

# BIOS User Guide

X470GT8

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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

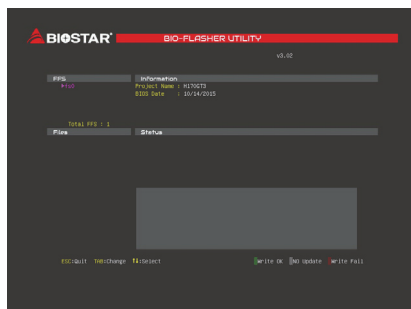
#### ► Note

- » 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.

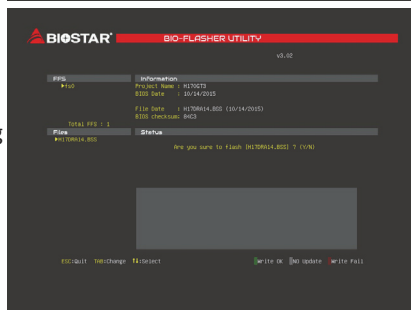
#### Updating BIOS with BIOSTAR BIOS-FLASHER

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.

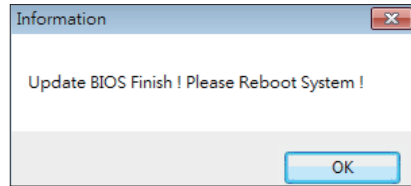


6. Select the proper BIOS file, and a message asking if you are sure to flash the BIOS file. Click "Yes" to start updating BIOS.





7. 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.

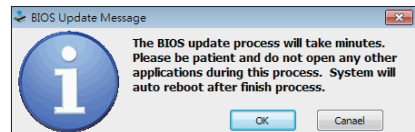
### **BIOS Update Utility (through a BIOS file)**

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.

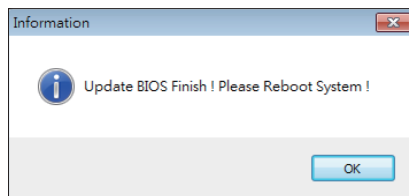


5. Choose the location for your BIOS file in the system. Please select the proper BIOS file, and then click on “Open”. It will take several minutes, please be patient.





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

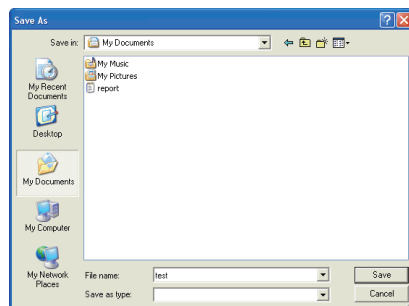


7. While the system boots up and the full screen logo shows up, press <DEL> key to enter BIOS setup.

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.

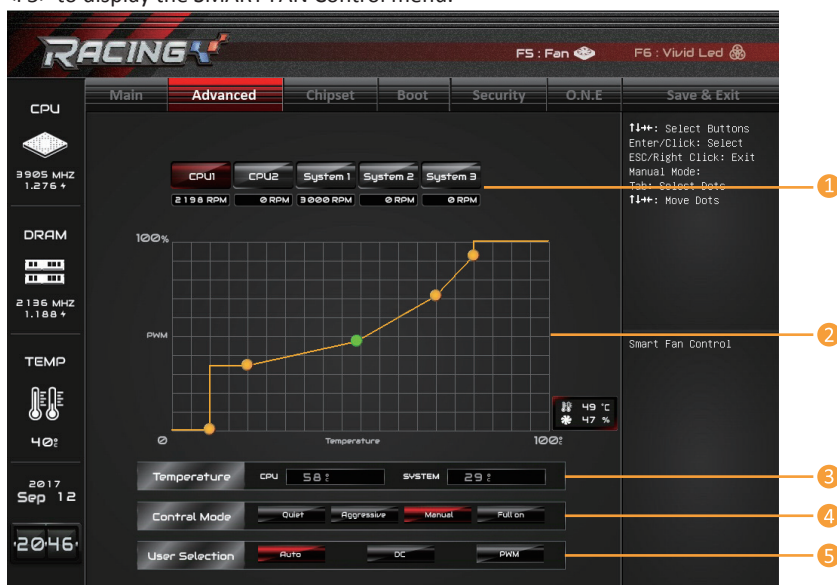
In the UEFI BIOS setup utility, you will see **General Help** description at the top right corner, and this is providing a brief description of the selected item. **Navigation Keys** for that particular menu are at the bottom right corner, and you can use these keys to select item and change the settings.

### 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.

## SMART FAN Control

Press <F5> to display the SMART FAN Control menu.



1. **CPU1/2 RPM & SYSTEM1/2/3 RPM:** Click button to set the status value of CPU and system fan.
2. **PWM/Temperature Panel:** According to the fan PWM value corresponding to CPU and system temperature to adjust the fan speed.  
» Allows you to adjust according to your preferences.
3. **Temperature:** Shows the current CPU and system temperature.
4. **Control Mode:** Allows you to control mode of the fans.
  - **Quiet:** Enable Quiet mode.
  - **Aggressive:** Enable Aggressive mode.
  - **Manual:** Enable Manual mode.
  - **Full on:** Enable Full On mode.
5. **User Selection:** Sets the fan property controls the actual selection operation.
  - **Auto:** Allows you to adjust the Automatic detection Mode.
  - **DC:** Allows you to adjust the Direct Current (DC) Mode.
  - **PWM:** Allows you to adjust the Pulse Width Modulation (PWM) Mode.

### Note

- » Menu contents will be different slightly, depending on different motherboard of users' computers.
- » Once you are finished making your selections, choose the <Save & Exit> menu to save.

## VIVID LED Control

Press <F6> to display the VIVID LED Control menu.



1. **LED SPARKLE:** Allows to you choose sparkle of the LEDs.

- **Permanent:** LEDs are constantly lit.
- **Breath:** LEDs gradually flash on and off.
- **Shine:** LEDs flash at a specific frequency.
- **OFF:** Allows you to enable or disable VIVID LED of a single item.

2. **LED COLOR:**

- **Auto:** LEDs will Automatically change the Color Palette and LED Brightness.
- » If you select Auto mode, the Color Palette and LED Brightness Bar will disabled.

- **Default:** All the setting are back to default.

3. **LED Type:** Select the LED lighting blocks.

- **RGB Header 1:** The header 1 LED illumination. (RGB LED Device)
  - **RGB Header 2:** The header 2 LED illumination. (RGB LED Device)
  - **RGB Audio:** The RGB Audio LED illumination. (On board LED or VIVID LED ARMOR)
- » This item will no support LED COLOR function.
- **System:** System LED illuminations. (MOSFET Heatsink LED, Southbridge Heatsink LED)

4. **ON/OFF:** To enable or disable VIVID LED function.

5. **Color Palette:** Allows to you choose specific color of the LEDs.

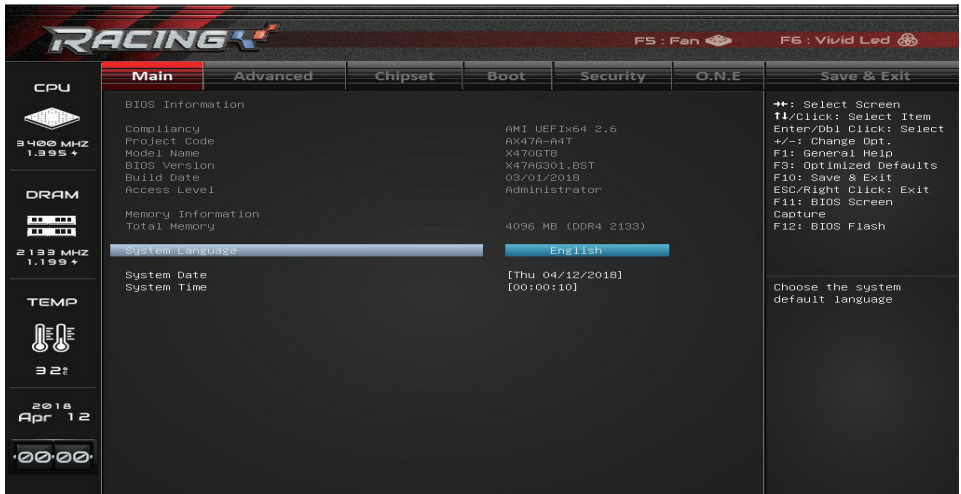
6. **LED Brightness Bar:** Allows you to adjust the LED brightness.

### Note

- » Menu contents will be different slightly, depending on different motherboard of users' computers.
- » Once you are finished making your selections, choose the <Save & Exit> menu to save.

# 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

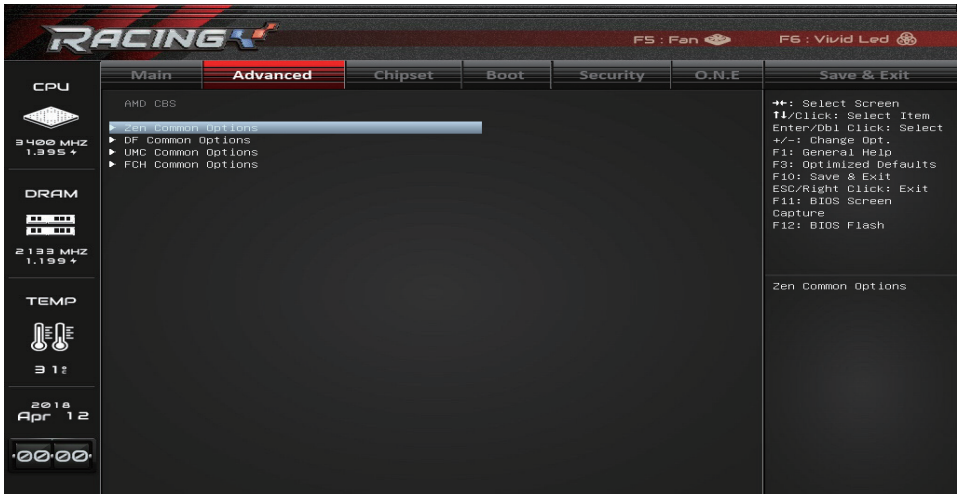
The Advanced Menu allows you to configure the settings of CPU, Super I/O, Power Management, and other system devices.

**Note**

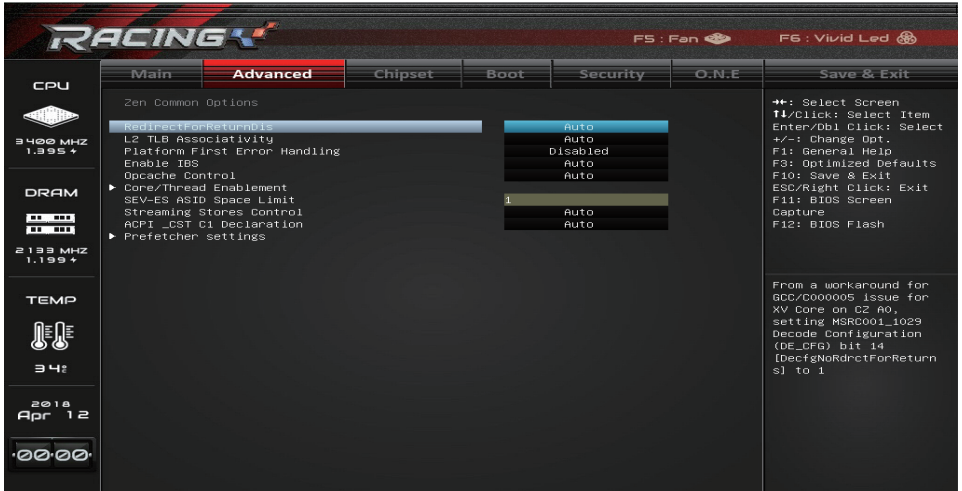
» Beware of that setting inappropriate values in items of this menu may cause system to malfunction.



### AMD CBS



## Zen Common Options



### RedirectForReturnDis

This item from a workaround for GCC/C000005 issue for XV Core on CZ A0, setting MSRC001\_1029 Decode Configuration (DE\_CFG) bit 14 [DecfgNoRdrctForReturns] to 1.  
Options: Auto (Default) / 1 / 0

### L2 TLB Associativity

This item 0 - L2 TLB ways [11:8] are fully associative. 1 - L2 TLB ways [11:8] are 4K-only.  
Options: 1 (Default) / 0 / Auto

### Platform First Error Handling

This item enabled or disabled PFEH, cloak individual banks, and mask deferred error interrupts from each bank.

Options: Disabled (Default) / Enabled / Auto

### Enable IBS

This item allows you to set the Enable IBS.

Options: Auto (Default) / Enabled / Disabled

### Opcache Control

This item enables or disables the Opcache Control.

Options: Auto (Default) / Enabled / Disabled

### Core/Thread Enablement

This item allows you to set the Core/Thread Enablement.

### SEV-ES ASID Space Limit

This item SEV VMs using ASIDs below the SEV-ES ASID Space Limit must enable the SEV-ES feature.

Options: 1 (Default)

### Streaming Stores Control

This item enables or disables the streaming stores functionality.

Options: Auto (Default) / Disabled / Enabled

## ACPI \_CST C1 Declaration

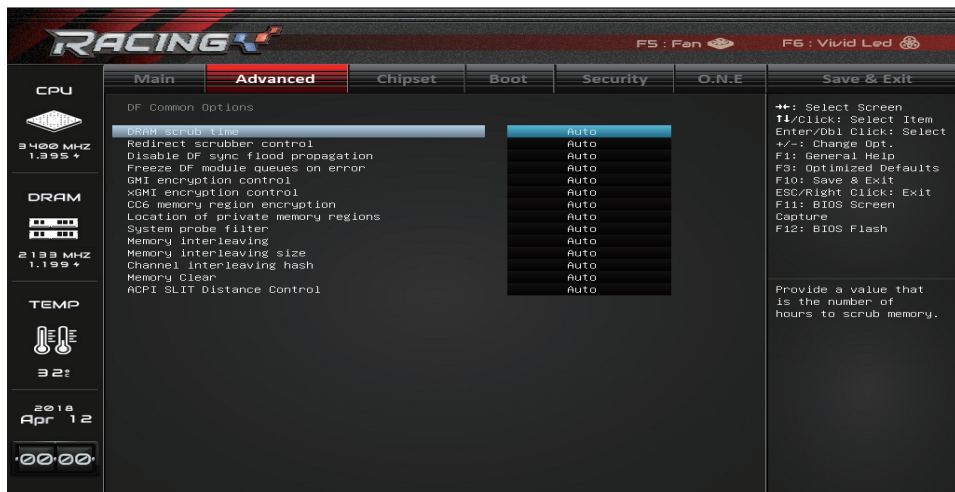
This item determines whether or not to declare the C1 state to the OS.

Options: Auto (Default) / Enabled / Disabled

## Prefetcher settings

This item allows you to sets Prefetcher settings.

## DF Common Options



### DRAM scrub time

This item provide a value that is the number of hours to scrub memory.

Options: Auto (Default) / Disabled / 1 hour / 4 hour / 8 hour / 16 hour / 24 hour / 48 hour

### Redirect scrubber control

This item control DF::RedirScrubCtrl [EnRedirScrub].

Options: Auto (Default) / Disabled / Enabled

### Disable DF sync flood propagation

This item control DF::PIEConfig [DisSyncFloodProp].

Options: Auto (Default) / Sync flood disabled / Sync flood Enabled

### Freeze DF module queues on error

This item control DF::PIEConfig [DisImmSyncFloodOnFatalError]. Disabling this option sets DF:PIEConfig[DisImmSyncFloodOnFatalError]

Options: Auto (Default) / Disabled / Enabled

### GMI encryption control

This item control GMI link encryption.

Options: Auto (Default) / Disabled / Enabled

### xGMI encryption control

This item control xGMI link encryption.

Options: Auto (Default) / Disabled / Enabled

### CC6 memory region encryption

This item control whether or not the CC6 save/restore memory is encrypted.

Options: Auto (Default) / Disabled / Enabled



**Location of private memory regions**

This item control whether or not the private memory regions (PSP, SMU and CC6) are at the top of DRAM or distributed.

Options: Auto (Default) / Distributed / Consolidated

- » *Note that distributed requires memory on all dies.*
- » *Note that it will always be at the top of DRAM if some dies don't have memory regardless of this option's setting.*

**System probe filter**

This item controls whether or not the probe filter is enabled. Has no effect on parts where the probe filter is fuse disabled.

Options: Auto (Default) / Disabled / Enabled

**Memory interleaving**

This item controls fabric level memory interleaving (AUTO, none, channel, die, socket).

Options: Auto (Default) / None / Channel / Die / Socket

- » *Note that channel, die, and socket has requirements on memory populations and it will be ignored if the memory doesn't support the selected option.*

**Memory interleaving size**

This item controls the memory interleaving size. The valid values are AUTO, 256 bytes, 512 bytes, 1 Kbytes or 2Kbytes. This determines the starting address of the interleave (bit 8, 9, 10 or 11).

Options: Auto (Default) / 256 Bytes / 512 Bytes / 1 KB / 2 KB

**Channel interleaving hash**

This item controls whether or not the address bits are hashed during channel interleave mode.

This field should not be used unless the interleaving is set to channel and the interleaving size is 256 or 512 bytes.

Options: Auto (Default) / Disabled / Enabled

**Memory Clear**

This item allows you to set Memory Clear. When this feature is disabled, BIOS does not implement MemClear after memory training (only if non-ECC DIMMs are used).

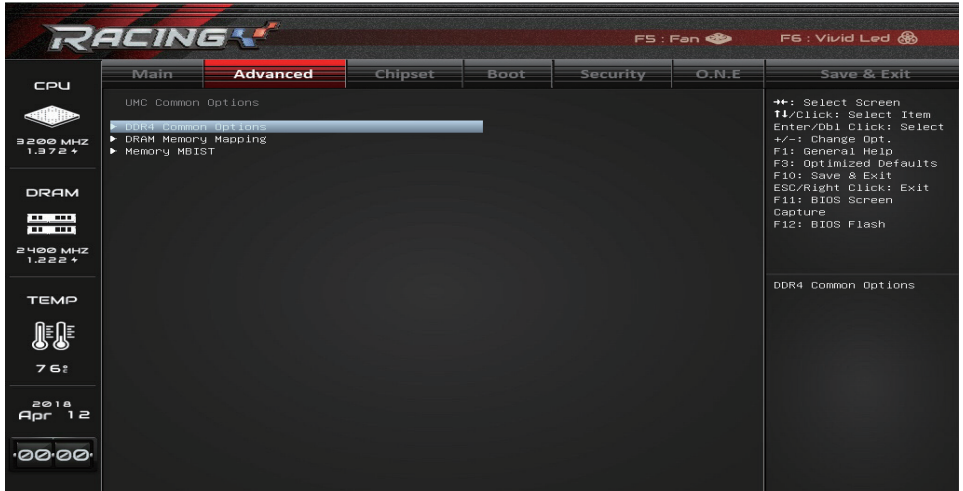
Options: Auto (Default) / Disabled / Enabled

**ACPI SLIT Distance Control**

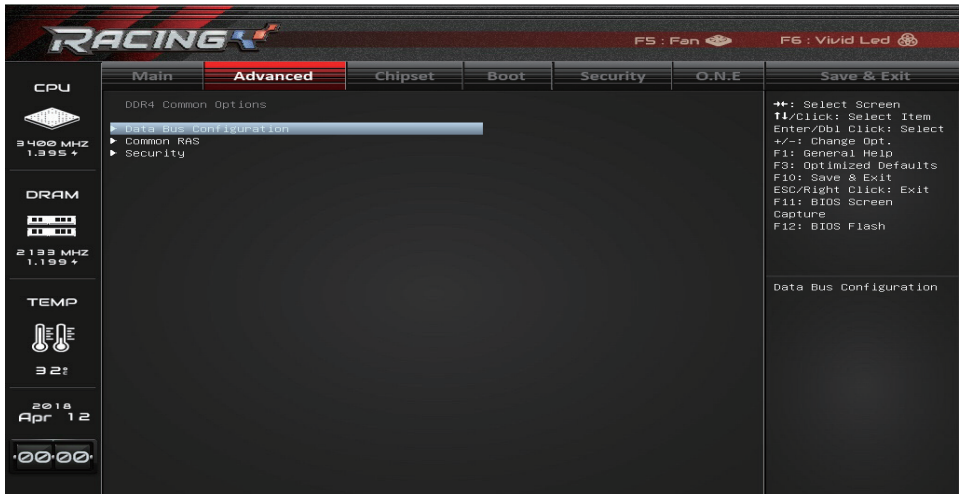
This item determines how the SLIT distances are declared.

Options: Auto (Default) / Hardware / Local / Max 2 Distances / Max 3 Distances

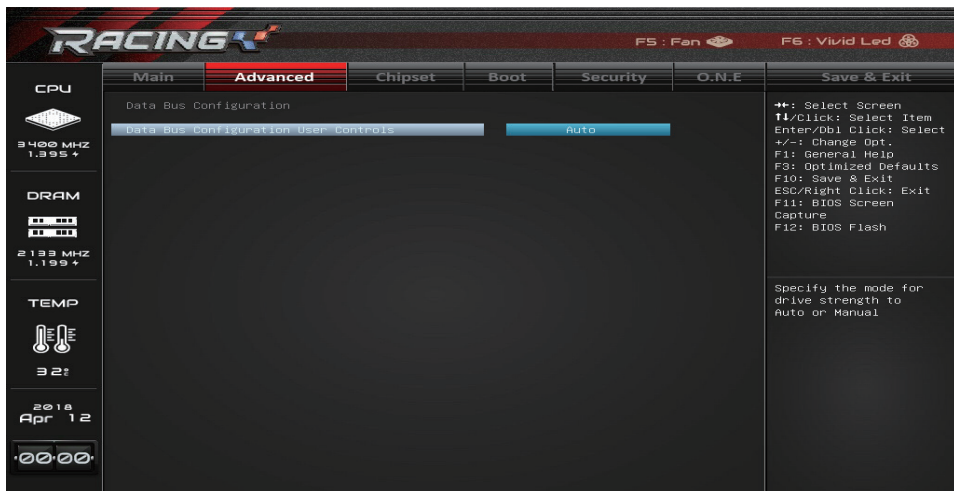
## UMC Common Options



## DDR4 Common Options



## Data Bus Configuration



### Data Bus Configuration User Controls

This item specifies the mode for drive strength to Auto or Manual.

Options: Auto (Default) / Manual

#### Note

» The following items appear only when you set the Data Bus Configuration User Controls function to [Manual].

#### RttNom

Options: Auto (Default) / Rtt\_Nom Disable / RZQ/4 / RZQ/2 / RZQ/6 / RZQ/1 / RZQ/5 / RZQ/3 / RZQ/7

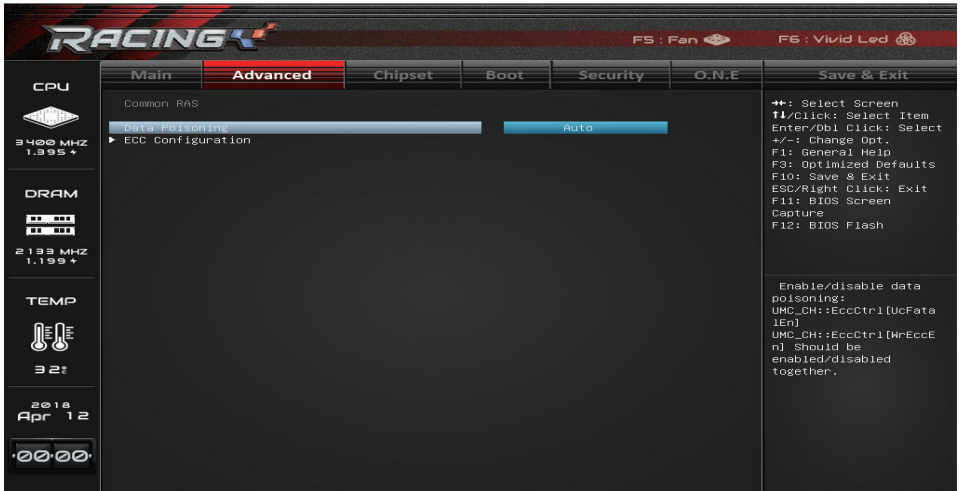
#### RttWr

Options: Auto (Default) / Dynamic ODT Off / RZQ/2 / RZQ/1 / Hi-Z / RZQ/3

#### RttPark

Options: Auto (Default) / Rtt\_PARK Disable / RZQ/4 / RZQ/2 / RZQ/6 / RZQ/1 / RZQ/5 / RZQ/3 / RZQ/7

## Common RAS

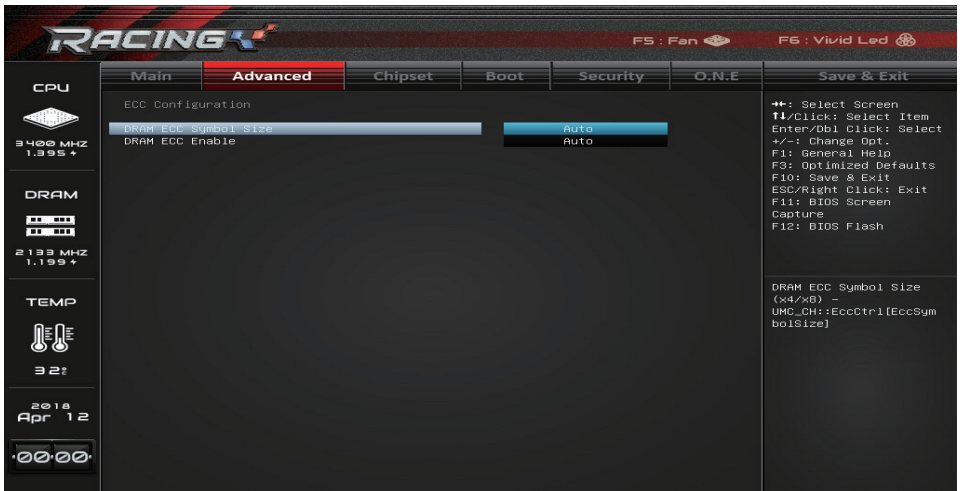


### Data Poisoning

This item enables or disabled data poisoning: UMC\_CH::EccCtrl [UcFatalEn] ; UMC\_CH::EccCtrl[WrrEccEn] Should be enabled / disabled together.

Options: Auto (Default) / Disabled / Enabled

### ECC Configuration



### DRAM ECC Symbol Size

This item DRAM ECC Symbol Size (x4/x8) - UMC\_CH::EccCtrl[EccSymbolSize].

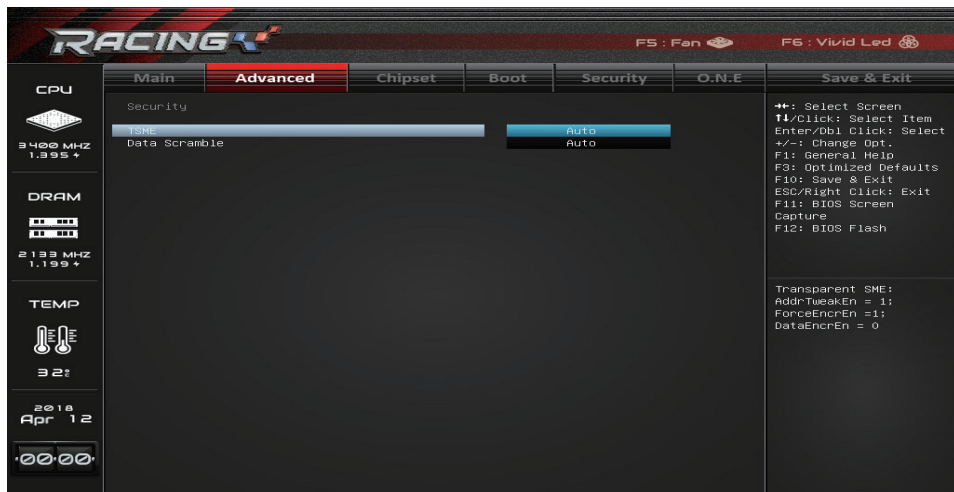
Options: Auto (Default) / x4 / x8

### DRAM ECC Enable

This item enables or disables DRAM ECC. Auto will set ECC to enable

Options: Auto (Default) / Disabled / Enabled

## Security



### TSME

This item transparent SME: AddrTweakEn = 1 ; ForceEncrEn = 1 ; DataEncrEn = 0.

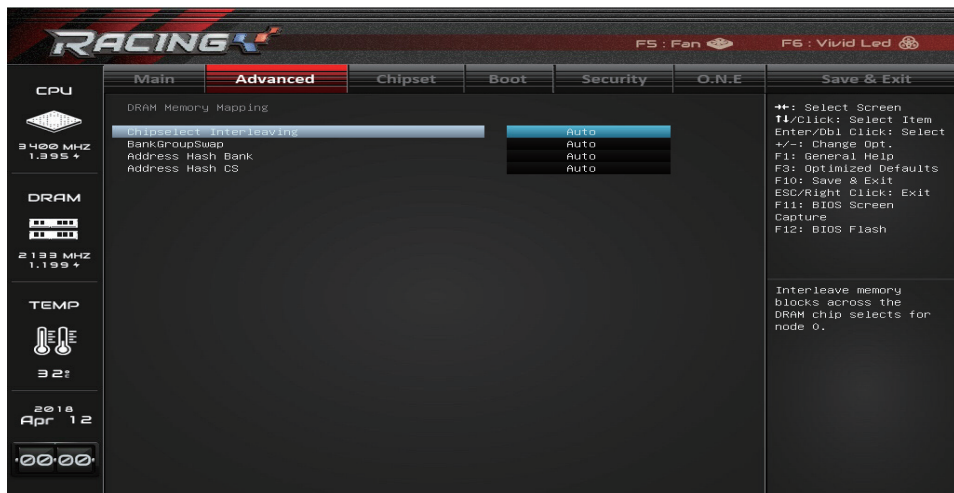
Options: Auto (Default) / Disabled / Enabled

### Data Scramble

This item Data scrambling: DataScrambleEn.

Options: Auto (Default) / Disabled / Enabled

## DRAM Memory Mapping



### Chipselect Interleaving

This item Interleave memory blocks across the DRAM chip selects for node 0.

Options: Auto (Default) / Disabled

### **BankGroupSwap**

This item allows you to set BankGroupSwap.

Options: Auto (Default) / Enabled / Disabled

### **Address Hash Bank**

This item enabled or disabled bank address hashing.

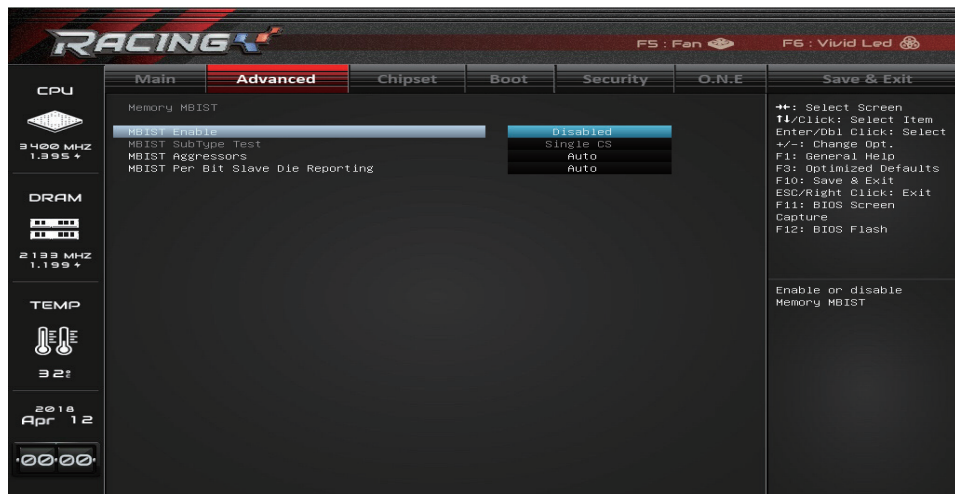
Options: Auto (Default) / Enabled / Disabled

### **Address Hash CS**

This item enabled or disabled CS address hashing.

Options: Auto (Default) / Enabled / Disabled

## **Memory MBIST**



### **MBIST Enable**

This item enables or disables Memory MBIST.

Options: Disabled (Default) / Enabled

### **MBIST SubType Test**

This item select MBIST Subtest - Single Chipselect, Multi Chipselect, Address Line Test or execute All test.

Options: Single CS (Default) / Multiple CS / Connectivity / Data Eye / All Tests

### **MBIST Aggressors**

This item enables or disables MBIST Aggressor test.

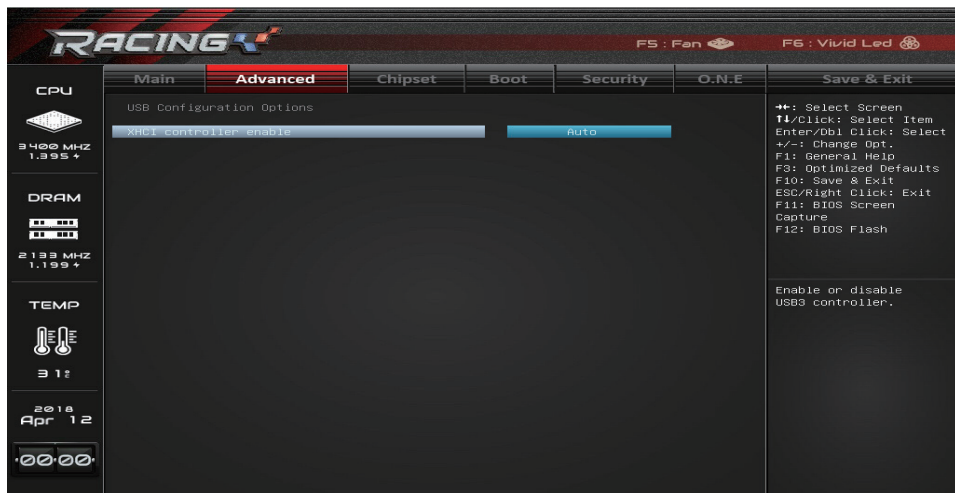
Options: Auto (Default) / Disabled / Enabled

### **MBIST Per Bit Slave Die Reporting**

This item enables or disables MBIST per bit slave die result report.

Options: Auto (Default) / Disabled / Enabled

## FCH Common Options



### XHCI controller enable

This item enabled or disabled USB3 controller.

Options: Auto (Default) / Enabled / Disabled

#### Note

» The following items appear only when you set the XHCI controller enable function to [Enabled].

### XHCI Port 0/1/2/3 PHY Parameter Adjustment

This item allows you to set XHCI Port 0/1/2/3 PHY Parameter Adjustment.

## Trusted Computing



## Security Device Support

This item enables or disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

Options: Enabled (Default) / Disabled

## SHA-1 PCR Bank

This item enables or disables SHA-1 PCR Bank.

Options: Enabled (Default) / Disabled

## SHA256 PCR Bank

This item enables or disables SHA256 PCR Bank.

Options: Enabled (Default) / Disabled

## Pending operation

This item Schedule an Operation for the Security Device.

Options: None (Default) / TPM Clear

» *Your computer will reboot during restart in order to change state of Security Device.*

## Platform Hierarchy

This item enables or disables Platform Hierarchy.

Options: Enabled (Default) / Disabled

## Storage Hierarchy

This item enables or disables Storage Hierarchy.

Options: Enabled (Default) / Disabled

## Endorsement Hierarchy

This item enables or disables Endorsement Hierarchy.

Options: Enabled (Default) / Disabled

## TPM2.0 UEFI Spec Version

This item select the TCG2 Spec Version support. TCG\_1\_2: the Compatible mode for Win8/Win10 ; TCG\_2: Support new TCG2 protocol and event format for Win10 or later.

Options: TCG\_2 (Default) / TCG\_1\_2

## Physical Presence Spec Version

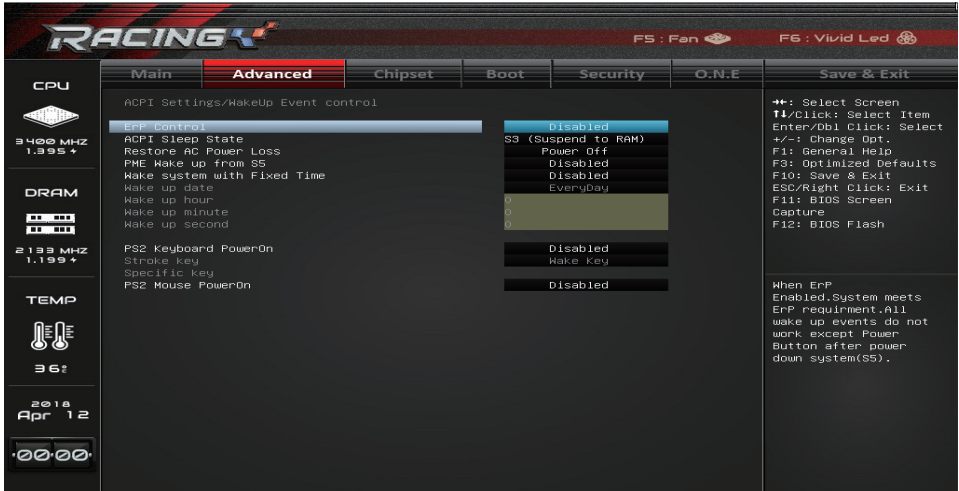
This item select to tell O.S. to support PPI Spec Version 1.2 or 1.3 .

Options: 1.3 (Default) / 1.2

» *Note some HCK tests might not support 1.3 .*



## ACPI Settings/WakeUp Event control



### ErP Control

This item enables or disables ErP Control function. When ErP Enabled, system meets ErP requirement. All wake up events do not work except Power Button after power down system(S5).  
Options: Disabled (Default) / Enabled

### ACPI Sleep State

This item select ACPI sleep state the system will enter when the SUSPEND button is pressed.  
Options: S3 (Suspend to RAM) (Default) / Suspend Disabled

### Restore AC Power Loss

The item 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.

### 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

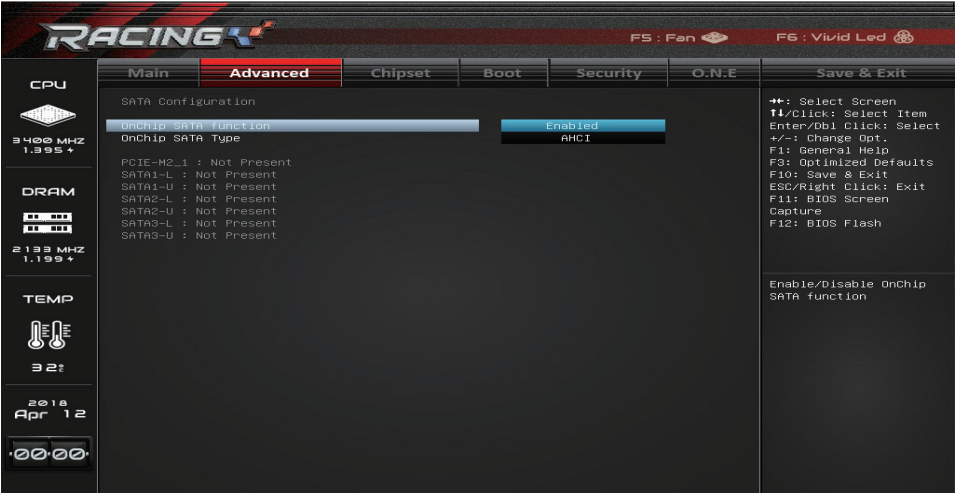
**Specific Key**

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

**SATA Configuration**



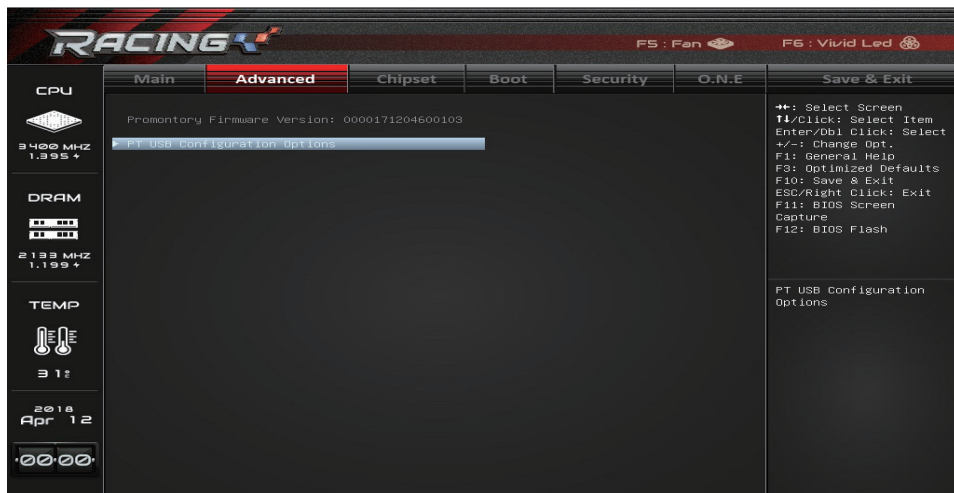
**OnChip SATA function**

This item enables or disables OnChip SATA function.  
Options: Enabled (Default) / Disabled

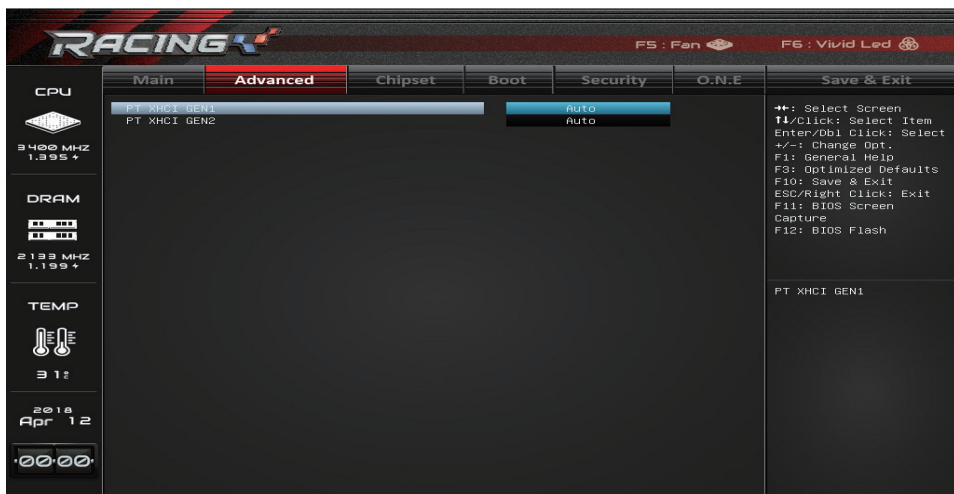
**OnChip SATA Type**

This item select OnChip SATA Type.  
Options: AHCI (Default) / RAID

## Promontory Common Options



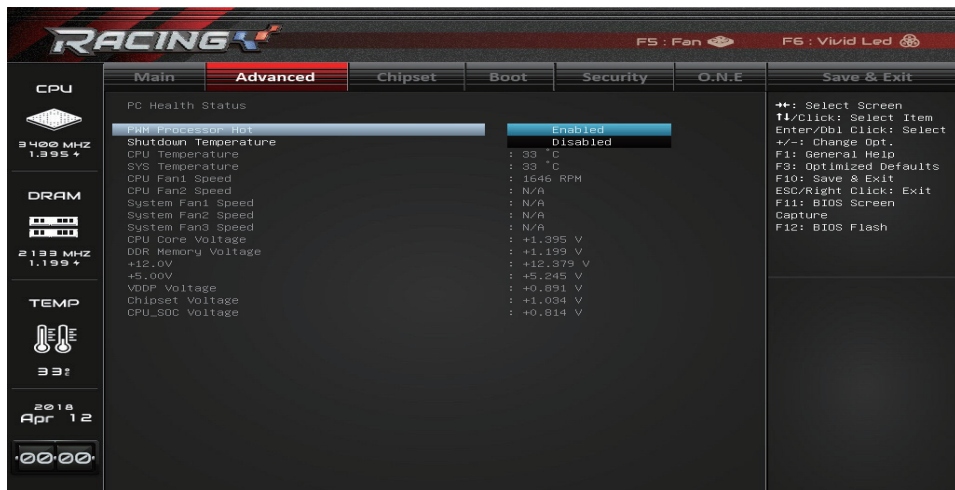
### PT USB Configuration Options



#### PT XHCI GEN1/2

Options: Auto (Default) / Disabled / Enabled

## H/W Monitor



### PWM Processor Hot

Options: Enabled (Default) / Disabled

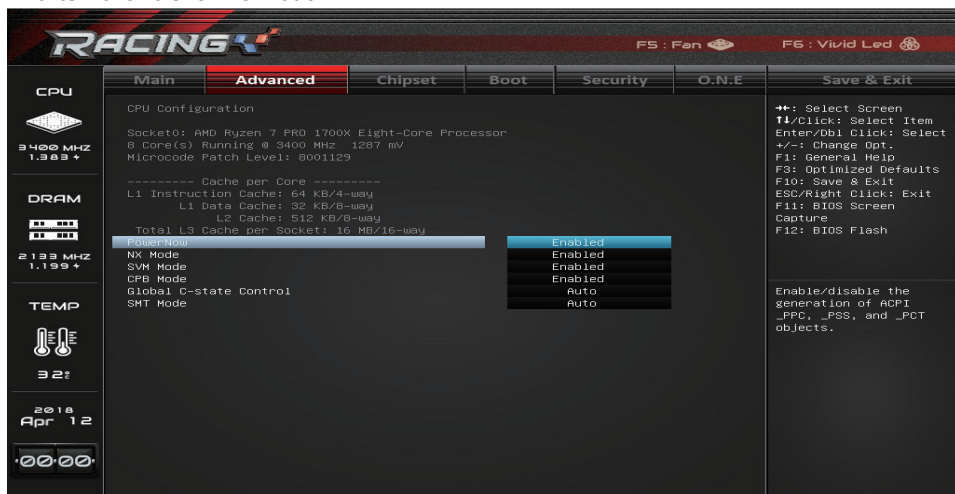
### Shutdown Temperature

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

## CPU Configuration

This item shows CPU Information.



### PowerNow

This item enables or disables the generation of ACPI \_PPC, \_PSS, and \_PCT objects.

Options: Enabled (Default) / Disabled

## NX Mode

This item enables or disables No-execute page protection Function.

Options: Enabled (Default) / Disabled

## SVM Mode

This item enables or disables CPU Virtualization.

Options: Enabled (Default) / Disabled

## CPB Mode

This item specifies the method of core performance boost enablement.

Options: Enabled (Default) / Disabled

## Global C-state Control

This item allows you to controls IO based C-state generation and DF C-states.

Options: Auto (Default) / Disabled / Enabled

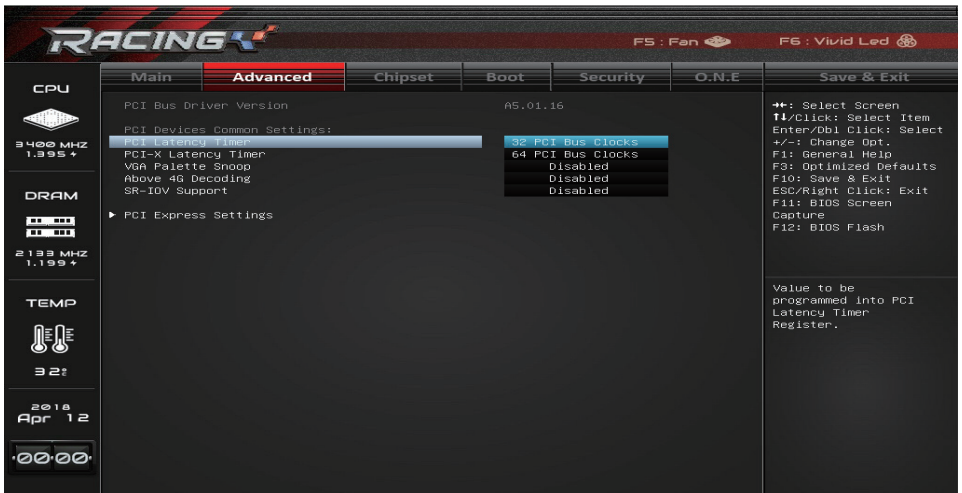
## SMT Mode

This item enables or disables Simultaneous multithreading.

Options: Auto (Default) / Disabled

» *WARNING - S3 is NOT SUPPORTED on systems where SMT is disabled.*

## PCI Subsystem Settings



## PCI Latency Timer

This item value to be programmed into PCI Latency Timer Register.

Options: 32 PCI Bus Clocks (Default) / 64 PCI Bus Clocks / 96 PCI Bus Clocks / 128 PCI Bus Clocks / 160 PCI Bus Clocks / 192 PCI Bus Clocks / 224 PCI Bus Clocks / 248 PCI Bus Clocks

## PCI-X Latency Timer

This item value to be programmed into PCI Latency Timer Register.

Options: 64 PCI Bus Clocks (Default) / 32 PCI Bus Clocks / 96 PCI Bus Clocks / 128 PCI Bus Clocks / 160 PCI Bus Clocks / 192 PCI Bus Clocks / 224 PCI Bus Clocks / 248 PCI Bus Clocks

## VGA Palette Snoop

This item enables or disables VGA Palette Registers Snooping.

Options: Disabled (Default) / Enabled

## Above 4G Decoding

This item enables or disables 64bit capable Devices to be Decoded in Above 4G Address Space (Only if System Supports 64bit PCI Decoding).

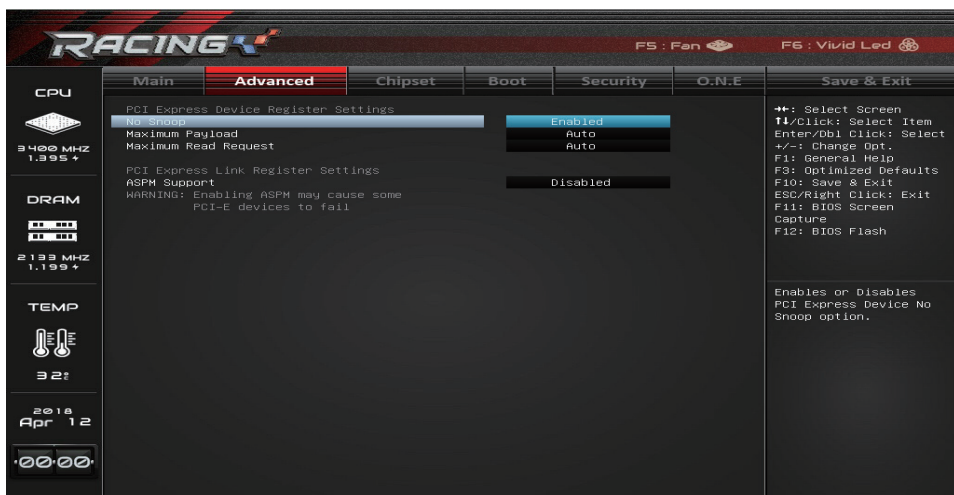
Options: Disabled (Default) / Enabled

## SR-IOV Support

This item if system has SR-IOV capable PCIe Devices, this option enables or disables Single Root IO Virtualization Support.

Options: Disabled (Default) / Enabled

## PCI Express Settings



### No Snoop

This item enables or disables PCI Express Device No Snoop option.

Options: Enabled (Default) / Disabled

### Maximum Payload

This item set Maximum Payload of PCI Express Device or allow System BIOS to select the value.

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

### Maximum Read Request

This item set Maximum Read Request Size of PCI Express Device or allow system BIOS to select the value.

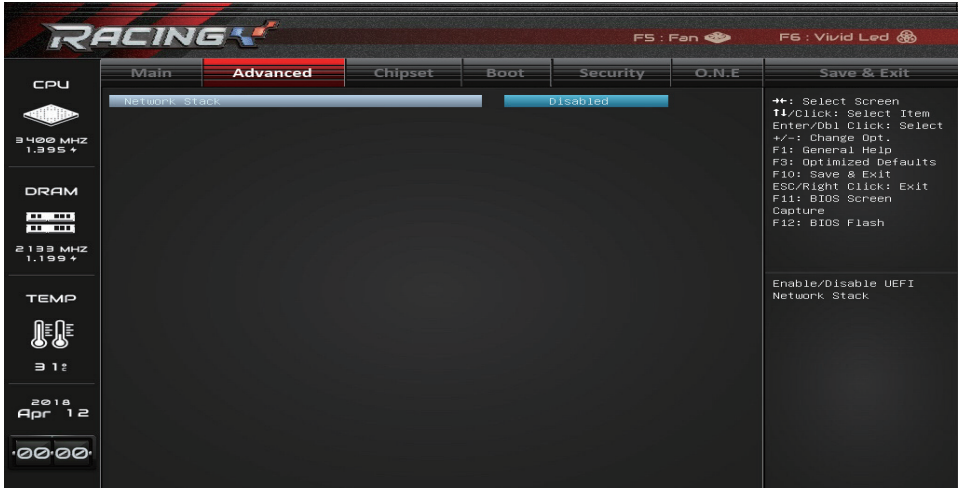
Options: Auto (Default) / 128 Bytes / 256 Bytes / 512 Bytes / 1024 Bytes / 2048 Bytes / 4096 Bytes

### ASPM Support

This item set the ASPM Level: Force L0s - Force all links to L0s State ; AUTO - BIOS auto configure ; Disable - Disable ASPM.

Options: Disabled (Default) / Auto / Force L0s

## 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 support will not be available.

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 support will not be available.

Options: Disabled (Default) / Enabled

#### PXE boot wait time

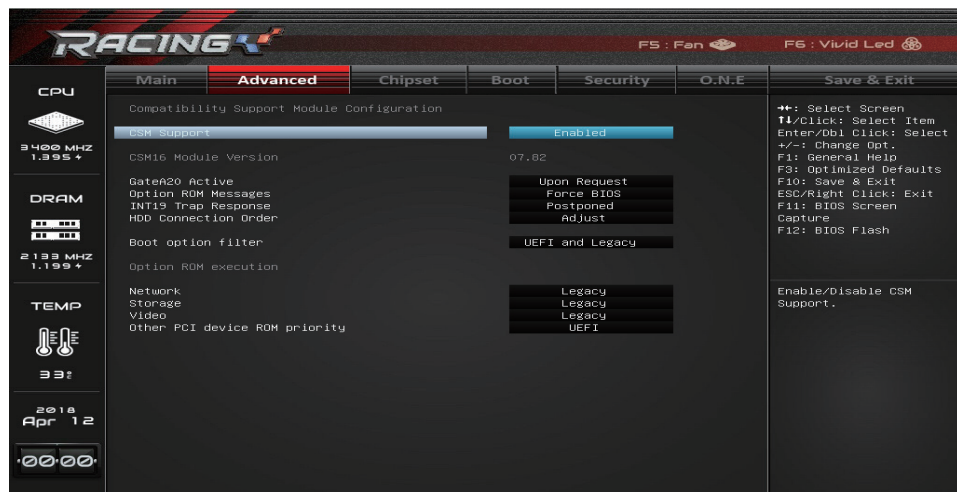
Wait time to press ESC key to abort the PXE boot.

#### Media detect count

Number of times presence of media will be checked.



## CSM Configuration



### CSM Support

This option enables or disables CSM support.

Options: Enabled (Default) / Disabled

### 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 set display mode for Option ROM.

Options: Force BIOS (Default) / Keep Current

### INT19 Trap Response

This item BIOS reaction on INT19 trapping by Option ROM: IMMEDIATE - execute the trap right away ; POSTPONED - execute the trap during legacy boot.

Options: Postponed (Default) / Immediate

### HDD Connection Order

This item some OS require HDD handles to be adjusted, i.e OS is installed on drive 80h.

Options: Adjust (Default) / Keep

### 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 Network 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

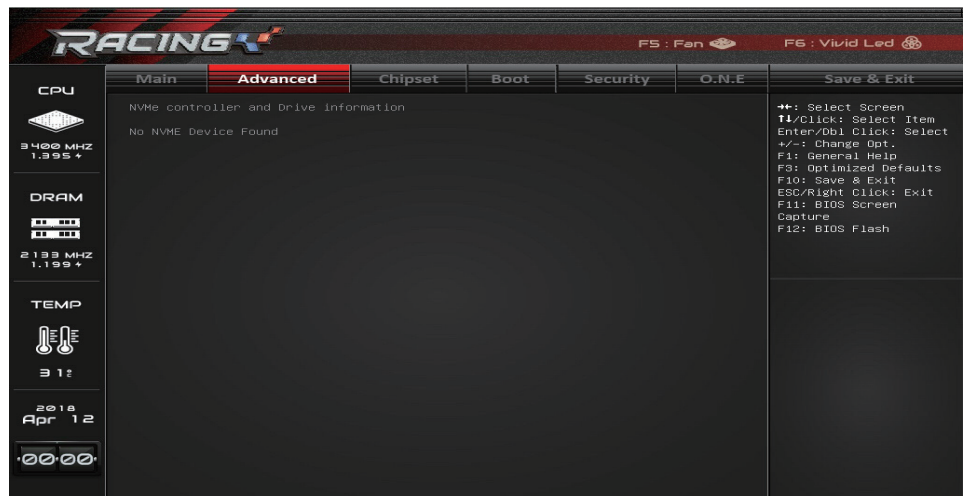
This option controls the execution of UEFI and Legacy Video OpROM  
Options: Legacy (Default) / UEFI / Do not launch

Other PCI device ROM priority

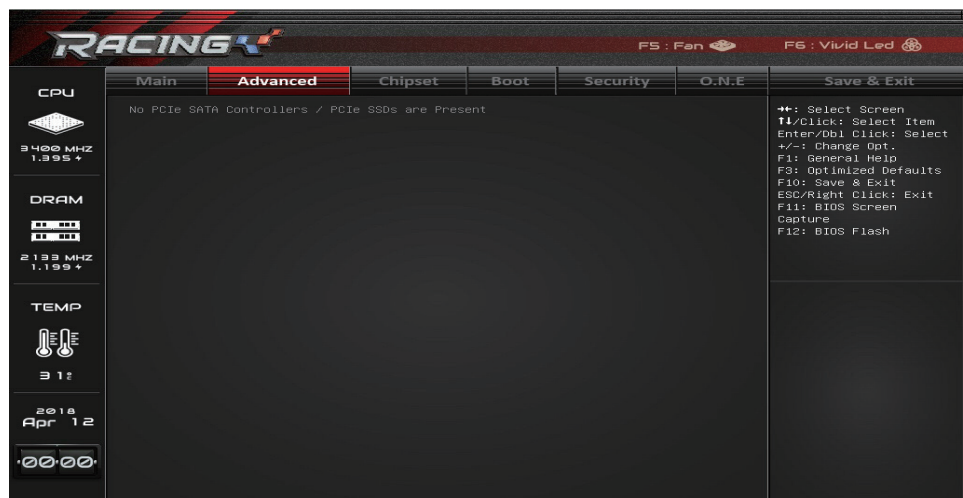
This item for PCI devices other than Network, Mass storage or Video defines which OpROM to launch.  
Options: UEFI (Default) / Legacy / Do not launch

NVMe Configuration

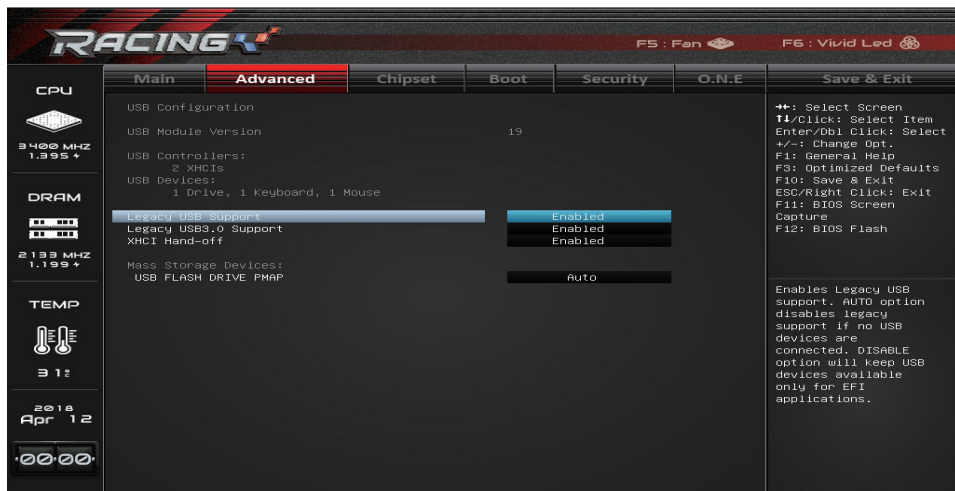
The item shows NVMe controller and driver information.



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

### Legacy USB3.0 Support

The item enables or disables legacy USB3.0 support.  
Options: Enabled (Default) / 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 (Default) / Disabled

### USB FLASH DRIVE PMAP

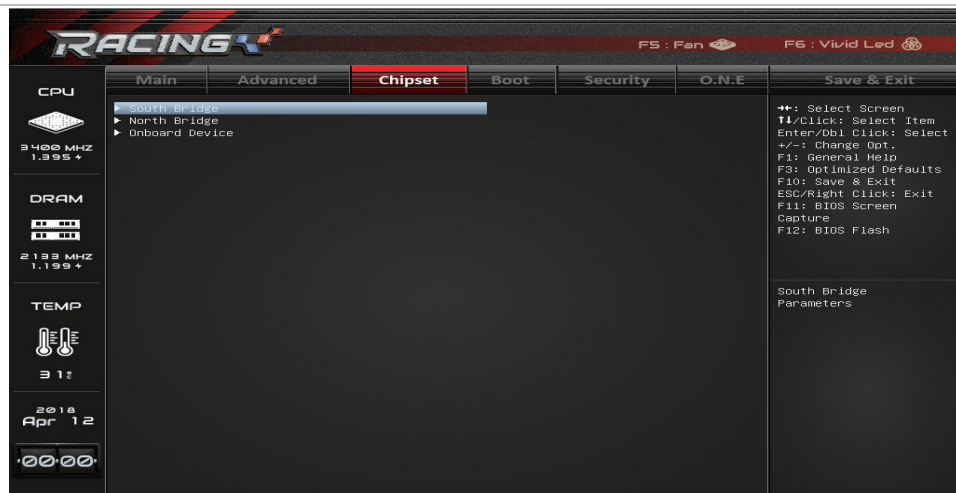
This item Mass storage device emulation type. 'AUTO' enumerates devices according to their media format. Optical drives are emulated as 'CDROM', drives with no media will be emulated according to a drive type.  
Options: Auto (Default) / Floppy / Forced FDD / Hard Disk / CD-ROM

### 3. Chipset Menu

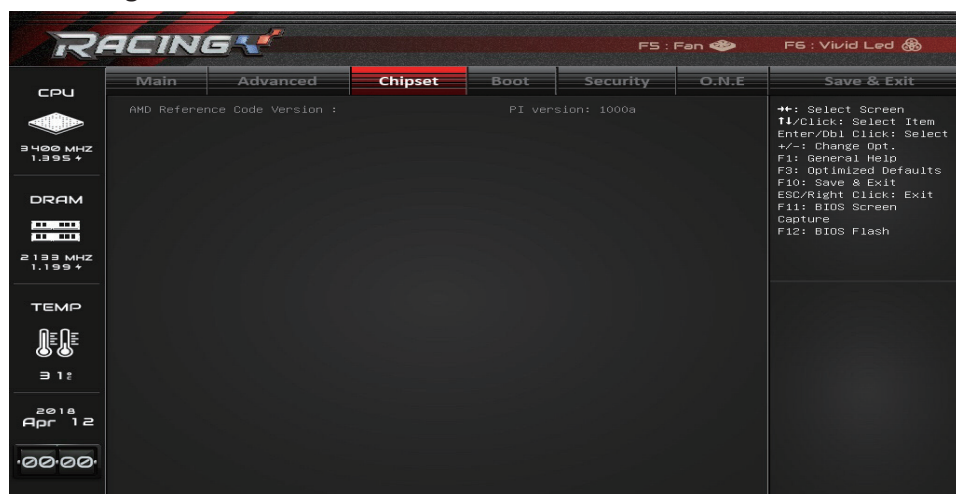
This section describes configuring the PCI bus system. PCI, or Personal Computer Interconnect, is a system which allows I/O devices to operate at speeds nearing the speed of the CPU itself uses when communicating with its own special components.

#### Note

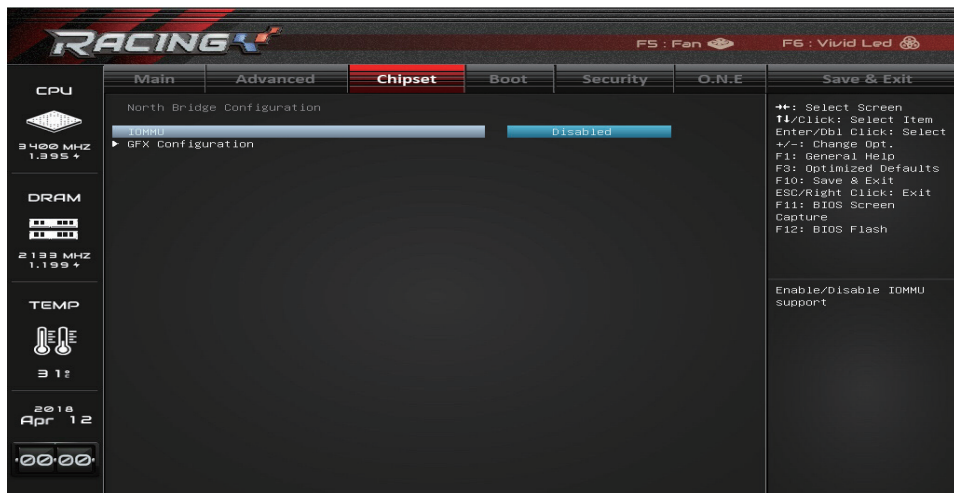
» Beware of that setting inappropriate values in items of this menu may cause system to malfunction.



#### South Bridge



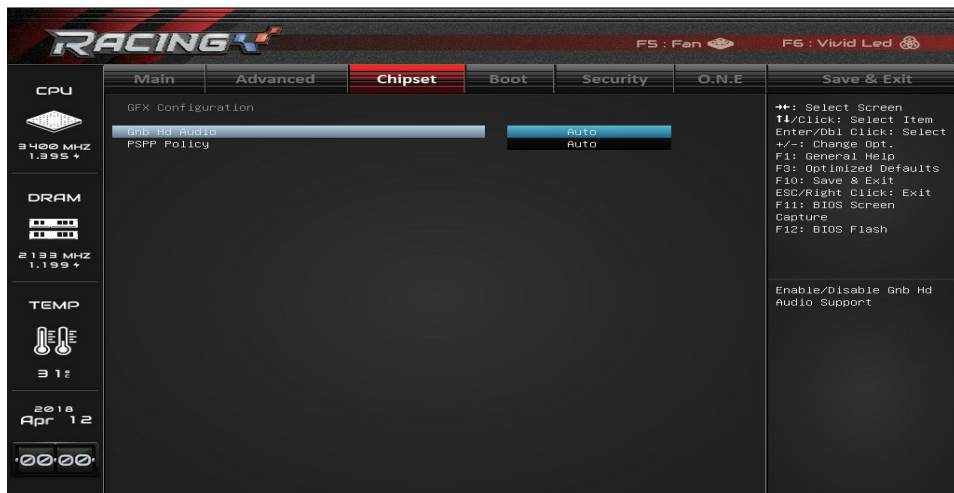
## North Bridge



### IOMMU

This item enables or disables IOMMU support.  
Options: Disabled (Default) / Enabled

### GFX Configuration



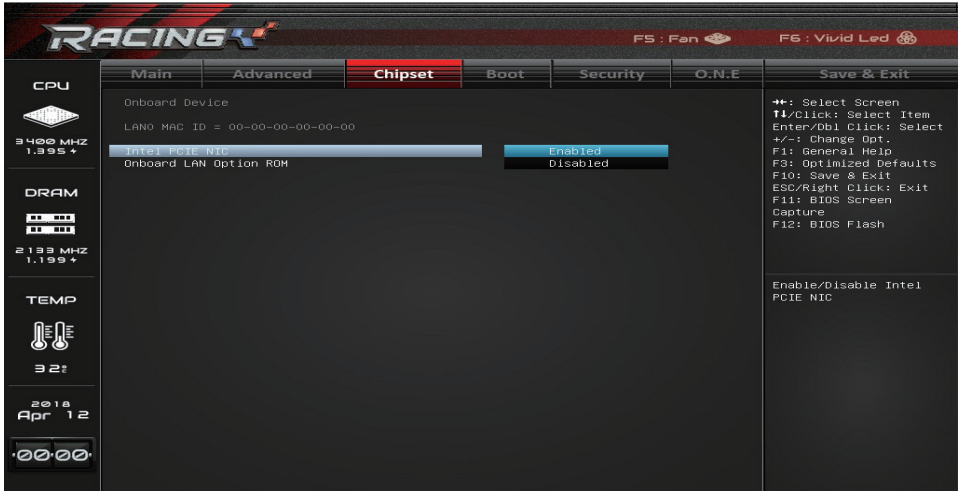
#### Gnb Hd Audio

This item enables or disables Gnb Hd Audio.  
Options: Auto (Default) / Disabled / Enabled

#### PSPP Policy

This item allows you to set PCIe speed power policy.  
Options: Balanced-High (Default) / Disabled / Performance / Balanced-Low / Power Saving / Auto

## Onboard Device



### Intel PCIe NIC

This item enables or disables Intel PCIe NIC.

Options: Enabled (Default) / Disabled

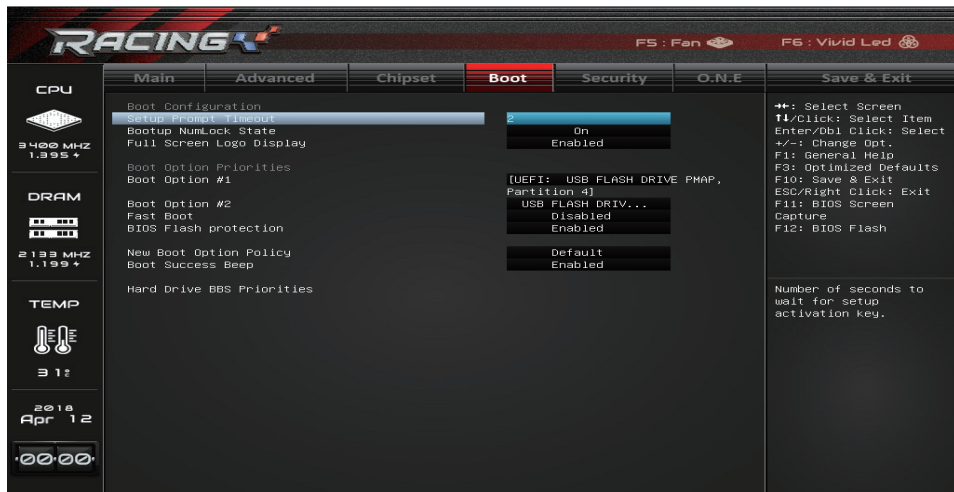
### Onboard LAN Option ROM

This item enables or disables Onboard LAN Option ROM.

Options: Disabled (Default) / Enabled

## 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: 2 (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 or disable Full Screen Logo Show function.

Options: Enabled (Default) / Disabled

### Boot Option #1/ #2

This item allows you to set the system boot order.

### Fast Boot

This item allows you to 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, last boot HDD device will be available in post. If all sata devices, all SATA devices will be available in OS and post.

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

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

**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 Disabled, Redirection function will be disabled.

Options: Disabled (Default) / Enabled

**BIOS Flash protection**

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

Options: Enabled (Default) / Disabled

**New Boot Option Policy**

It controls the placement of newly detected UEFI boot options.

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

**Boot Success Beep**

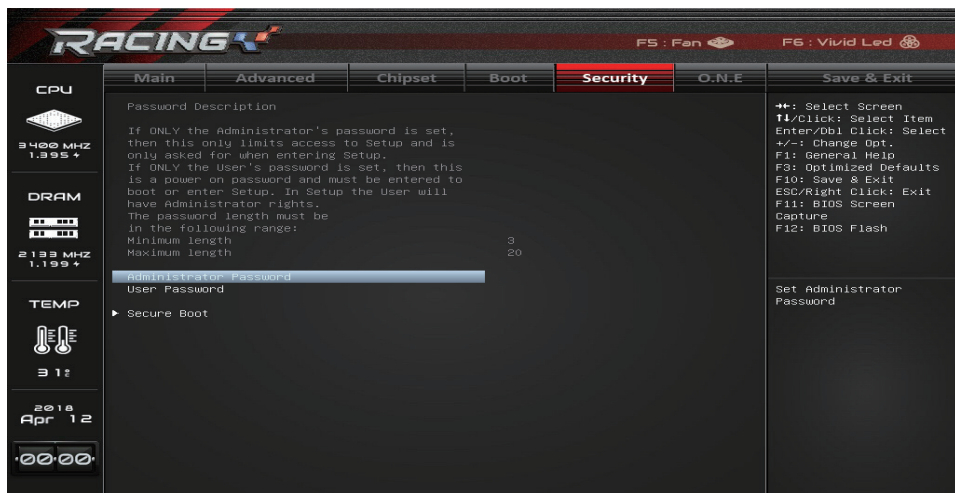
This item BIOS boot post beep message.

Options: Enabled (Default) / Disabled

**Hard Drive BBS Priorities**

This item allows you to set the order of the legacy devices in this group.

## 5. Security Menu



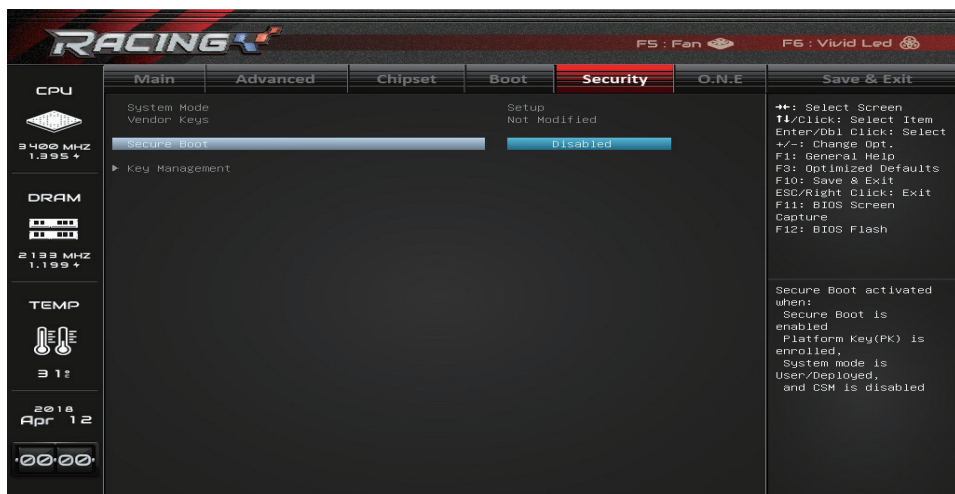
### Administrator Password

This item sets Administrator Password.

### User Password

This item sets User Password.

### Secure Boot Menu





## 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

## Key Management



### Restore Factory keys

Force System to User Mode - install all Factory Default Keys. Change takes effect after reboot.

### Reset To Setup Mode

Delete NVRAM content of all UEFI Secure Boot key databases.

### Platform Key (PK)

Options: Details / Export / Update / Delete

### Key Exchange Keys

Options: Details / Export / Update / Append / Delete

### Authorized Signatures

Options: Details / Export / Update / Append / Delete

### Forbidden Signatures

Options: Details / Export / Update / Append / Delete

### Authorized TimeStamps

Options: Update / Append

### OsRecovery Signatures

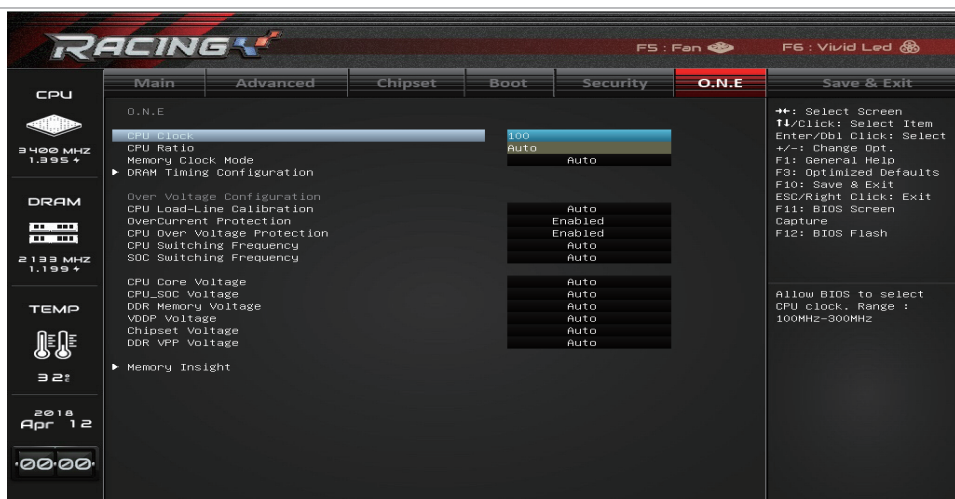
Options: Update / Append

## 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



### CPU Clock

This item allows you to select CPU clock. Range: 100MHz - 300MHz  
Options: 100 (Default)

### CPU Ratio

This item allows you to set the CPU Ratio.  
Options: Auto (Default)

### Memory Clock Mode

This item allows you to select the Memory Clock Mode. If Auto, the DRAM speed will be based on SPDs. If Manual, the DRAM speed specified will be programmed regardless of SPD.  
Options: Auto (Default) / Manual

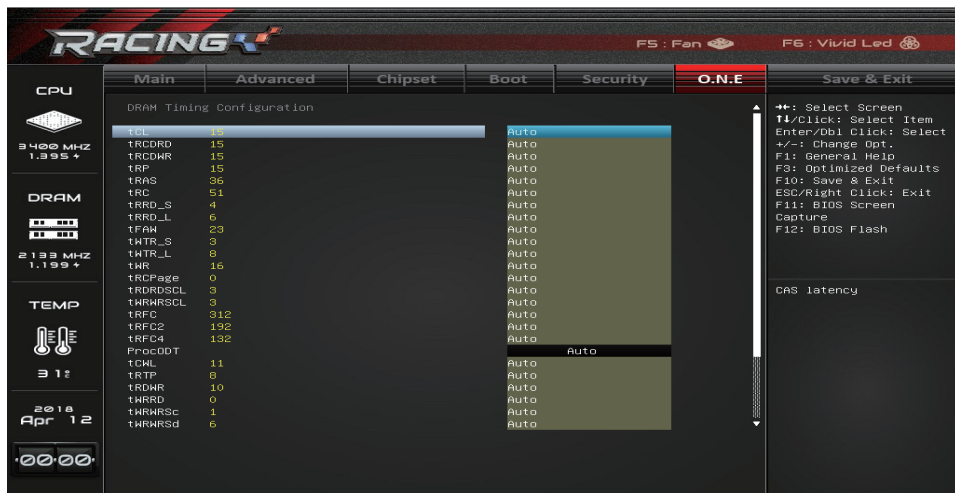
### Note

- » The following items appear only when you set the Memory Clock Mode function to [Manual]

### Memory Frequency

This item select the memory clock value in MHz.  
Options: Auto (Default)

## DRAM Timing Configuration



### tCL

This item allows you to select CAS Latency.

Options: Auto (Default)

### tRCRDRD

This item allows you to select RAS to CAS delay.

Options: Auto (Default)

### tRCRDRW

This item allows you to select RAS to CAS R/W delay.

Options: Auto (Default)

### tRP

This item allows you to select Row Precharge Time.

Options: Auto (Default)

### tRAS

This item allows you to select ROW Active Strobe.

Options: Auto (Default)

### tRC

This item allows you to select ROW Cycle Time.

Options: Auto (Default)

### tRRD\_S

This item allows you to select Activate to Activate Delay Time, different bank group.

Options: Auto (Default)

### tRRD\_L

This item allows you to select Activate to Activate Delay Time, same bank group.

Options: Auto (Default)

**tFAW**

This item allows you to select Specify Tfw.

Options: Auto (Default)

**tWTR\_S**

This item allows you to select Min Internal Write to Read Time, different bank group.

Options: Auto (Default)

**tWTR\_L**

This item allows you to select Min Internal Write to Read Time, same bank group.

Options: Auto (Default)

**tWR**

This item allows you to select Min Write Recovery.

Options: Auto (Default)

**tRCPage**

This item allows you to select Specify tRCPage.

Options: Auto (Default)

**tRDRDSCl**

This item allows you to select CAS to CAS Delay Time, same bank group.

Options: Auto (Default)

**tWRWRSCl**

This item allows you to select CAS to CAS Delay Time, same bank group.

Options: Auto (Default)

**tRFC**

This item allows you to select auto refresh row cycle time.

Options: Auto (Default)

**tRFC2**

This item allows you to select auto refresh row cycle time.

Options: Auto (Default)

**tRFC4**

This item allows you to select auto refresh row cycle time.

Options: Auto (Default)

**ProcODT**

This item allows you to select Specifies the ProCESSOR ODT.

Options: Auto (Default) / High Impedance / 480 ohm / 240 ohm / 160 ohm / 120 ohm / 96 ohm / 80 ohm / 68.6 ohm / 60 ohm / 53.3 ohm / 48 ohm / 43.6 ohm / 40 ohm / 36.9 ohm / 34.3 ohm / 32 ohm / 30 ohm

**tCWL**

This item allows you to select tCWL,  $tCWL = \text{DRAM CWL} + \text{PL} + \text{RCD nLadd}$ .

Options: Auto (Default)

**tRTP**

This item allows you to select Read CAS to precharge time.

Options: Auto (Default)

**tRDWR**

This item allows you to set the tWRTTO time.

Options: Auto (Default)

**tWRRD**

This item allows you to select specify the write to read delay when different DIMMs.

Options: Auto (Default)

**tWRWRSc**

This item allows you to select write to write timing same DIMM same chip.

Options: Auto (Default)

**tWRWRSd**

This item allows you to select write to write timing same DIMM same chip.

Options: Auto (Default)

**tWRWRDd**

This item allows you to select write to write timing same DIMM same chip.

Options: Auto (Default)

**tRDRDSc**

This item allows you to select write to write timing same DIMM same chip.

Options: Auto (Default)

**tRDRDSd**

This item allows you to select write to write timing same DIMM same chip.

Options: Auto (Default)

**tCKE**

This item allows you to select CKE min high and low pulse width in emeory clock cycles.

Options: Auto (Default)

**Cmd2T**

This item allows you to select between 1T and 2T mode on ADDR/Cmd.

Options: Auto (Default) / 1T / 2T

**Power Down**

This item enables or disables DDR power down mode.

Options: Auto (Default) / Enabled / Disabled

**Gear Down**

This item allows you to select specifies DDR4 Gear Down Mode.

Options: Auto (Default) / Enabled / Disabled

**CPU Load-Line Calibaration**

This item adjust CPU LLC function.

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

**OverCurrent Protection**

This item enables or disables OverCurrent Protection (OCP).

Options: Enabled (Default) / Disabled

## CPU Over Voltage Protection

This item enables or disables CPU Over Voltage Protection.

Options: Enabled (Default) / Disabled

## CPU Switching Frequency

This item allows you to set up the CPU Switching Frequency.

Options: Auto (Default) / 300.0 KHz / 350.0 KHz / 400.0 KHz / 450.0 KHz / 500.0 KHz

## SOC Switching Frequency

This item allows you to set up the SOC Switching Frequency.

Options: Auto (Default) / 250.0 KHz / 300.0 KHz / 350.0 KHz / 400.0 KHz / 450.0 KHz

## CPU Core Voltage

This item allows you to control CPU Core Voltage Control.

Options: Auto (Default) / Override / Adaptive

---

### Note

» The following items appear only when you set the CPU Core Voltage function to [Override]

---

### CPU Vcore Adjust Voltage

Options: Auto (Default), Range: 1.000V-2.1000V

---

### Note

» The following items appear only when you set the CPU Core Voltage function to [Adaptive]

---

### CPU Core Offset Prefix

Options: + (Default) / -

### CPU Core Offset Voltage

Options: Auto (Default), Range: 0V-0.635V

## CPU\_SOC Voltage

This item allows you to control CPU\_SOC Voltage Control.

Options: Auto (Default) / Override / Adaptive

---

### Note

» The following items appear only when you set the CPU\_SOC Voltage function to [Override]

---

### CPU\_SOC Adjust Voltage

Options: 0.950V (Default), Range: 0.900V-1.500V

---

### Note

» The following items appear only when you set the CPU\_SOC Voltage function to [Adaptive]

---

### CPU\_SOC Offset Prefix

Options: + (Default) / -

### CPU\_SOC Offset Voltage

Options: Auto (Default), Range: 0V-0.635V

## DDR Memory Voltage

This item allows you to control DDR Memory Voltage.

Options: Auto (Default)

## VDDP Voltage

This item allows you to control VDDP Voltage.

Options: Auto (Default)

## Chipset Voltage

This item allows you to control Chipset Voltage.

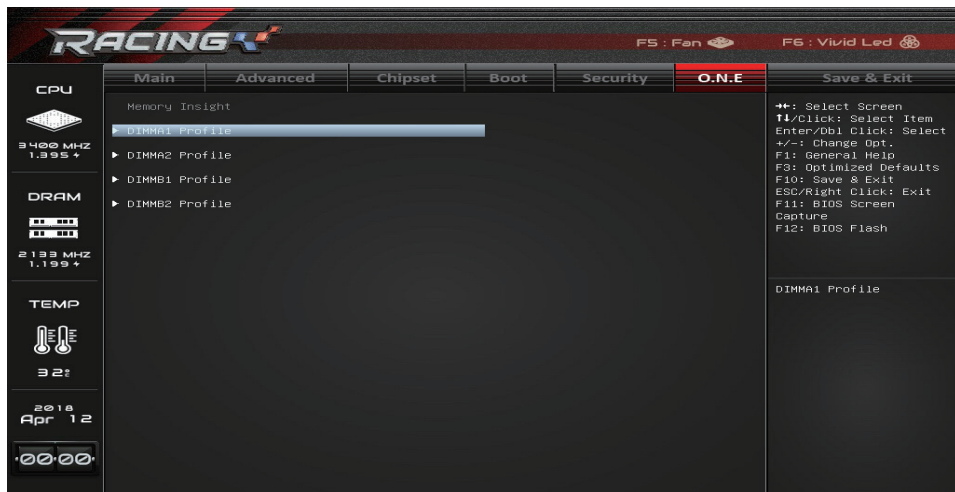
Options: Auto (Default)

## DDR VPP Voltage

This item allows you to control DDR VPP Voltage.

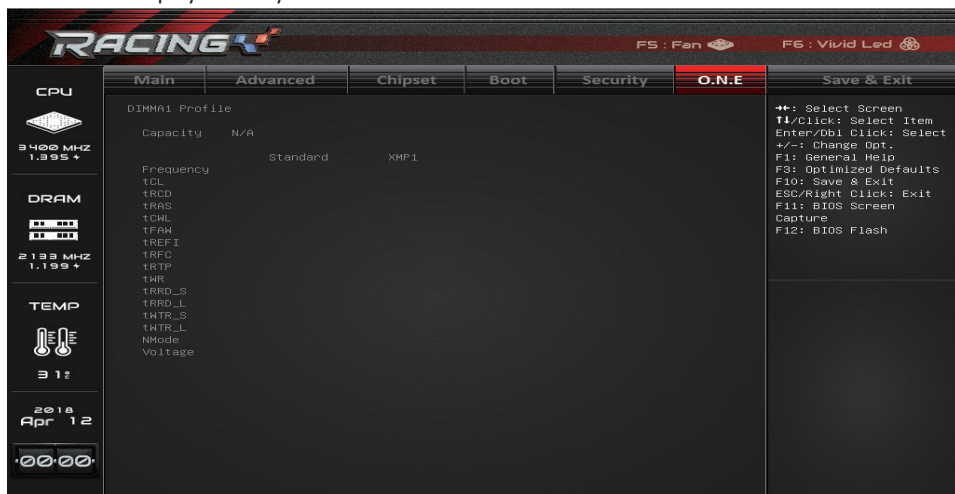
Options: Auto (Default)

## Memory Insight



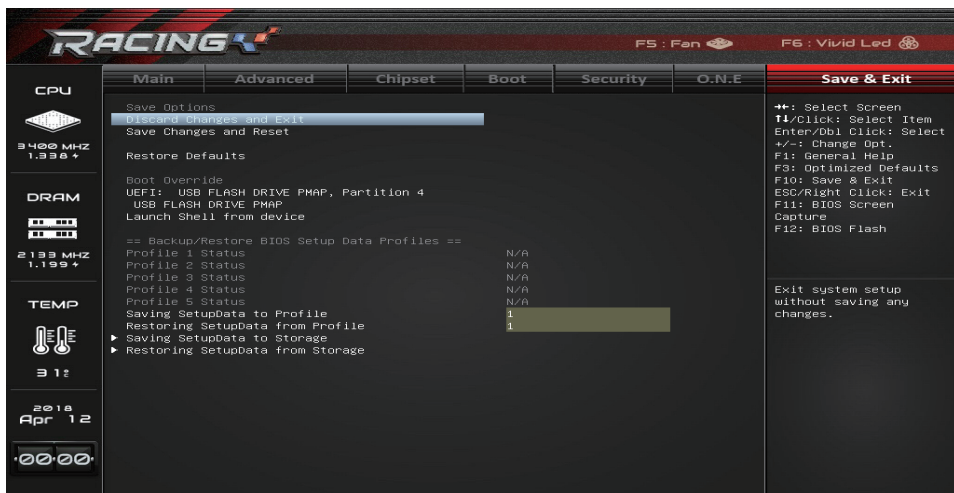
## DIMMA1 Profile

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

Restore/Load Default values for all the setup options.

### Launch EFI Shell from filesystem device

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

### Saving SetupData to Profile

This item Saving SetupData to Profile.

Options: 1

### Restoring SetupData from Profile

This item Restoring SetupData from Profile.

Options: 1

### Saving SetupData to Storage

This item saves your current BIOS Setup Data to storage devices.

### Restoring SetupData from Storage

This item restores your BIOS Setup Data from storage devices.