On(°C)

When CPU temperature is higher than this value, the CPU fan controller will turn on.

Options: 20 (°C) (Default)

Fan Ctrl Start Value

This item sets CPU FAN Start Speed Value.

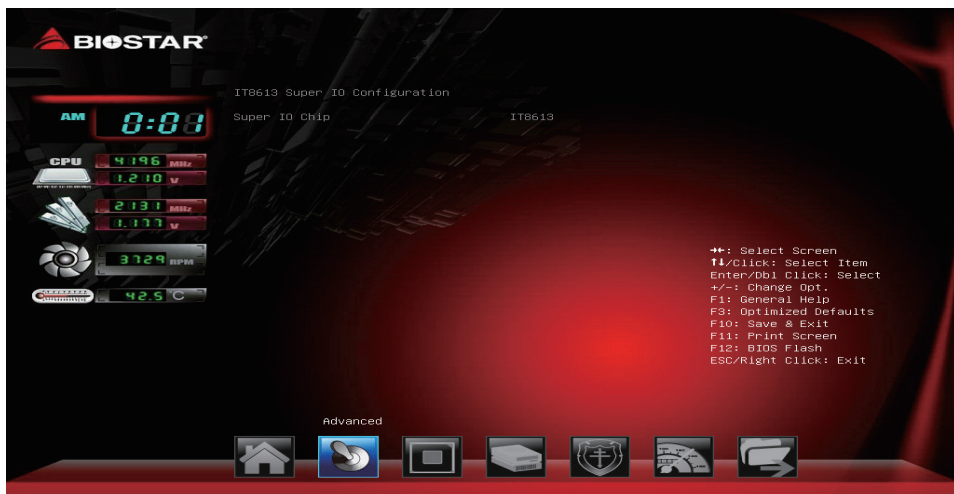
Options: 50 (Default)

Fan Ctrl Sensitive

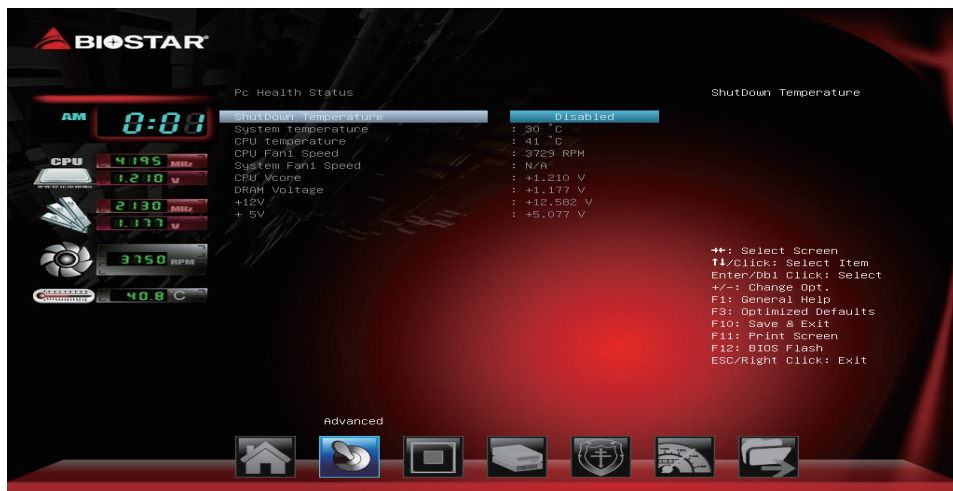
The bigger the numeral is, the higher the FAN speed is.

Options: 30 (Default)

Super IO Configuration



H/W Monitor



Shutdown Temperature

This item allows you to set up the CPU shutdown Temperature.

Options: Disabled (Default) / 70°C/158°F / 75°C/167°F / 80°C/176°F / 85°C/185°F / 90°C/194°F

Network Stack Configuration



Network Stack

This item enables or disables UEFI network stack

Options: Disabled (Default) / Enabled

Note

» The following items appear only when you set the Network Stack function to [Enabled]

IPv4 PXE Support

This item enables or disables IPv4 PXE Boot Support. If disabled IPv4 PXE boot option will not be created.

Options: Disabled (Default) / Enabled

IPv4 HTTP Support

This item enables or disables IPv4 HTTP Boot Support. If disabled IPv4 HTTP boot option will not be created.

Options: Disabled (Default) / Enabled

IPv6 PXE Support

This item enables or disables IPv6 PXE Boot Support. If disabled IPv6 PXE boot option will not be created.

Options: Disabled (Default) / Enabled

IPv6 HTTP Support

This item enables or disables IPv6 HTTP Boot Support. If disabled IPv6 HTTP boot option will not be created.

Options: Disabled (Default) / Enabled

PXE boot wait time

Wait time to press ESC key to abort the PXE boot.

Media detect time

Wait time in sec to detect media.

NVMe Configuration

The item shows NVMe controller and driver information.



Offboard PCIe SATA Controller



USB Configuration



Legacy USB Support

The item allows you to enable Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.

Options: Enabled (Default) / Disabled / Auto

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: Disabled (Default) / Enabled

USB Mass Storage Driver Support

The item allows you to enable or disable USB Mass Storage Driver Support.

Options: Enabled (Default) / Disabled

Port 60/64 Emulation

The item allows you to enable or disable I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.

Options: Enabled (Default) / Disabled

USB transfer time-out

The time-out value for Control, Bulk, and Interrupt transfers.

Options: 20 sec (Default) / 1 sec / 5 sec / 10 sec

Device reset time-out

The item sets USB mass storage device Start Unit command time-out.

Options: 20 sec (Default) / 10 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 value: for a Root port it is 100ms, for a Hub port the delay is taken from Hub descriptor.

Options: Auto (Default) / Manual

Note

» The following items appear only when you set the Device power-up delay function to [Manual].

Device power-up delay in seconds

Delay range is 1 ~ 40 seconds, in one second increments.

Options: 5 (Default)

USB FLASH DRIVE PMAP

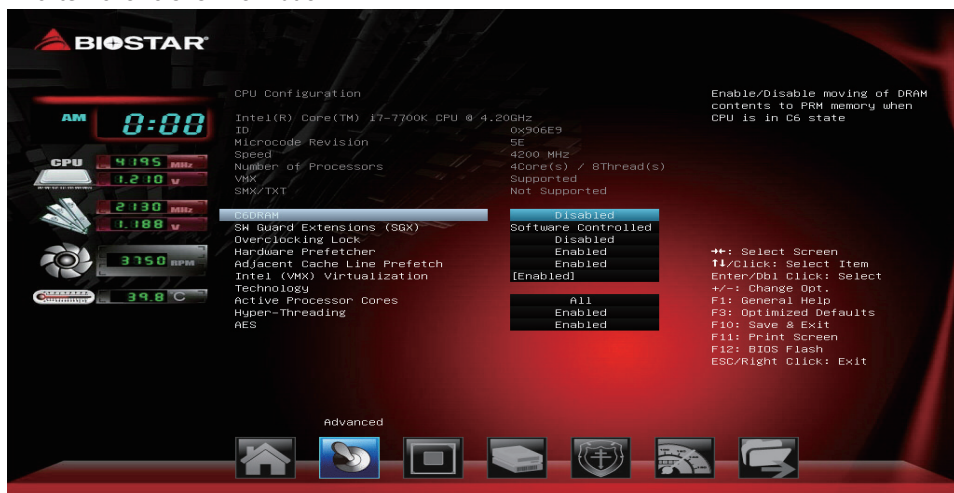
Mass storage device emulation type. ‘AUTO’ enumerates devices according to their media format.

Optical drives are emulated as ‘CDROM’, drives with no media will be emulated according to a drive type.

Options: Auto (Default) / Floppy / Forced FDD / Hard Disk / CD-ROM

CPU Configuration

This item shows CPU Information



C6DRAM

This item enables or disables moving of DRAM contents to PRM memory when CPU is in C6 state.

Options: Disabled (Default) / Enabled

SW Guard Extensions (SGX)

This item enables or disables Software Guard Extensions (SGX).

Options: Software Controlled (Default) / Enabled / Disabled

Note

» The following items appear only when you set the SW Guard Extensions function to [Enabled].

PRMRR Size

This item allows you to setting the PRMRR Size.

Options: 128MB (Default) / INVALID PRMRR / 32MB 64MB

Overclocking Lock

This item enables or disables Overclocking Lock.

Options: Disabled (Default) / Enabled

Hardware Prefetcher

This item to turn on/off the MLC streamer prefetcher.

Options: Enabled (Default) / Disabled

Adjacent Cache Line Prefetch

This item to turn on/off prefetching of adjacent cache lines.

Options: Enabled (Default) / Disabled

Intel (VMX) Virtualization Technology

This item enables or disables Intel Virtualization Technology. When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Options: Enabled (Default) / Disabled

Active Processor Cores

This item sets number of cores to enable in each processor package.

Options: All (Default) / 1 / 2 / 3

Hyper-Threading

This item enables for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and disables for other OS(OS not optimized for Hyper-Threading Technology).

Options: Enabled (Default) / Disabled

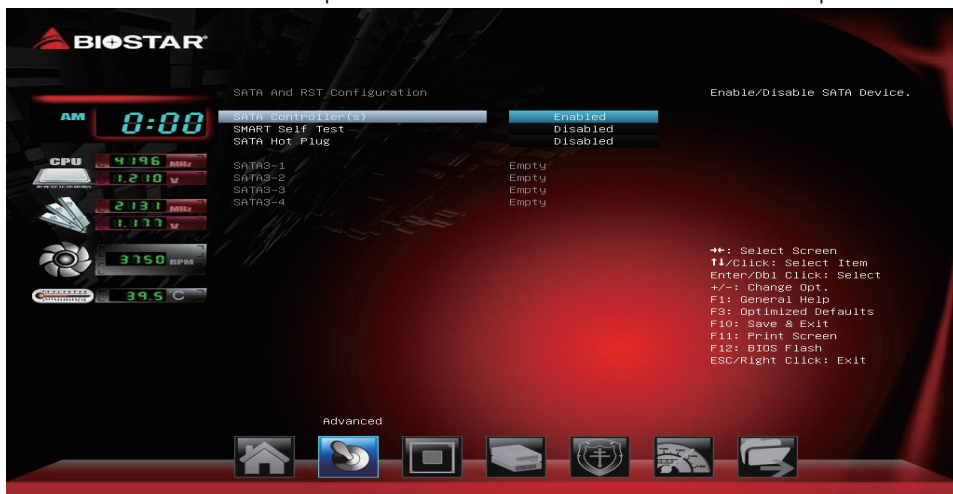
AES

This item sets CPU Advanced Encryption Standard instructions.

Options: Enabled (Default) / Disabled

SATA and RST Configuration

The BIOS will automatically detect the presence of SATA devices. There is a sub-menu for each SATA device. Select a device and press <Enter> to enter the sub-menu for detailed options.



SATA Controller(s)

This item enables or disables Serial ATA Device.

Options: Enabled (Default) / Disabled

SMART Self Test

This item runs SMART Self Test on all HDDs during POST.

Options: Disabled (Default) / Enabled

SATA Hot Plug

This item enables or disables designates SATA port as Hot Pluggable.

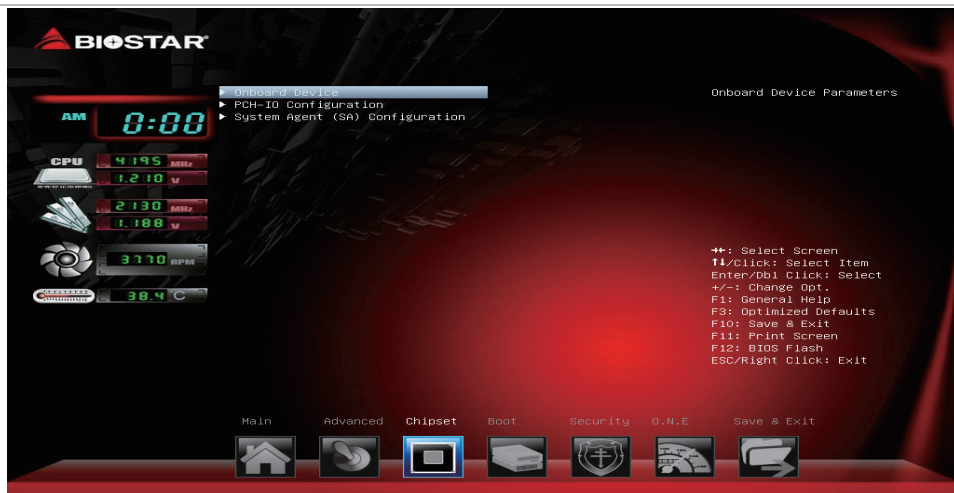
Options: Disabled (Default) / Enabled

3. Chipset Menu

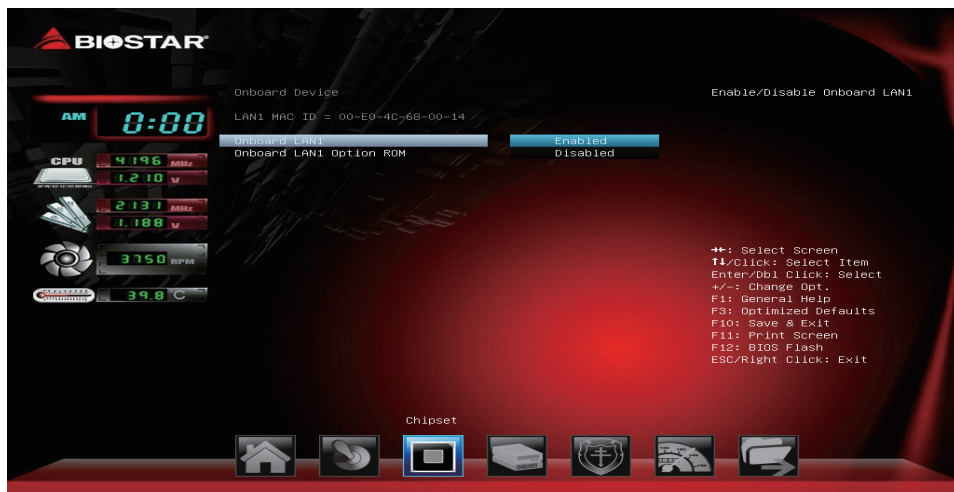
This section describes configuring the PCI bus system. PCI, or Personal Computer Interconnect, is a system which allows I/O devices to operate at speeds nearing the speed of the CPU itself uses when communicating with its own special components.

Note

» Beware of that setting inappropriate values in items of this menu may cause system to malfunction.



Onboard Device



Onboard LAN1

This item enables or disables Onboard LAN1.

Options: Enabled (Default) / Disabled

Onboard LAN1 Option ROM

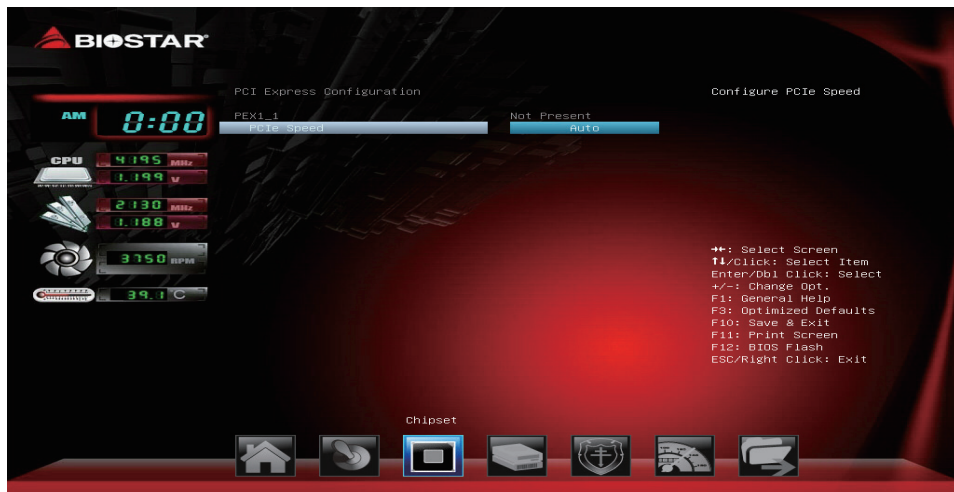
This item enables or disables Onboard LAN1 Option ROM.

Options: Disabled (Default) / Enabled

PCH-IO Configuration



PCI Express Configuration



PEX1_1

Options: Auto(Default) / Gen1 / Gen2 / Gen3

HD Audio

Control Detection of the HD-Audio device. Disabled = HDA will be unconditionally disabled.

Enabled = HDA will be unconditionally enabled. Auto = HDA will be enabled if present, disabled otherwise.

Options: Auto (Default) / Disabled / Enabled

ErP Control

When ErP is enabled, the system will meet ErP requirement.

Options: Disabled (Default) / Enabled in S4-S5

System Agent (SA) Configuration



Internal Graphics

This item keeps IGFX enabled based on the setup options.

Options: Auto (Default) / Disabled / Enabled

Primary Display

This item selects which of IGFX/PEG/PCI Graphics device should be Primary Display or select SG for Switchable Gfx.

Options: Auto (Default) / IGFX / PEG / PCI / SG

GTT Size

This item selects GTT Size.

Options: 8MB (Default) / 4MB / 2MB

Aperture Size

This item selects Aperture Size. Note : Above 4GB MMIO BIOS assignment is automatically enabled when selecting 2048MB aperture. To use this feature, please disable CSM Support.

Options: 256MB (Default) / 128MB / 512MB / 1024MB / 2048MB / 4096MB

DVMT Pre-Allocated

This item selects DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.

Options: 32M (Default) / 0M / 64M / 4M / 8M / 12M / 16M / 20M / 24M / 28M / 32M/F7 / 36M / 40M / 44M / 48M / 52M / 56M / 60M

DVMT Total Gfx Mem

This item selects DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device.

Options: 256MB (Default) / 128MB / MAX

PAVP Enable

This item enables or disables PAVP.

Options: Enabled (Default) / Disabled

Max TOLUD

Maximum Value of TOLUD. Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller.

Options: Dynamic (Default) / 1 GB / 1.25 GB / 1.5 GB / 1.75 GB / 2 GB / 2.25 GB / 2.5 GB / 2.75 GB / 3 GB / 3.25 GB / 3.5GB

VT-d

This item enables or disables VT-d capability.

Options: Enabled (Default) / Disabled

Above 4GB MMIO BIOS assignment

This item enables or disables above 4GB MemoryMappedIO BIOS assignment. This is disabled automatically when Aperture Size is set to 2048MB.

Options: Disabled (Default) / Enabled

RC6 (Render Standby)

This item enables or disables render standby support.

Options: Enabled (Default) / Disabled

PEX16_1

MAX Link Speed

Configure PEX16_1 Max Speed.

Options: Auto (Default) / Gen1 / Gen2 / Gen3

4. Boot Menu

This menu allows you to setup the system boot options.



Setup Prompt Timeout

This item sets number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.

Options: 1 (Default)

Bootup NumLock State

This item selects the keyboard NumLock state.

Options: On (Default) / Off

Full Screen Logo Display

This item enable or disable Full Screen Logo Show function.

Options: Enabled (Default) / Disabled

Boot Success Beep

When this item is set to Enabled, BIOS will let user know boot success with beep.

Options: Enabled (Default) / Disabled

BIOS Flash protection

While enabled, it can't flash write and flash erase by SMI.

Options: Enabled (Default) / Disabled

Fast Boot

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

Options: Disabled (Default) / Enabled

Note

» *The following items appear only when you set the Fast Boot function to [Enabled]*

SATA Support

If Last Boot HDD Only, Only last boot HDD device will be available in post. If all SATA devices, all SATA devices will be available in OS and post.

Options: All Sata Devices (Default) / Last Boot HDD Only

VGA Support

If Auto, only install Legacy OpRom with Legacy OS and logo would NOT be shown during post. EFI driver will still be installed with EFI OS.

Options: EFI Driver (Default) / Auto

USB Support

If Disabled, all USB devices will NOT be available until after OS boot. If Partial Initial, USB Mass Storage and specific USB port/device will NOT be available before OS boot. If Enabled, all USB devices will be available in OS and Post.

Options: Partial Initial (Default) / Full Initial / Disabled

PS2 Devices Support

If Disabled, PS2 devices will be skipped.

Options: Enabled (Default) / Disabled

Network Stack Driver Support

If Disabled, Network Stack Drivers will be skipped.

Options: Disabled (Default) / Enabled

Redirection Support

If disable, Redirection function will be disabled.

Options: Disabled (Default) / Enabled

GateA20 Active

Upon Request – GA20 can be disabled using BIOS services. Always – do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.

Options: Upon Request (Default) / Always

Option ROM Messages

This item sets the display mode for Option ROM.

Options: Force BIOS (Default) / Keep Current

CSM Support

This option enables or disables CSM support.

Options: Enabled (Default) / Disabled

Boot option filter

This option controls Legacy/UEFI ROMs priority.

Options: UEFI and Legacy (Default) / Legacy only / UEFI only

Network

This option controls the execution of UEFI and Legacy PXE OpROM

Options: Legacy (Default) / UEFI / Do not launch

Storage

This option controls the execution of UEFI and Legacy Storage OpROM

Options: Legacy (Default) / UEFI / Do not launch

Video

This option controls the execution of UEFI and Legacy Video OpROM

Options: Legacy (Default) / UEFI / Do not launch

Other PCI devices

This item determines OpROM execution policy for devices other than Network, Storage, or Video.

Options: UEFI (Default) / Legacy / Do not launch

Boot Option Priorities

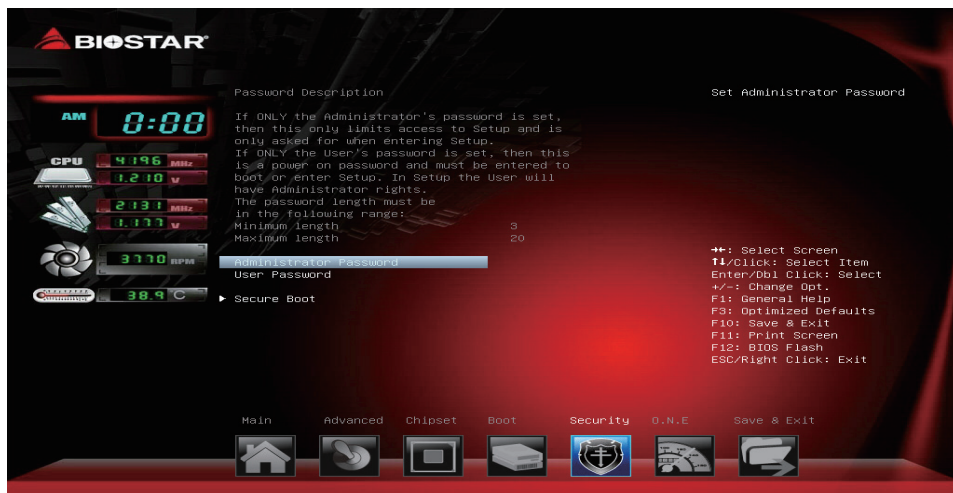
The items specify the boot device priority sequence from the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system.

New Boot Option Policy

This item controls the placement of newly detected UEFI boot options.

Options: Default (Default) / Place First / Place Last

5. Security Menu



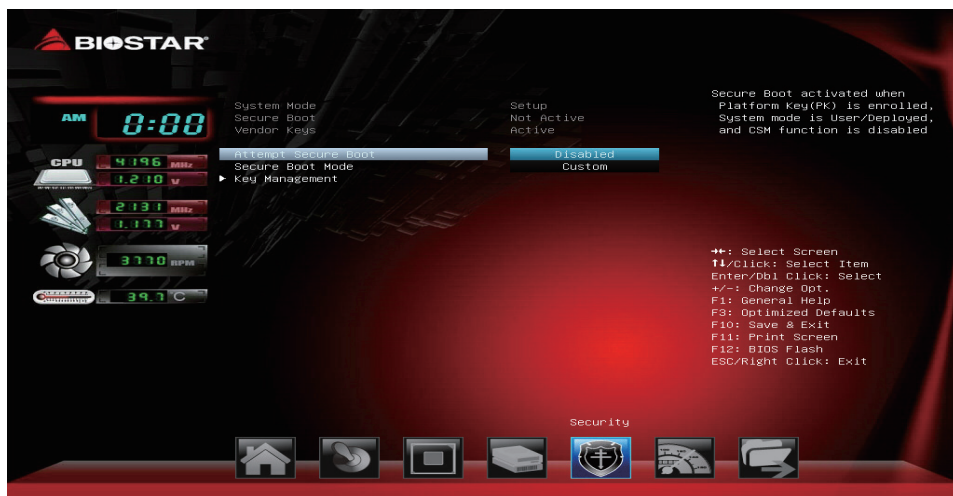
Administrator Password

This item sets Administrator Password.

User Password

This item sets User Password.

Secure Boot Menu



Attempt Secure Boot

Secure Boot activated when Platform Key (PK) is enrolled, System mode is User/Deployed, and CSM function is disabled.

Options: Disabled (Default) / Enabled

Secure Boot Mode

Secure Boot mode selector : Standard/Custom. In Custom mode Secure Boot Variables can be configured without authentication.

Options: Custom (Default) / Standard

Key Management



Provision Factory Default Keys

This item allows you to provision factory default Secure Boot Keys when system is in setup mode.

Options: Disabled (Default) / Enabled

Install Factory Default Keys

Force System to User Mode - install all Factory Default Keys(PK, KEK, , dbt, dbx). Change takes effect after reboot.

Enroll EFI Image

This item allows the image to run in Secure Boot mode. Enroll SHA256 hash of the binary into Authorized Signature Database(db).

Save all Secure Boot Variables

Save NVRAM content of all Secure Boot policy Variables to the files (EFI_SIGNATURE_LIST data format) in root folder on a target file system device.

Platform Key (PK)

Save to File – Allows you save to PK file.

Set new Key – Allows you set new PK file.

Erase Key – Allows you to erase the PK file from your system.

Key Exchange Keys

Save to File – Allows you save to KEK file.

Set new Key – Allows you set new KEK file.

Append Key – Allows you append Var to KEK.

Erase Key – Allows you to erase the KEK file from your system.

Authorized Signatures

Save to File – Allows you save to DB file.

Set new Key – Allows you set new DB file.

Append Key – Allows you append Var to DB.

Erase Key – Allows you to erase the DB file from your system.

Forbidden Signatures

Save to File – Allows you save to DBK file.

Set new Key – Allows you set new DBK file.

Append Key – Allows you append Var to DBX.

Erase Key – Allows you to erase the DBX file from your system.

Authorized Timestamps

Set new Key – Allows you set new DBT file.

Append Key – Allows you append Var to DBT.

OsRecovery Signatures

Set new Key – Allows you set new file.

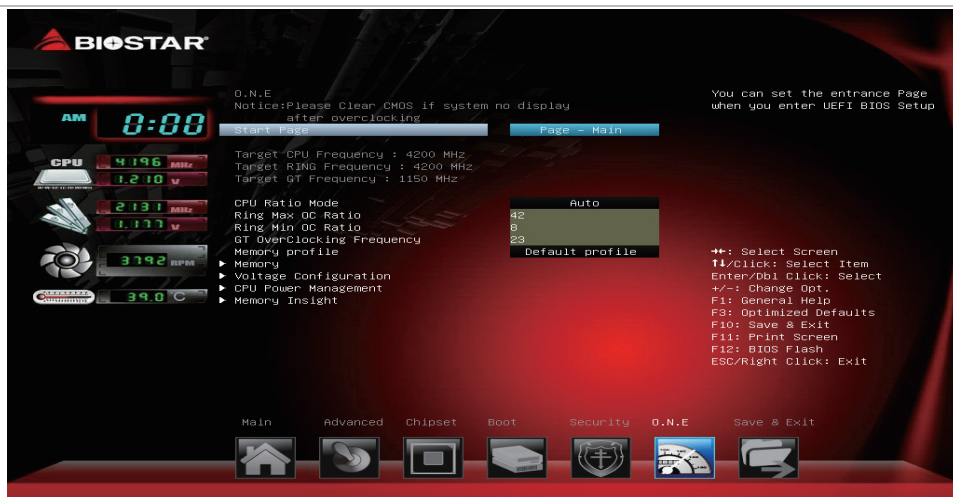
Append Key – Allows you append Var.

6. O.N.E Menu

This submenu allows you to change voltage and clock of various devices.

Note

- » We suggest you use the default setting. Changing the voltage and clock improperly may damage the device.
- » The options and default settings might be different by RAM or CPU models.
- » Beware of that setting inappropriate values in items of this menu may cause system to malfunction.
 - Values in Red: Danger
 - Values in Yellow: Warning
 - Values in White: Normal



Start Page

You can set the entrance page when you enter UEFI BIOS Setup.

Options: Page – Main (Default) / Page – Advanced / Page – Chipset / Page – Boot / Page – Security / Page – O.N.E / Page – Save & Exit

CPU Ratio Mode

This item sets CPU Ratio Mode.

Options: Auto (Default) / All Cores / Per Core / Fixed

CPU Ratio Mode

This item sets CPU Ratio Mode.

Options: Auto (Default) / All Cores / Per Core / Fixed

Note

- » The following items appear only when you set the CPU Ratio Mode function to [All Cores & Fixed]

Core Max OC Ratio

This item sets the maximum OC Ratio for the CPU Core and Ring.

Options: 45 (Default)

Note

» *The following items appear only when you set the CPU Ratio Mode function to [Per Core]*

1-Core Ratio Limit Override

This limit is for 1 cores active. 0 means using the factory-configured value.

Options: 45 (Default)

2-Core Ratio Limit Override

This limit is for 2 cores active. 0 means using the factory-configured value.

Options: 44 (Default)

3-Core Ratio Limit Override

This limit is for 3 cores active. 0 means using the factory-configured value.

Options: 44 (Default)

4-Core Ratio Limit Override

This limit is for 4 cores active. 0 means using the factory-configured value.

Options: 44 (Default)

Ring Max OC Ratio

This sets the maximum overclocking ratio for the Ring Domain.

Options: 42 (Default)

Ring Min OC Ratio

This sets the minimum overclocking ratio for the Ring Domain.

Options: 8 (Default)

GT OverClocking Frequency

Overclocked RPO Frequency (MLC Clk) in multiples of 50 MHz.

Options: 23 (Default)

Memory Profile

Select DIMM timing profile. The below values start with the currently running values and don't auto populate.

Options: Default profile (Default) / Custom profile

Note

» *The following items appear only when you set the Memory Profiles function to [Custom profile]*

Memory Reference Clock

This sets the memory reference clock in Automatic, 133MHZ or 100MHZ.

Options: Auto (Default) / 133 / 100

Memory Ratio

Automatic or the frequency will equal ratio times reference clock. Set to Auto to recalculate memory timings listed below.

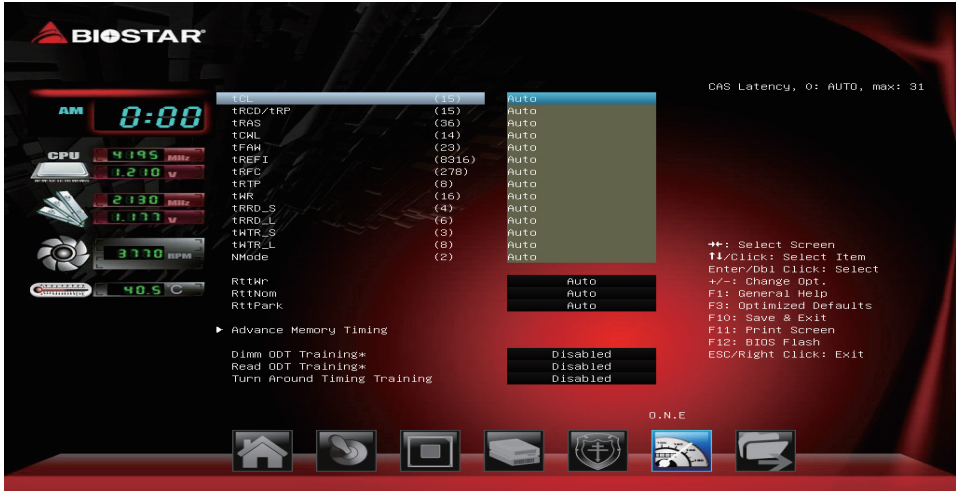
Options: Auto (Default) / DDR4 800MHz / DDR4 1066MHz / DDR4 1333MHz / DDR4 1600MHz / DDR4 1866MHz / DDR4 2133MHz / DDR4 2400MHz

QCLK Odd Ratio

Adds 133 or 100 MHz to QCLK frequency, depending on RefClk.

Options: Disabled (Default) / Enabled

Memory Timing Configuration



tCL

This item allows you to select CAS Latency, 0: AUTO, max: 31

Options: Auto (Default)

tRCO/tRP

This item allows you to select RAS to CAS delay time and Row Prechrg delay time, 0: AUTO, max: 63

Options: Auto (Default)

tRAS

This item allows you to select Row Active Time, 0: AUTO, max: 64

Options: Auto (Default)

tCWL

This item allows you to select Minimum CAS Write Latency Delay, 0: AUTO, max: 20

Options: Auto (Default)

tFAW

This item allows you to select Four Activate Window Delay Time, 0: AUTO, max: 63

Options: Auto (Default)

tREFI

This item allows you to select Refresh Interval, 0: AUTO, max: 65535

Options: Auto (Default)

tRFC

This item allows you to select Min Refresh Recovery Delay Time, 0: AUTO, max: 1023

Options: Auto (Default)

tRTP

This item allows you to select Min Internal Read to Precharge Command Delay Time. Shall be set to half of tWR value, 0: AUTO, max: 15. DDR4 legal values: 5, 6, 7, 8, 9, 10, 12

Options: Auto (Default)

tWR

This item allows you to select Min Write Recovery Time, 0: AUTO, legal values: 5, 6, 7, 8, 10, 12, 14, 16, 18, 20, 24

Options: Auto (Default)

tRRD_S

This item allows you to select Min Row Active to Row Active Delay Time, Different Bank Group 0: AUTO, max: 16

Options: Auto (Default)

tRRD_L

This item allows you to select Min Row Active to Row Active Delay Time, Same Bank Group 0: AUTO, max: 16

Options: Auto (Default)

tWTR_S

This item allows you to select Min Internal Write to Read Command Delay Time, 0: AUTO, max: 16

Options: Auto (Default)

tWTR_L

This item allows you to select Min Internal Write to Read Command Delay Time, Same Bank Group, 0: AUTO, max: 16

Options: Auto (Default)

NMode

This item allows you to select System command rate, range 0-2, 0 means auto, 1 = 1N, 2 = 2N

Options: Auto (Default)

RttWr

Options: Auto (Default) / Disabled / RZQ/1 / RZQ/2 / RZQ/3 / Hi-Z

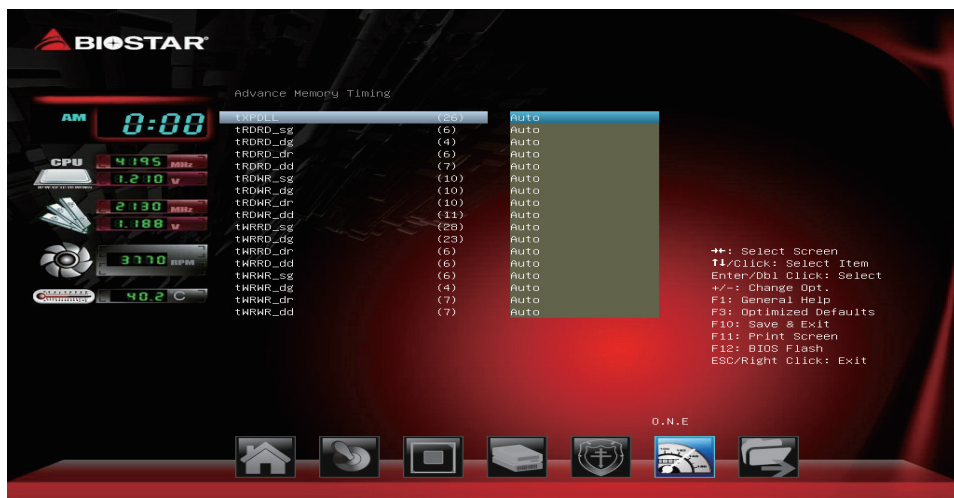
RttNom

Options: Auto (Default) / Disabled / RZQ/1 / RZQ/2 / RZQ/3 / RZQ/4 / RZQ/5 / RZQ/6 / RZQ/7

RttPark

Options: Auto (Default) / Disabled / RZQ/1 / RZQ/2 / RZQ/3 / RZQ/4 / RZQ/5 / RZQ/6 / RZQ/7

Advance Memory Timing



Dimm ODT Training*

Dimm On-Die Termination Training

Options: Disabled (Default) / Enabled

Read ODT Training*

Read On-Die Termination Training

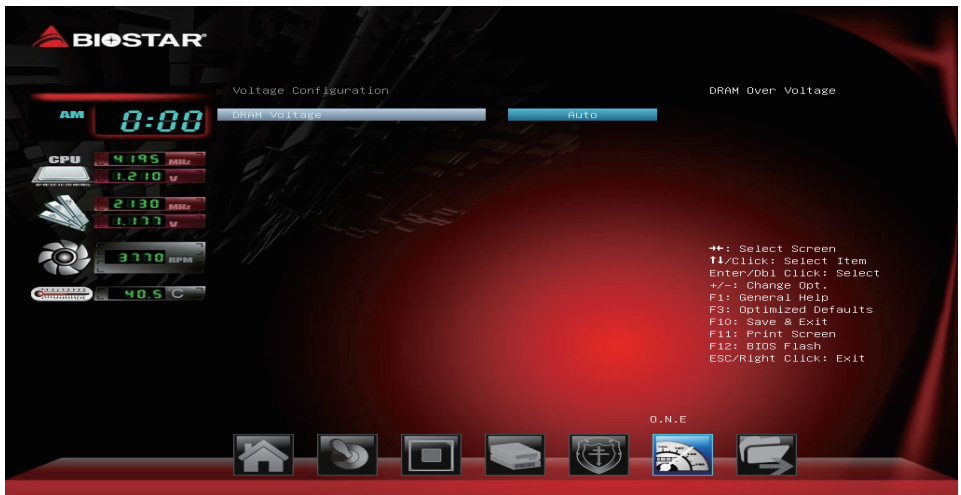
Options: Disabled (Default) / Enabled

Turn Around Timing Training

Turn Around Timing Training

Options: Disabled (Default) / Enabled

Voltage Configuration



DRAM Voltage

This item sets DRAM Over Voltage.

Options: Auto (Default) / 1.20V / 1.35V

CPU Power Management



Intel(R) SpeedStep(tm)

This item allows more than two frequency ranges to be supported.

Options: Enabled (Default) / Disabled

Power Limit 1 Override

This item enables or disables Power Limit 1 Override. If this option is disabled, BIOS will program the default values for Power Limit 1 and Power Limit 1 Time Window.

Options: Disabled (Default) / Enabled

Power Limit 2 Override

This item enables or disables Power Limit 2 Override. If this option is disabled, BIOS will program the default values for Power Limit 2.

Options: Enabled (Default) / Disabled

Power Limit 2

This item sets the Power Limit 2 value in Milli Watts. BIOS will round to the nearest 1/8W when programming. If the value is 0, BIOS will program this value as $1.25 \times \text{TDP}$. For 12.50W, enter 12500. Processor applies control policies such that the package power does not exceed this limit.

Options: 4095875(Default)

C states

This item enables or disables CPU Power Management. Allows CPU to go to C states when it's not 100% utilized.

Options: Auto (Default) / Enabled / Disabled

Enhanced C-states

This item enables or disables C1E. When enabled, CPU will switch to minimum speed when all cores enter C-State.

Options: Enabled (Default) / Disabled

C-state Auto Demotion

This item sets C-State Auto Demotion.

Options: C1 and C3 (Default) / C1 / C3/ Disabled

C-states Un-demotion

This item sets C-State Un-demotion.

Options: C1 and C3 (Default) / C1 / C3/ Disabled

Package C-state Demotion

This item sets Package C-state Demotion.

Options: Disabled (Default) / Enabled

Package C-state Un-demotion

This item sets Package C-state un-demotion.

Options: Disabled (Default) / Enabled

CState Pre-Wake

Disable - Sets bit 30 of POWER_CTL MSR(0x1FC) to 1 to disable the Cstate Pre-Wake.

Options: Enabled (Default) / Disabled

Package C State Limit

This item sets Package C State Limit. CPU Default value. Auto: Initializes to deepest available Package C State Limit.

Options: Auto (Default) / C0/C1 / C2 / C3 / C6 / C7 / C7s / C8 / C9 / C10 / CPU Default

CFG Lock

This item sets MSR 0xE2[15], CFG Lock bit.

Options: Enabled (Default) / Disabled

RSR

This item enables or disables Reliability Stress Restrictor (RSR) feature.

Options: Enabled (Default) / Disabled

AC Loadline

AC Loadline defined in 1/100 mOhms. A value of 100=1.00 mOhm, and 1255 = 12.55 mOhm. Range is 0-6249 (0-62.49 mOhms). 0 = AUTO/HW default.

Options: Auto (Default)

DC Loadline

DC Loadline defined in 1/100 mOhms. A value of 100 = 1.00 mOhm, and 1255 = 12.55 mOhm. Range is 0-6249 (0-62.49 mOhms). 0 = AUTO/HW default.

Options: Auto (Default)

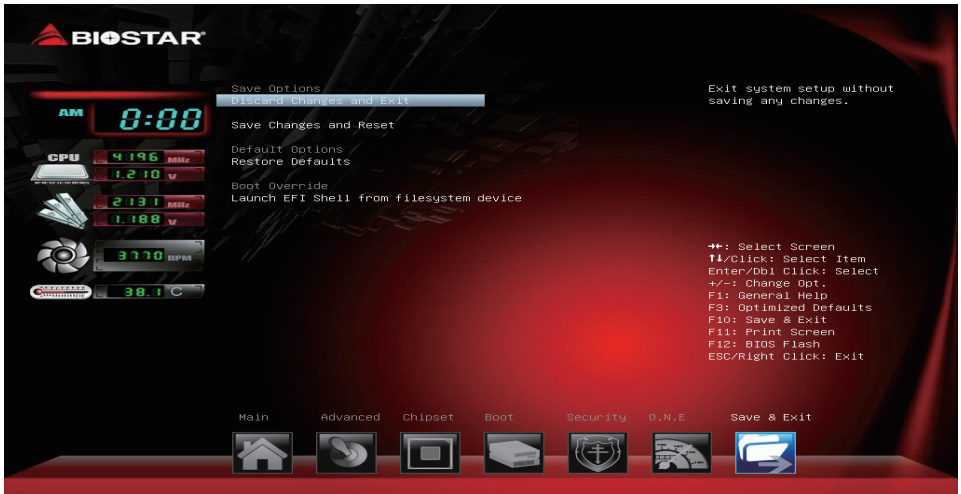
FCLK Frequency for Early Power On

FCLK frequency can take values of 400MHz, 800MHz and 1GHz (1GHz not supported for ULT/ULX SKUs).

Options: 1GHz (Default) / Normal (800Mhz) / 400MHz

7. Exit Menu

This menu allows you to load the optimal default settings, and save or discard the changes to the BIOS items.



Discard Changes and Exit

Abandon all changes made during the current session and exit setup.

Save Changes and Reset

Reset the system after saving the changes.

Restore Defaults

This selection allows you to reload the BIOS when problem occurs during system booting sequence. These configurations are factory settings optimized for this system.

Launch EFI Shell from filesystem device

This item attempts to launch EFI Shell application (Shellx64.efi) from one of the available filesystem devices.