

# BIOS User Guide

B250-BTC

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# 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.

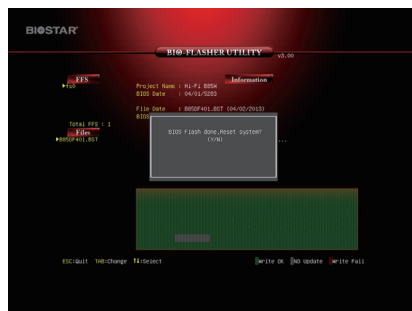
5. After entering the POST screen, the BIOS-FLASHER utility pops out. Choose <fs0> to search for the BIOS file.



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. A dialog pops out after BIOS flash is completed, asking you to restart the system. Press the <Y> key to restart system.



8. While the system boots up and the full screen logo shows up, press <DEL> 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.

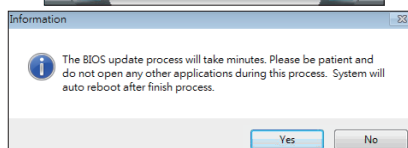
### **BIOS Update Utility (through the Internet)**

1. Installing BIOS Update Utility from the DVD Driver.
2. Please make sure the system is connected to the internet before using this function.

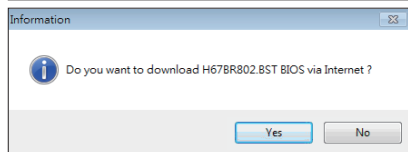
3. Launch BIOS Update Utility and click the "Online Update" button on the main screen.



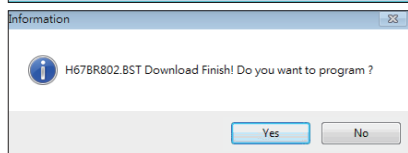
4. An open dialog will show up to request your agreement to start the BIOS update. Click "Yes" to start the online update procedure.



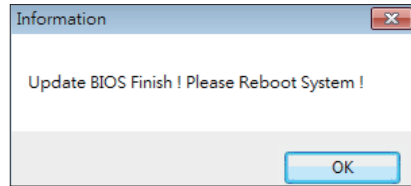
5. If there is a new BIOS version, the utility will ask you to download it. Click "Yes" to proceed.



6. After the download is completed, you will be asked to program (update) the BIOS or not. Click "Yes" to proceed.



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 <DEL> 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.

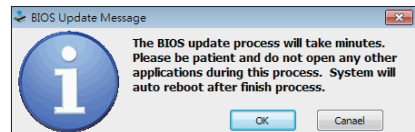
### **BIOS Update Utility (through a BIOS file)**

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.

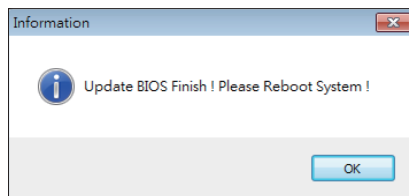


5. Choose the location for your BIOS file in the system. Please select the proper BIOS file, and then click on “Open”. It will take several minutes, please be patient.





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

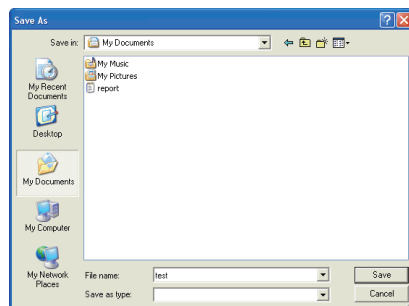


7. While the system boots up and the full screen logo shows up, press <DEL> key to enter BIOS setup.

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 <Del> 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.

## 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

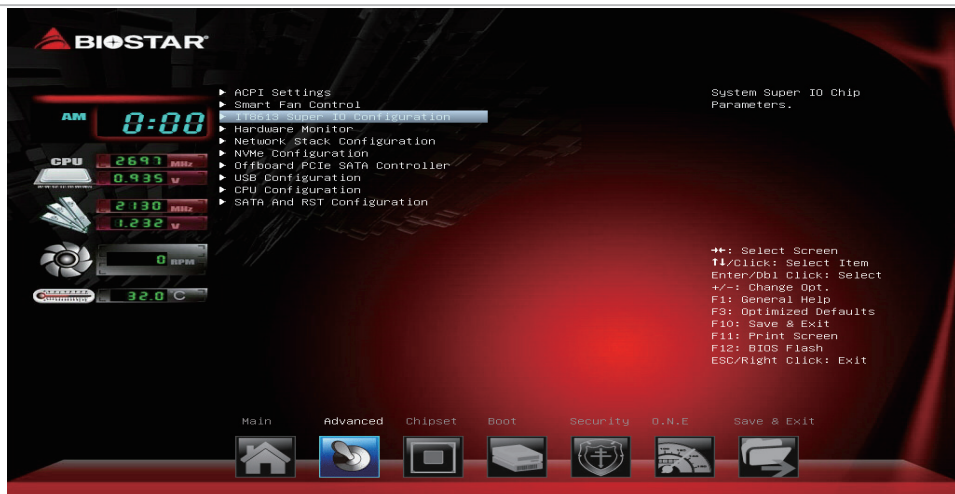
Set the system internal clock.

## 2. Advanced Menu

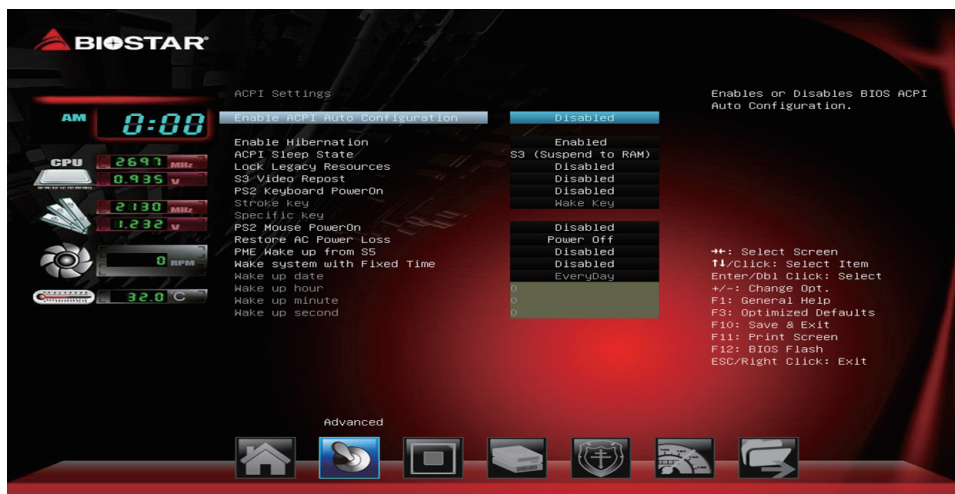
The Advanced Menu allows you to configure the settings of CPU, Super I/O, Power Management, and other system devices.

### 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 be not effective with some OS.

Options: Enabled (Default) / Disabled

**ACPI Sleep State**

This item selects the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.

Options: S3 (Suspend to RAM) (Default) / Suspend Disabled

**Lock Legacy Resources**

The item enables or disables Lock of Legacy Resources.

Options: Disabled (Default) / Enabled

**S3 Video Repost**

The item enables or disables S3 Video Repost.

Options: Disabled (Default) / Enabled

**PS2 Keyboard PowerOn**

This item allows you to control the keyboard power on function.

Options: Disabled (Default) / Any Key / Stroke Key / Specific Key

**Stroke Keys**

This item will show only when Keyboard PowerOn is set "Stroke Key."

Options: Wake Key (Default) / Power Key / Ctrl+F1 / Ctrl+F2 / Ctrl+F3 / Ctrl +F4 / Ctrl+F5 / Ctrl+F6

**Specific Key**

This item will show only when Keyboard PowerOn is set "Specific Key." Press Enter to set Specific key.

**PS2 Mouse PowerOn**

This item allows you to control the mouse power on function.

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

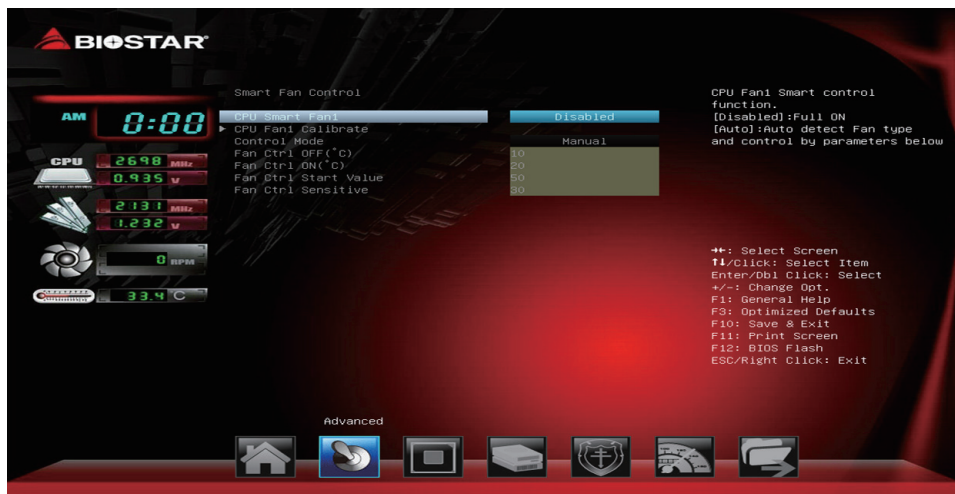
**Wake up date**

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 (default)/ Aggressive / Quiet

### 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)

## IT8613 Super IO Configuration



### Serial Port 1 Configuration



#### Serial Port

This item enable or disable Serial Port (COM).

Options: Enabled (Default) / Disabled

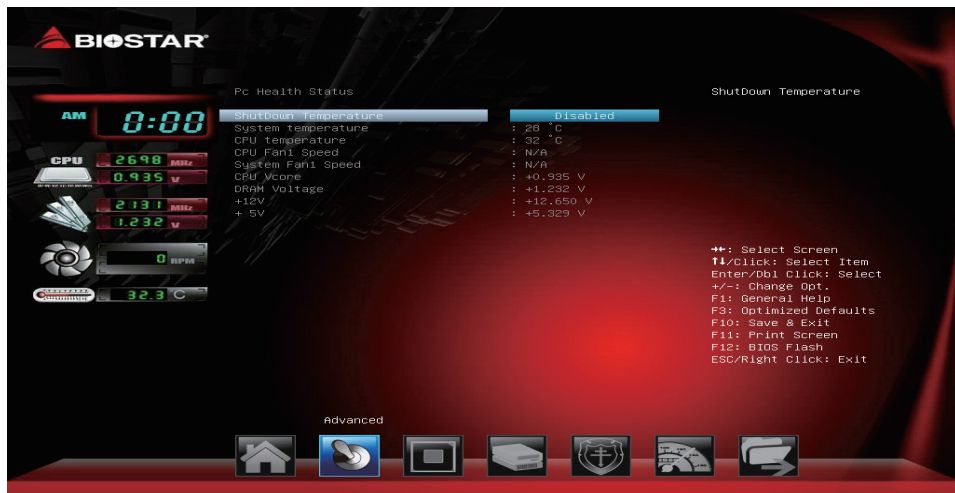
#### Change Settings

This item select an optimal settings for Super IO Device.

Options: Auto (Default) / IO=3F8h; IRQ=4 / IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12 / IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12 / IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12 / IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12



## 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**

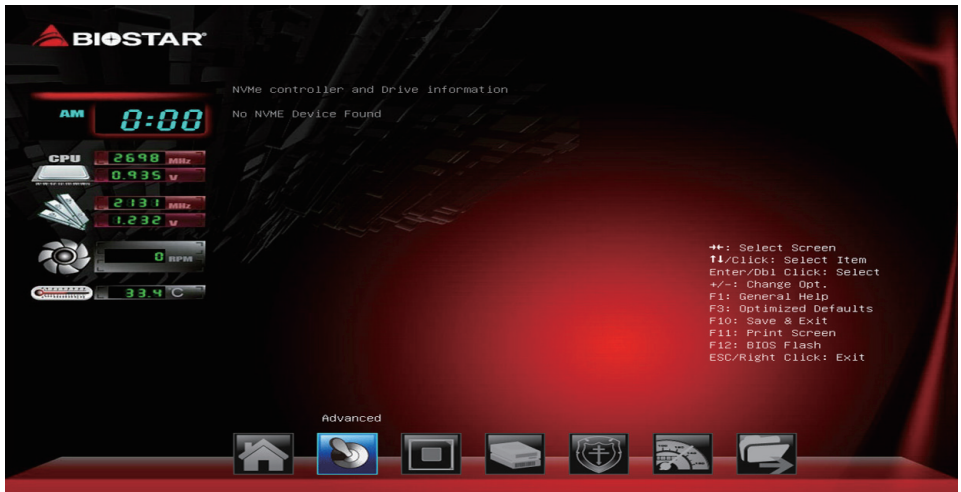
Wait time to press ESC key to abort the PXE boot.

**Media detect count**

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

“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

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### Note

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

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### Device power-up delay in seconds

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

Options: 5 (Default)

## USB FLASH DRIVE PMAP

This item 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

### Overclocking Lock

This item sets Overclocking lock.

Options: Disabled (Default) / Enabled

### Hardware Prefetcher

The processor has a hardware prefetcher that automatically analyzes its requirements and prefetches data and instructions from the memory into the Level 2 cache that are likely to be required in the near future. This reduces the latency associated with memory reads.

Options: Enabled (Default) / Disabled

### Adjacent Cache Line Prefetch

The processor has a hardware adjacent cache line prefetch mechanism that automatically fetches an extra 64-byte cache line whenever the processor requests for a 64-byte cache line. This reduces cache latency by making the next cache line immediately available if the processor requires it as well.

Options: Enabled (Default) / Disabled

### Intel (VMX) Virtualization Technology

Virtualization Technology can virtually separate your system resource into several parts, thus enhance the performance when running virtual machines or multi interface systems.

Options: Enabled (Default) / Disabled

### Active Processor Cores

Number of cores to enable in each processor package.

Options: A11 (Default) / 1

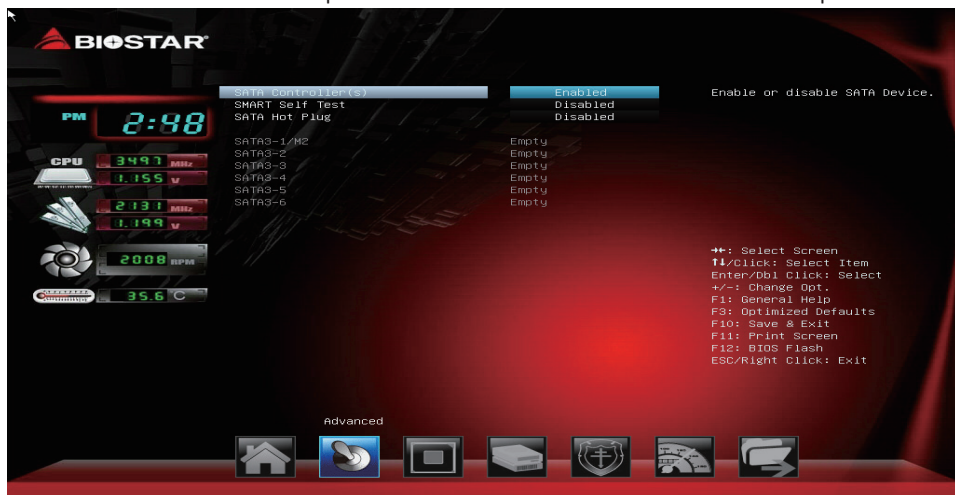
## AES

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/disables Serial ATA Device.

Options: Enabled (Default) / Disabled

### SATA Mode Selection

This item selects the determines how SATA controller(s) operate.

Options: AHCI (Default) / Intel RST With Intel Optane System Acceleration

### SMART Self Test

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

Options: Disabled (Default) / Enabled

### SATA Hot Plug

This item enables/disables SATA port as Hot Pluggable.

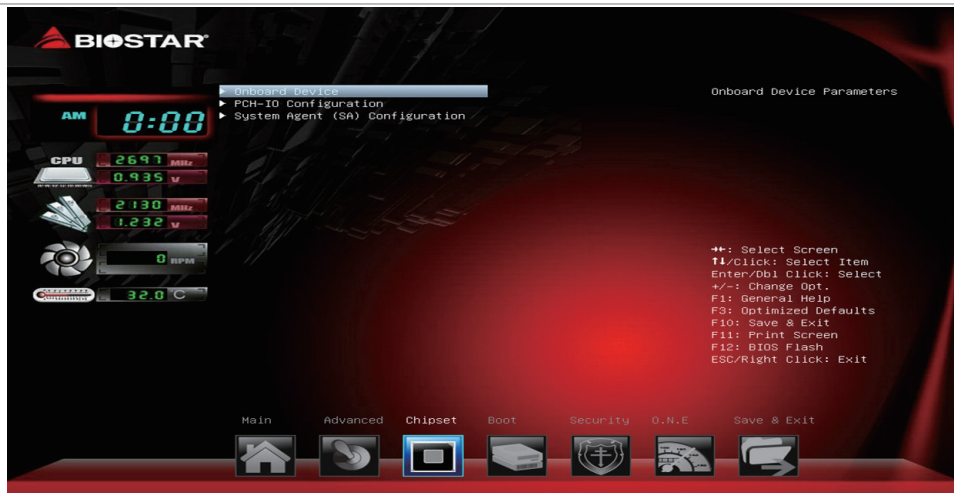
Options: Disabled (Default) / Enabled

## 3. Chipset Menu

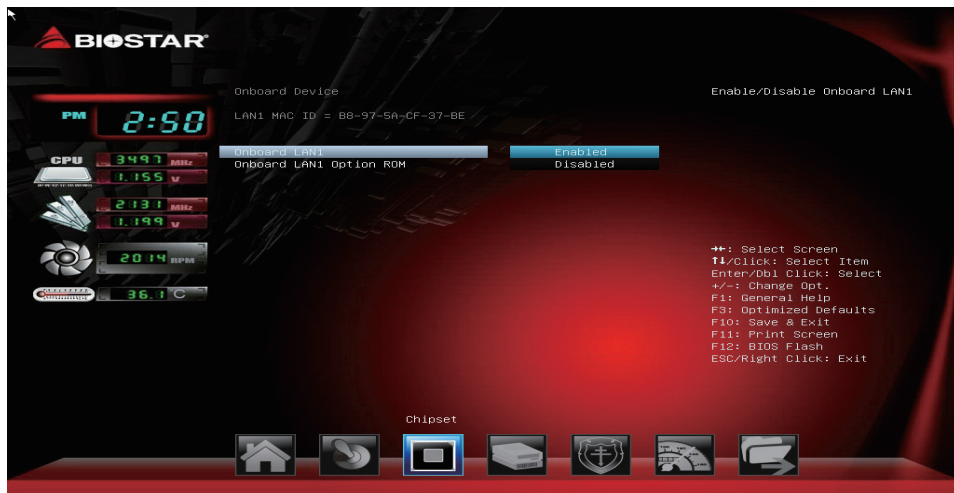
This section describes configuring the PCI bus system. PCI, or Personal Computer Interconnect, is a system which allows I/O devices to operate at speeds nearing the speed of the CPU itself uses when communicating with its own special components.

### Note

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



### Onboard Device



#### Onboard LAN1

This item enables/disables Onboard LAN1.

Options: Enabled (Default) / Disabled



## Onboard LAN1 Option ROM

This item enables/disables Onboard LAN1 Option ROM.

Options: Disabled (Default) / Enabled

## PCH-IO Configuration



## PCI Express Configuration



PEX1\_1/ PEX1\_2/ PEX1\_3/ PEX1\_4/ PEX1\_5/

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 enabled.

Options: Auto (Default) / Disabled / Enabled

## EuP Control

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

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

## System Agent (SA) Configuration



## Internal Graphics

This item keeps IGD 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.

## 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

**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.

Options: 1 (Default)

### Bootup NumLock State

This item selects the keyboard NumLock state.

Options: On (Default) / Off

### Full Screen Logo Display

This item allows you to enable/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: Disabled (Default) / Enabled

### Fast Boot

This item allows you to enable/disable 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**

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 installed with EFI.

Options: EFI Driver (Default) / Auto

**USB Support**

If Disabled, all USB devices will NOT be available until after OS boot. If Partial Initial, 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 what devices system can boot to.

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 device

For PCI devices other than Network, Mass storage or video defines which OpROM to launch.

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

### Boot Option Priorities

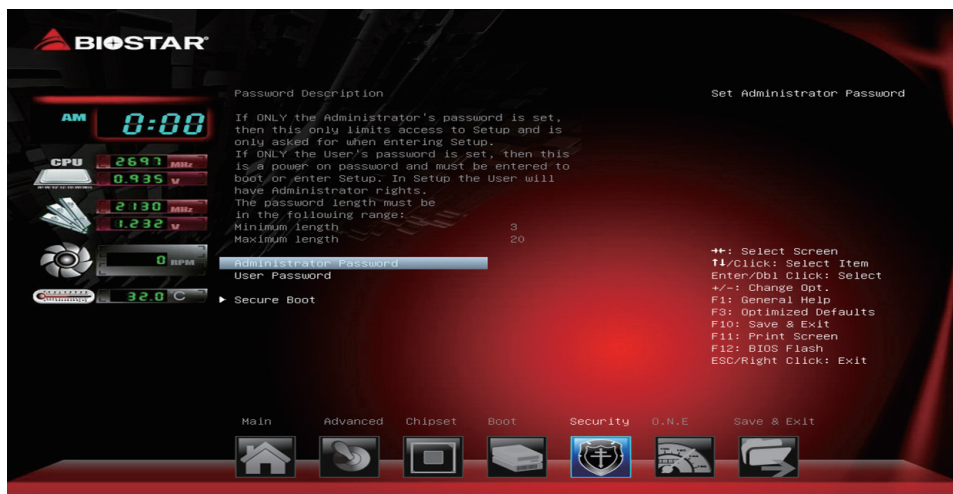
The items specify the boot device priority sequence from the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system.

### New Boot Option Policy

It controls the placement of newly detected UEFI boot options.

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

## 5. Security Menu



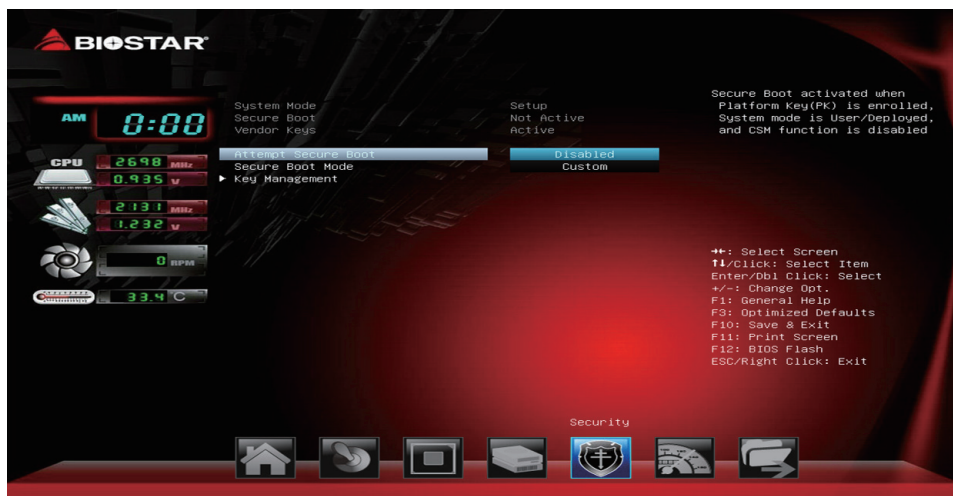
### Administrator Password

This item sets Administrator Password.

### User Password

This item sets User Password.

### Secure Boot Menu



## Attempt Secure Boot

Secure Boot can be enabled if 1. System running in user mode with enrolled Platform Key(PK)  
2.CSM function is disabled.

Options: Disabled (Default) / Enabled

## Secure Boot Mode

Secure Boot mode selector. 'Custom' mode enables users to change Image Execution policy and manage Secure Boot Keys.

Options: Custom (Default) / Standard

## Key Management



### Provision Factory Default Keys

Install 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. Change takes effect after reboot.

### Enroll Efi Image

Allow 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 Key to File – Allows you save key to PK file.

Set new Key – Allows you set new PK file.

Erase Key – Allows you erase PK file.

### Key Exchange Keys

Save Key to File – Allows you save key to KEK file.

Set new Key – Allows you set new KEK file.

Append Key – Allows you append Var to KEK.

Erase Key – Allows you erase KEK file.

**Authorized Signatures**

Save Key to File – Allows you save key to DB file.

Set new Key – Allows you set new DB file.

Append Key – Allows you append Var to DB.

Erase Key – Allows you erase DB file.

**Forbidden Signatures**

Save Key to File – Allows you save key to DBX file.

Set new Key – Allows you set new DBX file.

Append Key – Allows you append Var to DBX.

Erase Key – Allows you erase DBX file.

**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 DBT file.

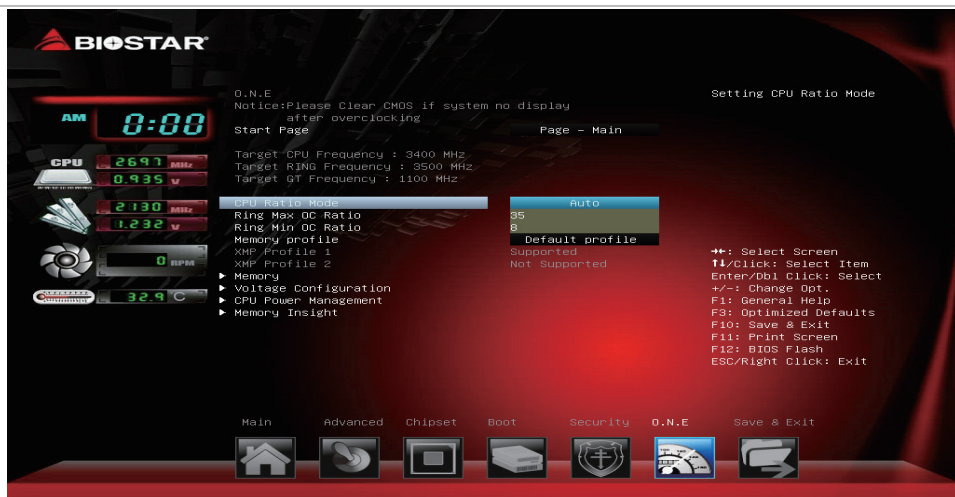
Append Key – Allows you append Var to DBT.

## 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

### Ring Max OC Ratio

This sets the maximum overclocking ratio for the Ring Domain.

Options: 35 (Default)

### Ring Min OC Ratio

This sets the minimum overclocking ratio for the Ring Domain.

Options: 8 (Default)



## Memory Profile

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

Options: Default profile (Default) / Custom profile / XMP profile 1

### Note

- » Support XMP only for Kabylake CPU. Max supports up to 2400MHz.
- » The following items appear only when you set the Memory Profiles function to [Custom profile]

## 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 ReClk.

Options: Disabled (Default) / Enabled

## Memory



### tCL

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

Options: Auto (Default)

### tRCD/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 Range, 0: AUTO, max: 20

Options: Auto (Default)

**tFAW**

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

Options: Auto (Default)

**tREFI**

This item allows you to select Maximum tREFI time,, 0: AUTO, max: 65535

Options: Auto (Default)

**tRFC**

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

Options: Auto (Default)

**tRTP**

This item allows you to select Read to Precharge Delay, 0: AUTO, max: 15. DDR4 legal values: 5, 6, 7, 8, 9, 10, 12

Options: Auto (Default)

**tWR**

This item allows you to select Internal Write to Read Command Delay, 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: 10

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: 15

Options: Auto (Default)

**tWTR\_S**

This item allows you to select Min Internal Write to Read Command Delay Time, Different Bank Group, 0: AUTO, max: 4

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: 11

Options: Auto (Default)

**NMode**

This item allows you to select System command rate, range 0-2, 0 = 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



## CPU Load-Line Calibration

This item Adjust CPU LLC .

Options: Enabled (Default) / Disabled

## CPU Vcore Over Voltage

This item sets CPU Vcore Over Voltage.

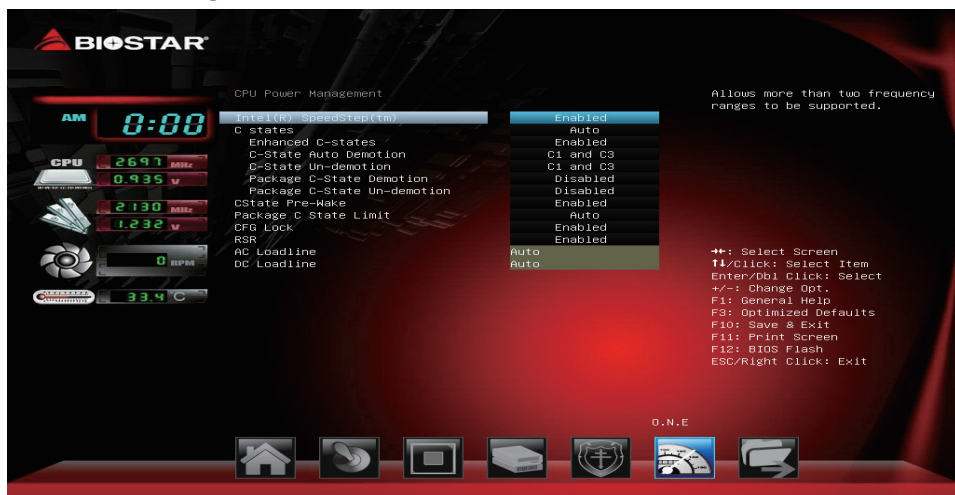
Options: Auto (Default) / Override / Adaptive

## 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

## 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-states 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 undemotion.

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.

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.

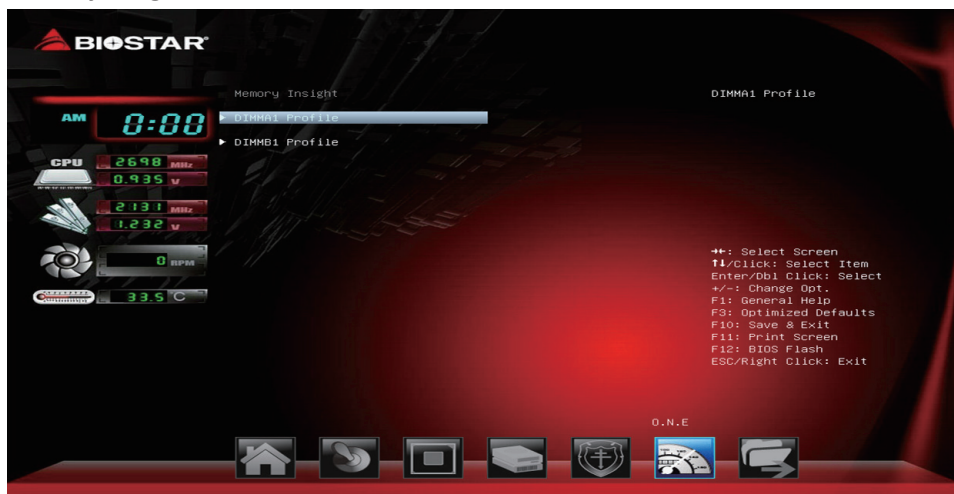
Options: Auto (Default)

## 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)

## Memory Insight



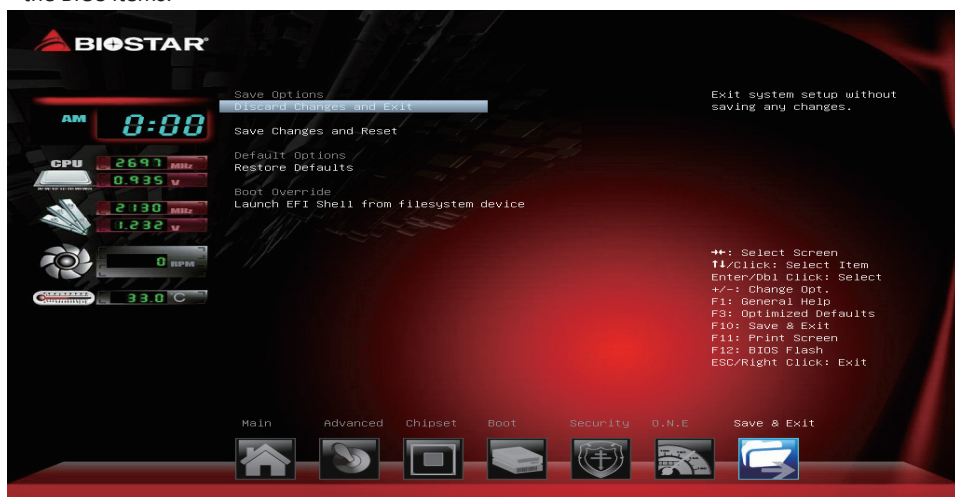
## DIMM Profile

These items display memory information.



## 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 EFI Shell application (Shellx64.efi) from one of the available filesystem devices.