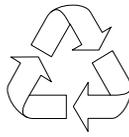


Predator Orion X-650

Desktop Computer Service Guide



100% Recycled Paper

Service guide files and updates are available on the
Acer/CSD web site; for more information, go to
http://gcsd.acer.com.tw/GCSD_Portal/

Revision History

Refer to the table below for changes made on this version of the Predator Orion X-650 Desktop Computer Service Guide.

Date	Version	Chapter	Updates
08-09-2023	First Draft		
08-11-2023	V1.00		
09-26-2023	V1.01	3	Updated the System Assembly and Disassembly information.
04-09-2024	V1.02	3	Page 53 - Added adhesive tape removal step in "Removing the PCIe x16 Extension Cable" . Page 83 - Added adhesive tape installation step in "Reinstalling the PCIe x16 Extension Cable" .

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Conventions

The following textual conventions are used in this service guide.

SCREEN MESSAGES	Denotes actual messages that appear on screen.
NOTE	Gives additional information related to the current topic.
WARNING	Alerts you to any physical risk or system damage that might result from doing or not doing specific actions.
CAUTION	Gives precautionary measures to avoid possible hardware or software problems.
IMPORTANT	Reminds you to do specific actions relevant to the accomplishment of procedures.

Service Guide Coverage

This Service Guide provides you with all technical information relating to the BASIC CONFIGURATION decided for our global product offering. To better fit local market requirements and enhance product competitiveness, your regional office MAY have decided to extend the functionality of a machine (e.g. add-on card, modem, or extra memory capability). These LOCALIZED FEATURES will NOT be covered in this generic service guide. In such cases, please contact your regional offices or the responsible personnel/channel to provide you with further technical details.

FRU Information

Please note WHEN ORDERING FRU PARTS, that you should check the most up-to-date information available on your regional web or channel. If, for whatever reason, a part number change is made, it will not be noted in the printed service guide. For AUTHORIZED SERVICE PROVIDERS, your office may have a DIFFERENT part number code to those given in the FRU list of this printed service guide. You MUST use the list provided by your regional Acer office to order FRU parts for repair and service of customer machines.

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Features and Specifications

This chapter lists the features and specifications of the Predator Orion X-650 Desktop Computer.

NOTE The items listed in this section are for reference only. The exact configuration of your PC depends on the model purchased.

System Features

Component	Description
Operating system support	<ul style="list-style-type: none"> • Microsoft Windows 11 ML x64 • Microsoft Windows 11 SL x64 • Microsoft Windows 11 CN x64 • UEFI Shell
Processor	<ul style="list-style-type: none"> • Socket LGA1700 • Supports the following Intel Raptor Lake-S processors: <ul style="list-style-type: none"> – Intel Core i7 13700 2.1G 25M 4800/6000 8+8Cores 65W – Intel Core i7 13700F 2.1G 25M 4800/6000 8+8Cores 65W – Intel Core i5 13400 2.5G 18M 4800/6000 6+4Cores 65W – Intel Core i5 13400F 2.5G 18M 4800/6000 6+4Cores 65W
Chipset	PCH: Intel H770
Graphics controller	One PCIe x16 graphics card (nVidia RTX 4080 / nVidia RTX4070Ti)
Hardware monitor	EC I/O
Memory	Support DDR5 1.1V 4800 or DDRV 1.35V 6000 U-DIMMs (8GB/16GB) dual channel up to 32GB total memory
Expansion options	<ul style="list-style-type: none"> • One PCI Express x16 slot (reserved for GPU card installation) • Three M.2 slots
Display	No on-board graphics controller
Audio	Realtek ALC897 5.1 Channel High Definition Audio Codec
I/O ports	<ul style="list-style-type: none"> • Front panel <ul style="list-style-type: none"> – One USB 3.2 Gen1 Type A port – One USB 3.2 Gen1 Type C port – One headset combo jack (does not support microphone only device) – One Microphone jack • Rear panel <ul style="list-style-type: none"> – One USB 3.2 Gen2x2 Type C port – One USB 3.2 Gen2 Type A port – One USB 3.2 Gen1 Type A port – Two USB 2.0 ports – One Ethernet jack (RJ45) – One Microphone jack – One line-out jack – One line-in jack
LED display and buttons	<ul style="list-style-type: none"> • Power LED • Power button

Component	Description
Hard disk drive (HDD)	<ul style="list-style-type: none"> Two HDD bays supporting 2.5-inch SATA HDDs Support 5400 rpm SATA HDD in 1TB capacity
Solid state drive (SSD)	<ul style="list-style-type: none"> Two M.2 slots supporting Solid State Drives (SSD) Support SSD in 512GB/1024GB capacities
Connectivity	<ul style="list-style-type: none"> Wired LAN: Onboard 10/100/1000 Ethernet (Killer E3100G) WLAN option: Intel Garfield Peak Wireless LAN+BT (802.11 ax)
Power supply	FR 850W power supply unit (Active PFC)
Security	<ul style="list-style-type: none"> Firmware Trusted Platform Module (fTPM) BIOS-based user and supervisor passwords Kensington lock
System BIOS	<ul style="list-style-type: none"> AMI BIOS with 32 MB SPI Flash ROM Supports ACPI revision 6.2 standard Supports Plug and Play, STR(S3)/STD(S4), hardware monitor, Multi Boot, and DMI protocols

Physical Specifications

Aspect	Description
Chassis dimension (W x H x D)	389.8mm x 179mm x 292mm (15.35in x 7.05in x 11.5in)
System weight	10.05kg (19.224lb)
Mainboard form factor	Mini ITX
Mainboard dimensions (W x H)	170mm*170mm, 10 Layers

Environmental Requirements

Temperature

Item	Description
Operating	5 to 35 °C (41 to 95 °F)
Non-operating	Packed: -20 to 60 °C (-4 to 140 °F) Unpacked: -10 to 60 °C (14 to 140 °F)

Humidity

Item	Description
Operating	15% to 80% RH non-condensing
Non-operating	10% to 90% RH non-condensing at 40 °C

System Tour

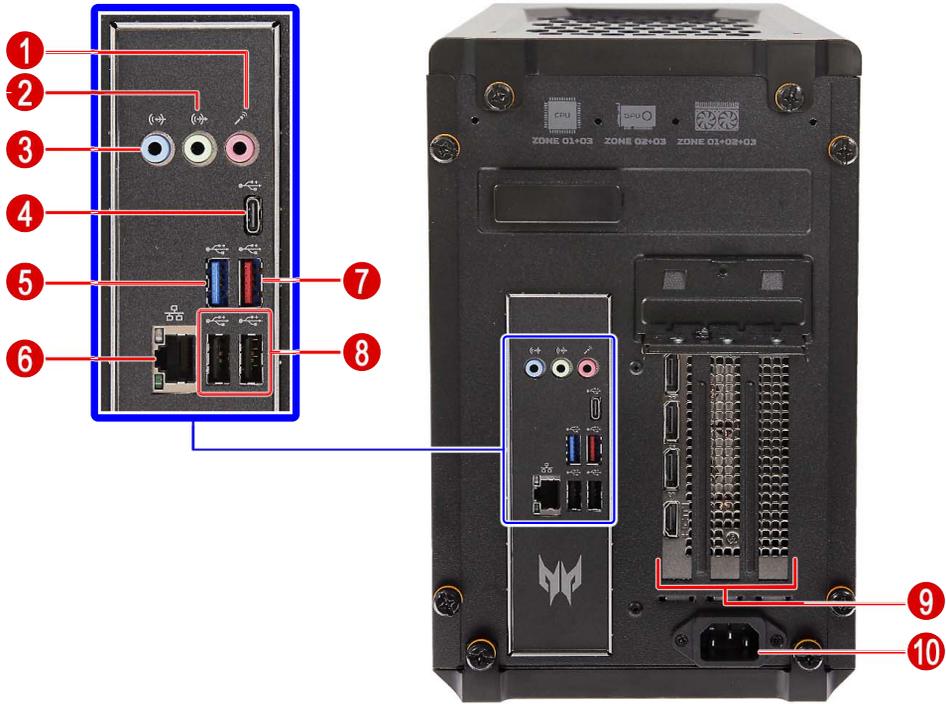
The pictures and tables in this section illustrate the physical outlook of the computer.

Front View



Item	Component
1	Zone 3 Release Latch
2	Zone 2 Release Latch
3	Zone 1 Release Latch
4	Power button/LED
5	Portable SSD Device
6	USB 3.2 Gen1 Type A port
7	Headset combo jack (does not support microphone only device)
8	Microphone jack
9	USB 3.2 Gen1 Type C port

Rear View



Item	Component
1	Microphone jack
2	Line-out jack
3	Line-in jack
4	USB 3.2 Gen2x2 Type C port
5	USB 3.2 Gen1 Type A port
6	LAN connector
7	USB 3.2 Gen2 Type A port
8	USB 2.0 ports
9	Graphics card
10	Power connector

Hardware Specifications

Processor

Item	Specification
Socket	Socket LGA1700
Package type	14 nm
CPU type	Supports the following Raptor Lake-S processors: <ul style="list-style-type: none">– Intel Core i7 13700 2.1G 25M 4800/6000 8+8Cores 65W– Intel Core i7 13700F 2.1G 25M 4800/6000 8+8Cores 65W– Intel Core i5 13400 2.5G 18M 4800/6000 6+4Cores 65W– Intel Core i5 13400F 2.5G 18M 4800/6000 6+4Cores 65W

Chipset

Item	Specification
System chipset	PCH: Intel H770
Hardware monitor	ECIO ITE8637

Memory

Item	Specification
Controller	Integrated in the Intel Raptor Lake-S processors
Number of DIMM slot	2
Maximum memory	32GB (using two 16GB modules)
Data rate	4800 / 6000 MT/s
DIMM type	DDR5 1.1V / 1.35V U-DIMMs
Supported capacities	8GB, 16GB
Vendor and models	<ul style="list-style-type: none">• A-DATA – 8GB AO2V48UC8W1-BHLS / 16GB AO2Y60UCSV1-BHZS• KINGSTON – 16GB ACR48U40BS8MA-16F
Population rule	Please refer to “Reinstalling the Memory Modules” on page 100 for Memory Population Matrix Table.

Hard Disk Drive

Item	Specification
Controller	Integrated in the Intel H770 chipset
Number of HDD bays	2
Form factor	2.5-inch
Interface	SATA 3.0
Supported capacities	1TB
Vendor and models	Western Digital – 1TB WD10SPZX-21Z10T0

Solid State Drive (SSD)

Item	Specification
Controller	Integrated in the Intel H770 chipset / Raptor Lake-S processors
Number of SSD bays	2
Form factor	M.2 2280
Interface	PCIe V4.0
Supported capacities	512GB, 1024GB
Vendor and models	<ul style="list-style-type: none">• Hynix – 1TB HFS001TEJ9X110N• Micron – 512GB MTFDKBA512TFK-1BC15ABYY / 1TB MTFDKBA1T0TFK-1BC15ABYY• Western Digital – 512GB SN740 SDDQNQD-512G-1014

Audio

Item	Specification
Controller	Realtek ALC897 5.1 Channel High Definition Audio Codec
Connectors	Three audio jacks

Ethernet

Item	Specification
Controller	Killer E3100G
LAN protocol	10/100/1000 Mbps
LAN connector type	RJ-45

Wireless LAN

Item	Specification
WLAN module	<ul style="list-style-type: none">• Intel AX211 Garfield Peak WLAN AX + BT• Killer 1675i WLAN AX + BT• Killer 1690i WLAN AX + BT
Form factor	M.2 2230
Interface	PCIe V3.0
Protocol	WLAN M.2 2X2 AX + BT 5.2

SATA Interface

Item	Specification
SATA Controller	Integrated in the Intel H770 chipset
Connectors	Two SATA 3.0 ports

PCIe Interface

Item	Specification
Controller	<ul style="list-style-type: none">Integrated in the Intel Raptor Lake-S processors (PCIe x16 / M.2 SSD)Integrated in the Intel H770 chipset (M.2 SSD / WLAN)
Connectors	<ul style="list-style-type: none">One PCI Express x16 slot (PCIe V5.0)One M.2 2230 WLAN+BT slot (PCIe V3.0)One M.2 2280 SSD slot (PCIe V4.0)One M.2 2280 SSD connector (PCIe V4.0)

Keyboard and Input Devices

Item	Specification
Controller	ECIO ITE8637
Connectors	Seven USB ports (two in front and five on rear)

Power Supply Unit

Item	Specification
Type	FR 850W power supply unit (Active PFC)
Input	100-240V
Output (max.)	850W
Vendor and models	FSP FSP850-57SBB 850W Active PFC SFX

System Utilities

This chapter lists the system utilities installed in Predator Orion X-650 Desktop Computer.

CMOS Setup Utility

CMOS Setup Utility is a hardware configuration program built into the system ROM. Since most systems are already properly configured and optimized, there is normally no need to run this utility.

You will need to run this utility under the following conditions:

- When changing the system configuration including:
 - Setting the system time and date
 - Configuring the system drives and peripherals
 - Specifying the boot device sequence
 - Configuring the power management modes
 - Setting up system passwords or making other changes to the security setup
- When trying to resolve IRQ conflicts
- When a configuration error is detected by the system and you are prompted (**Run Setup** message) to make changes to the BIOS settings.

The Setup Utility loads the configuration values in a battery-backed nonvolatile memory called CMOS RAM. This memory area is not part of the system RAM, which allows configuration data to be retained when power is turned off. The values take effect when the system is booted. POST uses these values to configure the hardware. If the values and the actual hardware do not agree, POST generates an error message. You must run this utility to change the hardware settings from the default or current configuration.

IMPORTANT If you repeatedly receive “**Run Setup**” messages, the RTC battery located on the mainboard (BT1) may be defective. In this case, the system cannot retain configuration values in CMOS. Replace the RTC battery with a new one.

NOTE For ease of reading, CMOS Setup Utility will be simply referred to as “Setup” or “Setup Utility” in this Service Guide.

Accessing the Setup Utility

1. Turn on the computer.

If the computer is already turned on, save your data and close all open applications, then restart the computer.

2. During POST, press **Delete**.

If you fail to press **Delete** before POST is completed, you will need to restart the computer.



Press **F1** to access the **Advanced Settings** Menu.

Use the **Left/Right/Up/Down** arrow keys to move between the menu screens, then press **Enter** to view that menu tab.

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

Some options (marked with a ►) lead to submenus that enable you to change the values for the option. Use the **Up/Down/Left/Right** arrow keys to scroll through the items in the submenu

Navigating through the Setup Utility

Use the keys listed in the legend bar on the bottom of the Setup screen to work your way through the various menu and submenu screens of the Setup Utility. The table below lists these legend keys and their respective functions.

Key	Function
Left	Go back to Main Menu.
Up/Down arrow keys	Move the cursor to the item you want. The currently selected field will be highlighted.
Enter/Right arrow key	<ul style="list-style-type: none">• To open the page for the currently selected menu/submenu• To apply a field value.
+ / - / space bar	To select a value for the currently selected field (only if it is user-configurable). Press these keys repeatedly to display all possible entries. A parameter that is enclosed in square brackets [] is user-configurable. Black font parameters are not user-configurable for one of the following reasons: <ul style="list-style-type: none">• The field value is auto-configured or auto-detected.• The field value is informational only.• The field is password-protected.
F1	Toggle between Ez Mode and Advanced Settings
F9	Press to load default system values.
F10	Press to save changes and close the Setup Utility.
Esc	If you press this key: <ul style="list-style-type: none">• On one of the primary menu screens, the <u>Exit</u> menu displays.• On a submenu screen, the previous screen displays.• When you are making selections from a pop-up menu, closes the pop-up without making a selection.

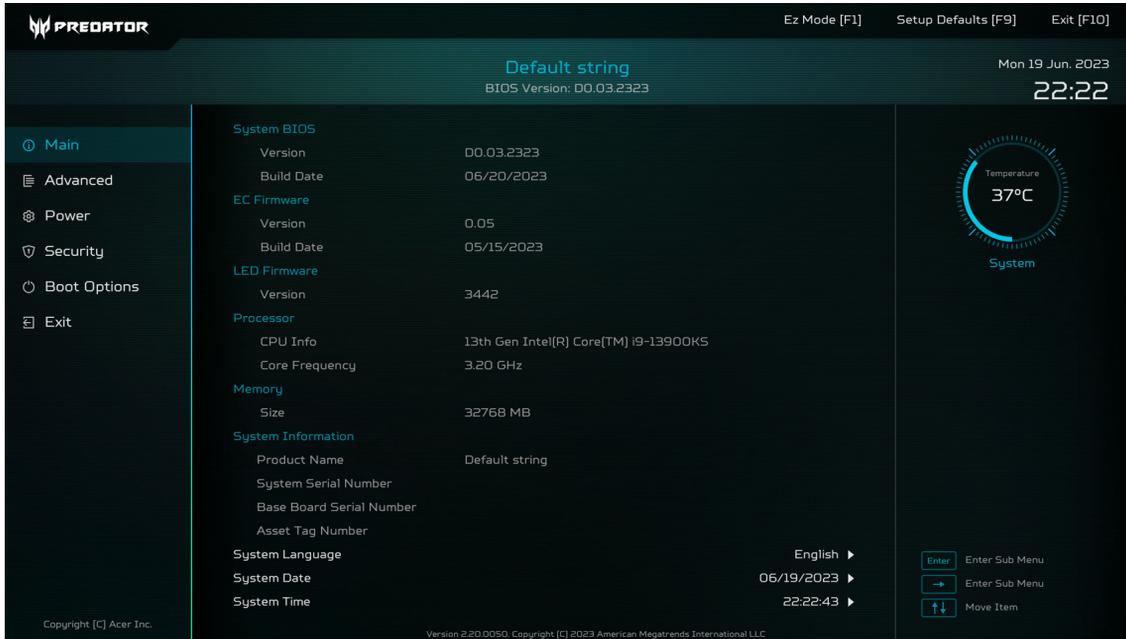
Advanced Settings Menus

The Advanced Settings has five menus for configuring the various system functions. These include:

Main	Advanced	Power	Security	Boot Options	Exit
-------------	-----------------	--------------	-----------------	---------------------	-------------

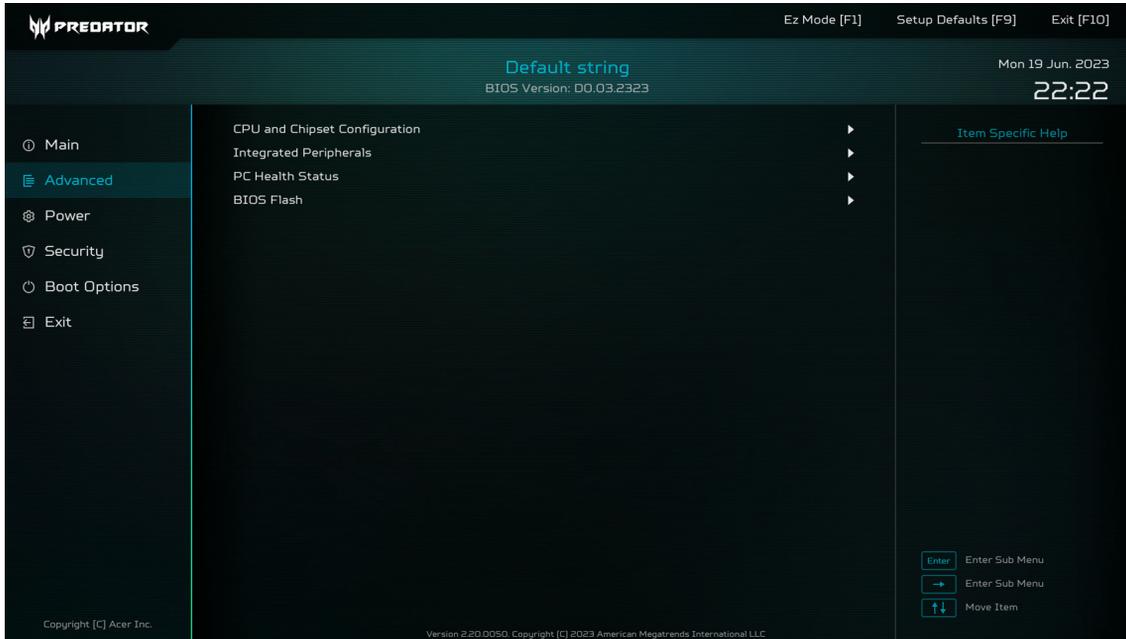
- NOTES**
- The screenshots used in this section are for illustration only. The values displayed may not be the same as those in your computer.
 - In the descriptive tables following each of the menu screen illustrations, settings in **boldface** are the default and suggested settings.

Main menu



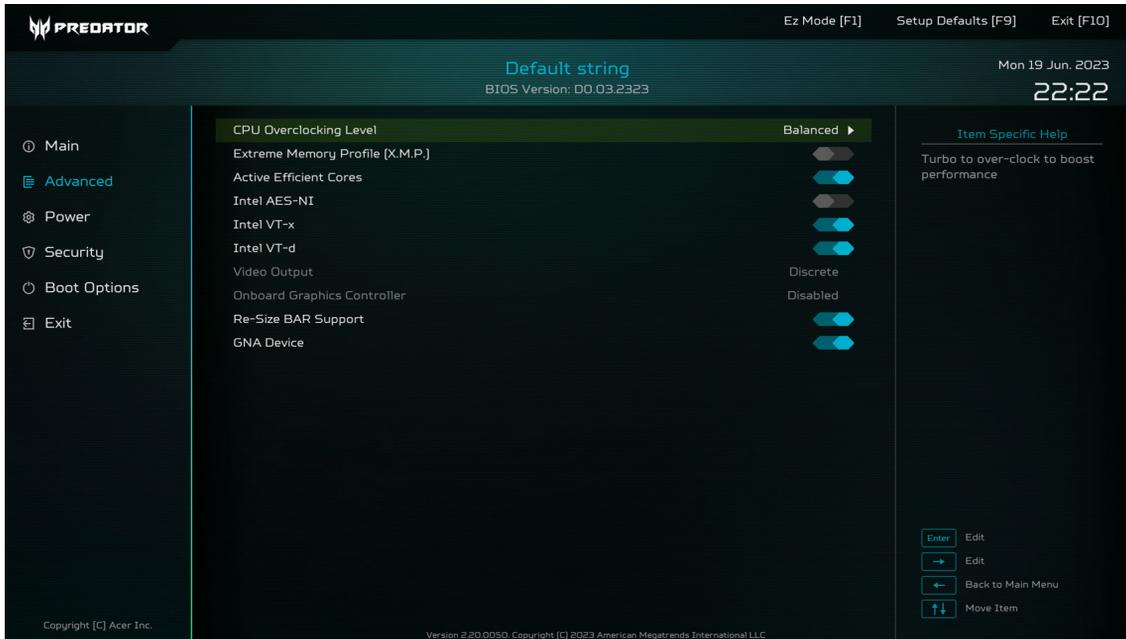
Field	Description
System BIOS	
Version	Current system BIOS version
Build Date	Date when the system BIOS was built.
EC Firmware	
Version	Current system Embedded Control Firmware version
Build Date	Date when the Embedded Control Firmware was built.
Processor	
<model>	Processor model installed
Core Frequency	Core frequency of the installed processor
Memory	
Size	Size of system memory detected during boot-up
Product Name	Official model name of the computer.
System Serial Number	System serial number.
Base Board Serial Number	Base board serial number.
Asset Tag Number	System asset tag number
System Date	Sets the system date.
System Time	Sets the system time.

Advanced



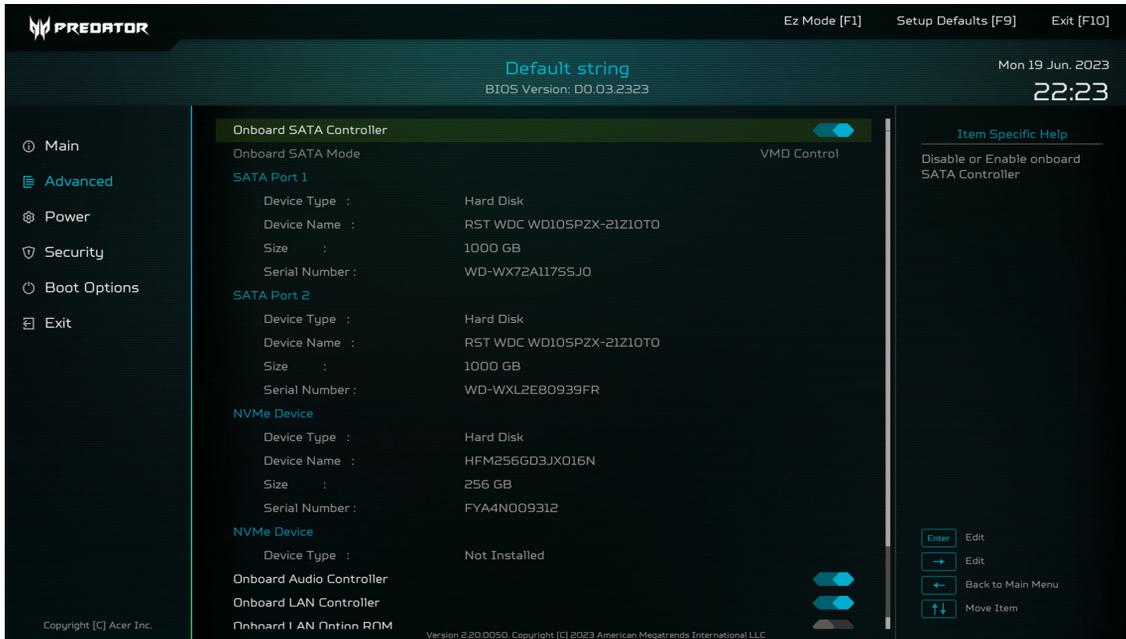
Parameter	Description
CPU and Chipset Configuration	Access this submenu to enable or disable various Intel technology functions and configure video memory settings.
Integrated Peripherals	Access this submenu to enable or disable operation modes for the onboard I/O controllers.
PC Health Status	Access this submenu to view current level of system/processor/PCH temperature, voltages, and fan speed.
BIOS Flash	Select this option to manually update the BIOS using a USB flash drive.

Advanced Chipset Configuration



Parameter	Description	
CPU Overclocking Level	Select Overclocking Level based on user preference.	Balanced Performance Turbo Quiet
Extreme Memory Profile (X.M.P.)	Select whether to enable or disable Extreme Memory Profile (X.M.P.) function.	Enabled Disabled
Active Efficient Cores	Select whether to enable or disable the Active Efficient Cores function of the processor.	Enabled Disabled
Intel AES-NI	Select whether to enable the Intel Advanced Encryption Standard New Instructions.	Enabled Disabled
Intel VT-x	Select whether to enable the Intel Virtualization Technology. VT allows a single platform to run multiple operating systems in independent partitions.	Enabled Disabled
Intel VT-d	Select whether to enable the Intel Virtualization Technology for Directed I/O which enables protection by restricting direct memory access (DMA) of the devices to pre-assigned domains or physical memory regions.	Enabled Disabled
Video Output	Shows information on display adapter that the system will use.	Discrete UMA
Onboard Graphics Controller	Shows status information on the Onboard Graphics Controller.	Enabled Disabled
Re-Size BAR Support	Enable or disable Re-Size BAR support function. Resizable BAR (Re-Size BAR) is an advanced PCI Express feature that enables the CPU to access the entire GPU frame buffer at once and improve performance. NOTE: This option is only available when Above 4G Decoding is enabled.	Enabled Disabled
GNA Device	Enable or disable Intel® Gaussian & Neural Accelerator (Intel® GNA).	Enabled Disabled

Integrated Peripherals



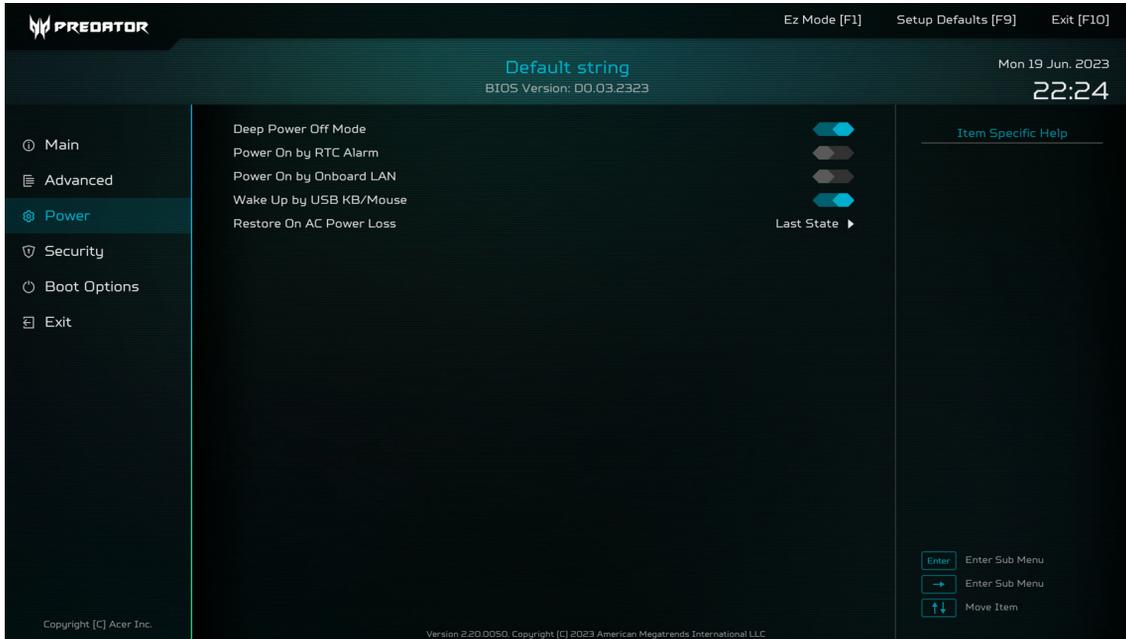
Parameter	Description	Option
Onboard SATA Controller	Enables or disables the onboard SATA controller.	Enabled Disabled
Onboard SATA Mode	Select an operating mode for the onboard SATA.	AHCI VMD Control
SATA Port 1/2	Shows information on devices connected to the SATA ports.	
NVMe Device1/2	Shows information on devices connected to the M.2 PCIe SSD.	
Onboard Audio Controller	Enables or disables the onboard audio controller.	Enabled Disabled
Onboard LAN Controller	Enables or disables the onboard LAN controller.	Enabled Disabled
Onboard LAN Option ROM	Enables or disables the load of embedded option ROM for onboard network controller.	Enabled Disabled
Intel (R) Rapid Storage Technology	Select to configure the Intel Rapid Storage Technology (RST) function.	
Killer E2600 Gigabit Ethernet Controller	Select to configure the Killer E2600 LAN configuration.	

PC Health Status



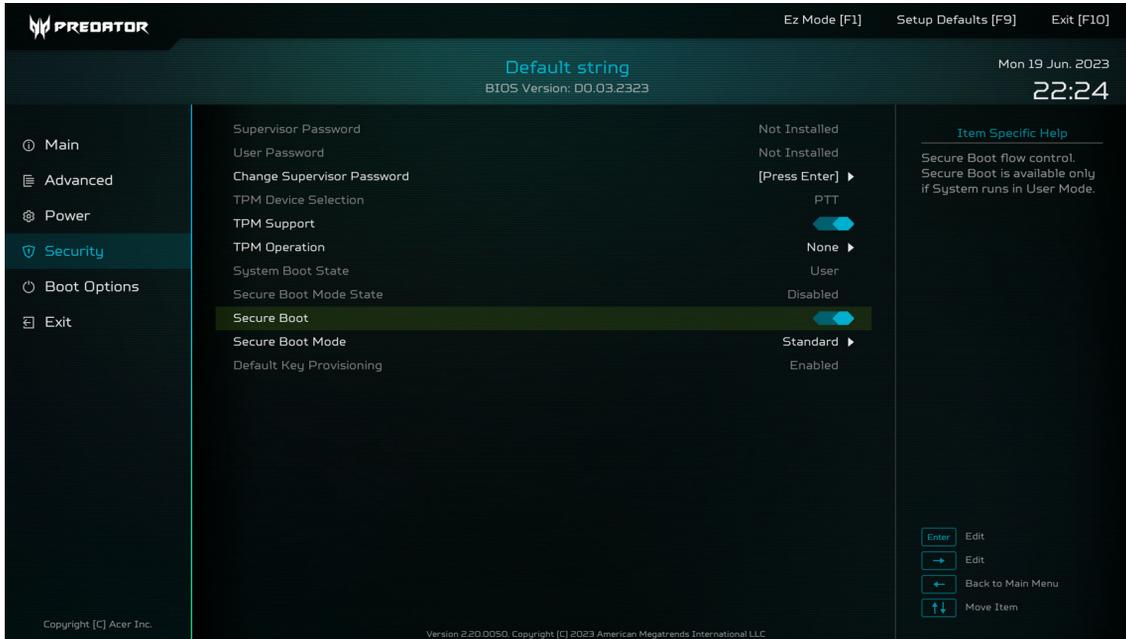
Parameter	Description	Option
CPU Temperature System Temperature VRD Temperature CPU Fan Speed Vcore DIMM Voltage 12V 5V 3.3V	These items lets you monitor the parameters for critical voltages, temperatures and fan speeds.	
System Shutdown Temperature	Enables or disables the System Shutdown Temperature function.	Enabled Disabled
VRD Shutdown Temperature	Enables or disables the VRD Shutdown Temperature function.	Enabled Disabled
Smart Fan	Enables or disables the smart system fan control function.	Enabled Disabled
CPU TCC Activation	Enables or disables the processor's Thermal Control Circuit (TCC) activation function.	Enabled Disabled

Power



Parameter	Description	Option
Deep Power Off Mode	Enables or disables the deep power off mode.	Enabled Disabled
Power On by RTC Alarm	Enables or disables real time clock (RTC) to generate a wake event.	Enabled Disabled
Power On by Onboard LAN	Enables or disables the system to wake up from a power-saving mode when an onboard LAN card received an incoming call.	Enabled Disabled
Wake Up by USB KB/ Mouse	Enables or disables to wake up the system from a power saving mode using a USB keyboard or mouse.	Enabled Disabled
Restore On AC Power Loss	Enables or disables the system to reboot after a power failure or interrupt occurs.	Power Off Power On Last State

Security



Parameter	Description	Option
Supervisor Password	Displays the supervisor password status. When set to <i>Installed</i> , this password will allow the user to access and change all settings in the Setup Utility.	Installed Not Installed
User Password	Displays the user password status. Only the following menus will be accessible when this password is used to logged in: <ul style="list-style-type: none"> System Date and System Time Exit Without Saving The F9 key (Load Default Settings) will also be unavailable.	
Change Supervisor Password	Press Enter to change the supervisor password.	
Change User Password	Press Enter to change the user password. Note that this field: <ul style="list-style-type: none"> is only accessible when a supervisor password is set; is cleared when the supervisor password is cleared. 	
TPM Device Selection	Displays supported TPM device.	PTT
TPM Support	Enables or disables the Trusted Platform Module (TPM) function.	Enabled Disabled
TPM Operation	Displays the current Trusted Platform Module (TPM) operation.	None Enable Take Ownership Disable Take Ownership Clear
System Boot State	Displays the current system boot status. <ul style="list-style-type: none"> <i>Setup</i> - Secure keys not installed. <i>User</i> - Secure keys installed 	Setup User
Secure Boot Mode State	Displays the current system boot mode status.	Enabled Disabled

Parameter	Description	Option
Secure Boot	Enables or disables the secure boot function.	Enabled Disabled
Secure Boot Mode	Select the secure boot mode when secure boot is enabled.	Standard Custom
Default Key Provisioning	Enables or disables the default key provisioning function.	Enabled Disabled

Note the following before you define a system password:

- The maximum length of password contains 8 alphanumeric characters. The following keys are valid:
 - A-Z, a-z (case-insensitive)
 - 0-9
 - ` - + [] \ ; ' , . / ,
 - Special keypad characters: 0-9 / * - +
- When you are prompted to enter a password, you have three tries before the system halts. Do not forget your password. If you forget your password, you may have to return your computer to your dealer to reset it.

To set a system password:

NOTE You need to set a supervisor password first before setting the user password.

1. Select Change Supervisor Password or Change User Password, then press **Enter**.

The password box appears.

2. Type a password then press **Enter**.

IMPORTANT Be very careful when typing your password because the characters do not appear on the screen. Only shaded blocks representing each typed character are visible.

3. Retype the password to verify the first entry, then press **Enter**.

You will be prompted to save the new password.

4. Press **Enter**.
5. Press **F10** to save the password and close the Setup Utility.

To change a system password:

1. Select Change Supervisor Password or Change User Password, then press **Enter**.

The password box appears.

2. Type the original password, then press **Enter**.
3. Type a new password, then press **Enter**.
4. Retype the new password to verify the first entry, then press **Enter**.

You will be prompted to save the new password.

5. Press **Enter**.
6. Press **F10** to save the password and close the Setup Utility.

To remove a system password:

NOTE When the supervisor password is removed, the user password will also be remove.

1. Select Change Supervisor Password or Change User Password, then press **Enter**.

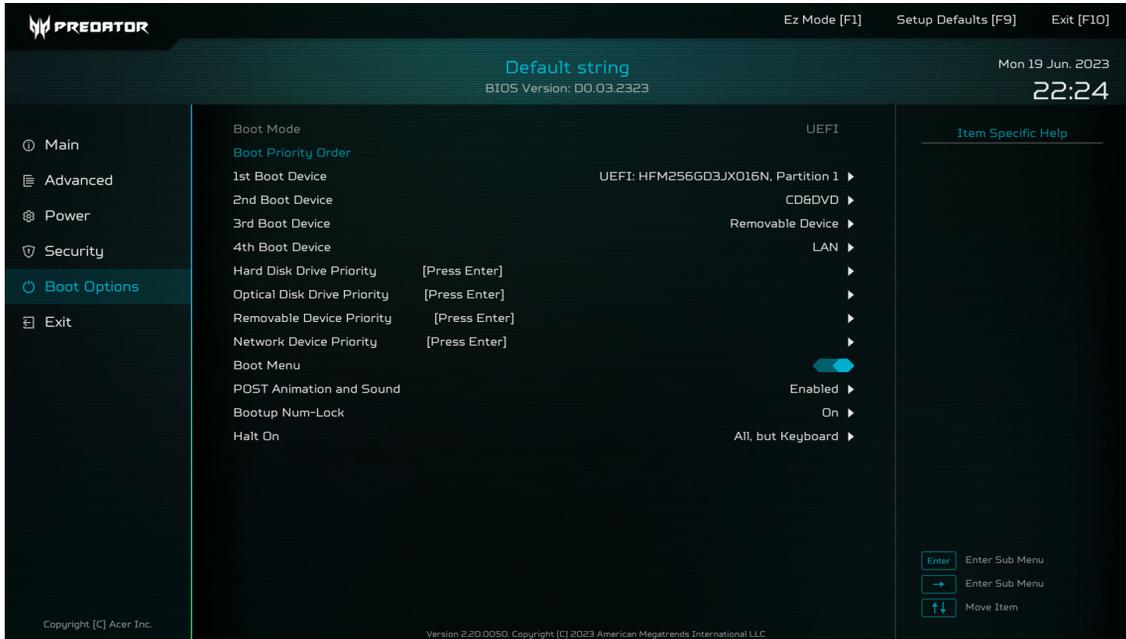
The password box appears.

2. Type the original password, then press **Enter**.
3. Press **Enter** twice without entering anything in the new and confirm password fields.

You will be prompted to confirm the password removal.

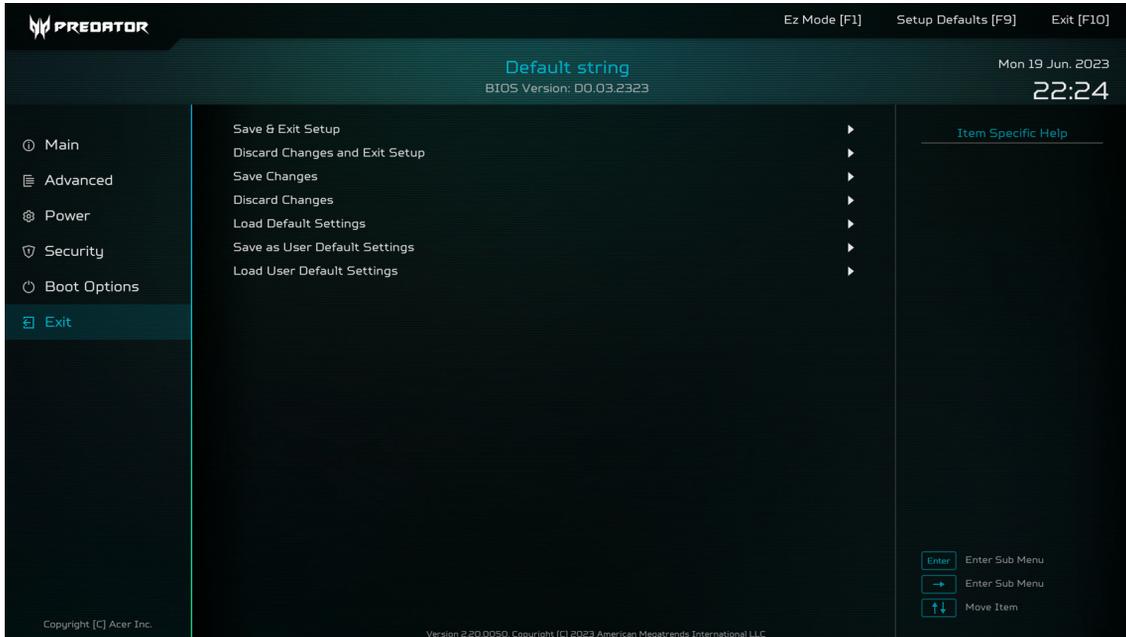
4. Press **Enter**.
5. Press **F10** to save the changes you made and close the Setup Utility.

Boot Options



Parameter	Description	Option
Boot Priority Order 1st Boot Device 2nd Boot Device 3rd Boot Device 4th Boot Device	Displays the device assigned to the specified boot sequence. The Setup Utility attempts to boot the operating system in this order. By default, the computer searches for boot devices in the following order: <ul style="list-style-type: none"> • Windows Boot Manager • Optical drive (CD/DVD) • Removable device • Network boot (LAN) 	
Hard Disk Drive Priority	Press Enter to set the boot priority for the hard drive.	
Optical Disc Drive Priority	Press Enter to set the boot priority for the optical drive.	
Removable Device Priority	Press Enter to set the boot priority for a removable USB drive.	
Network Device Priority	Press Enter to set the boot priority for a network boot.	
Boot Menu	Enable or disable the boot menu function.	Enabled Disabled
Post Animation and Sound	Enable or disable animation and sound during boot.	Enabled Disabled
Bootup Num-Lock	Enables or disables the Num-Lock key during boot.	On Off
Halt On	Determines whether the system will stop for an error during the POST. Options include: <ul style="list-style-type: none"> • All, but Keyboard – If a keyboard error is detected, BIOS will pause the system. • All Errors – Any error detected will pause the system. • No Errors – BIOS will ignore any errors detected during POST 	All, But Keyboard All Errors No Errors

Exit



Parameter	Description
Save & Exit Setup	When you have completed the system configuration changes, select this option to leave the BIOS Setup Utility and reboot the computer, so the new system configuration parameters can take effect. Select Save & Exit Setup from the Exit menu and press Enter .
Discard Changes and Exit Setup	Select this option to quit the BIOS Setup Utility without making any permanent changes to the system configuration, and reboot the computer. Select Discard Changes and Exit Setup from the Exit menu and press Enter .
Save Changes	Select this option and press Enter to save all the changes and return to the BIOS Setup Utility.
Discard Changes	Select this option and press Enter to discard all the changes and return to the BIOS Setup Utility.
Load Default Settings	To set this feature, select Load Default Settings from the Exit menu and press Enter . Then, select OK to allow the BIOS to automatically load optimal defaults to the BIOS settings. The Optimal settings are designed for maximum system performance, but may not work best for all computer applications.
Save as User Default Settings	Select this option and press Enter to save changes that you have made as user defaults.
Load User Default Settings	Select this option and press Enter to restore user defaults.

System Disassembly and Reassembly

This chapter provides step-by-step instructions on how to disassemble the computer for maintenance and troubleshooting purposes.

Disassembly Tools

In performing the disassembly process, you will need the following tools:

- Wrist-grounding strap and conductive mat for preventing electrostatic discharge
- Philips screwdriver
- Hex screwdriver
- Flat screwdriver
- Scissors (for cutting cable ties)

NOTES The screws for the different components vary in size. During the disassembly process, group the screws with their corresponding components to avoid mismatches when putting back the components.

Pre-disassembly Procedure

Before proceeding with the disassembly procedure, perform the steps listed below:

1. Make sure that the optical disc drive and the card reader slot are empty.
2. Turn off the power to the computer and all peripherals.
3. Unplug the power cord from the computer.
4. Unplug the network cable and all connected peripheral devices from the computer.
5. Place the computer on a flat, steady surface with the rear cover facing upward.

Disassembly Procedures

Removing the Portable SSD Device

1. Open the portable SSD device slot cover.



2. Pull out the portable SSD device from the chassis.

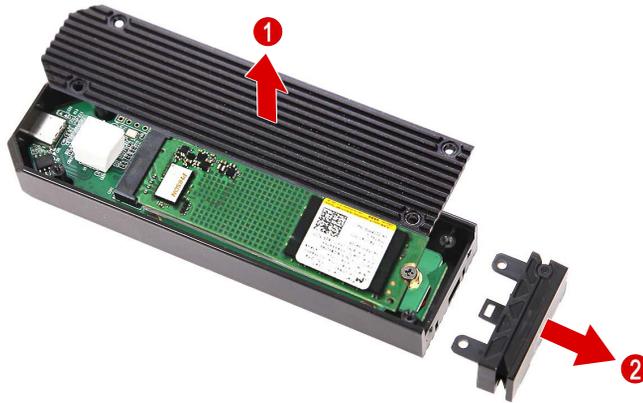


- Remove the four screws securing the portable SSD device cover.



Quantity	Color	Torque	Part Number	Screw Type
4	Black	1.5 ± 0.2 kgf-cm	N/A	

- Detach the top and front cover of the portable SSD device.

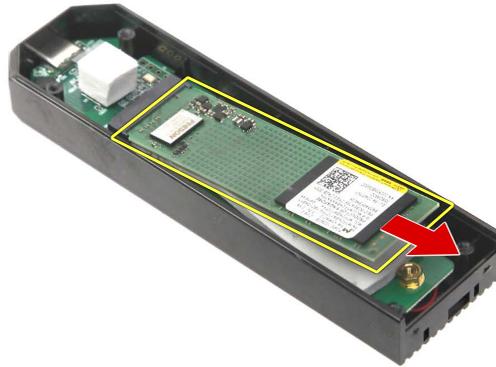


- Remove the screw securing the SSD module to the portable SSD device.



Quantity	Color	Torque	Part Number	Screw Type
1	Black	1.5 ± 0.3 kgf-cm	N/A	

-
6. Remove the SSD module from the portable SSD device.



Note: WEEE Annex VII component. A circuit board >10 cm² has been highlighted with the yellow rectangle as shown above. Please follow local regulations for disposal of detached circuit boards.

7. Detach the thermal pad from the portable SSD device.



Removing the Left Side Panel

1. Remove the two screws securing the left side panel to the chassis.



Quantity	Color	Torque	Part Number	Screw Type
2	Black	4.0 ± 0.5 kgf-cm	N/A	

2. Detach the left side panel.



Removing the Graphics Card

1. Disconnect the power cable from the graphics card.



2. Remove the three screws securing the graphics card brackets to the chassis.



Quantity	Color	Torque	Part Number	Screw Type
3	Black	6.0 ± 0.5 kgf-cm	86.SR2D1.001	

3. Unlatch the metal clip securing the graphics card bracket to the chassis.



4. Detach the graphics card from the PCIe x16 extension slot.



Note: WEEE Annex VII component. A circuit board >10 cm² has been highlighted with the yellow rectangle as shown above. Please follow local regulations for disposal of detached circuit boards.

Removing the Right Side Panel

1. Remove the two screws securing the right side panel to the chassis.



Quantity	Color	Torque	Part Number	Screw Type
2	Black	4.0 ± 0.5 kgf-cm	N/A	

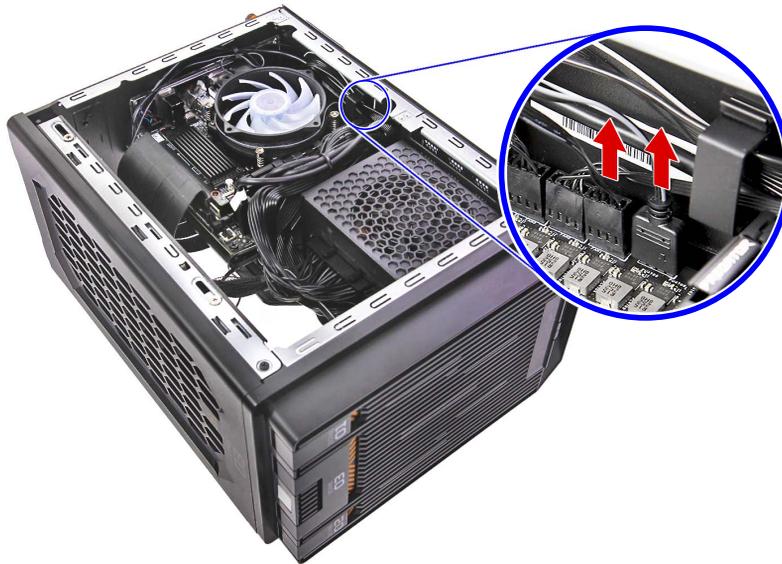
2. Detach the right side panel.



Removing the Thermal Module

WARNING: The heatsink becomes very hot when the system is on. NEVER touch the heatsink with any metal or with your hands.

1. Disconnect the heatsink fan and LED cables from the mainboard.



2. Loosen the four captive screws securing the thermal module to the mainboard.



Quantity	Color	Torque	Part Number	Screw Type
4	Silver	6.0 ± 0.5 kgf-cm	N/A	Thermal Screws

3. Remove the thermal module.



Removing the Processor

IMPORTANT: Before removing a processor from the mainboard, make sure to create a backup file of all important data.

WARNING: The processor becomes very hot when the system is on. Allow it to cool off first before handling.

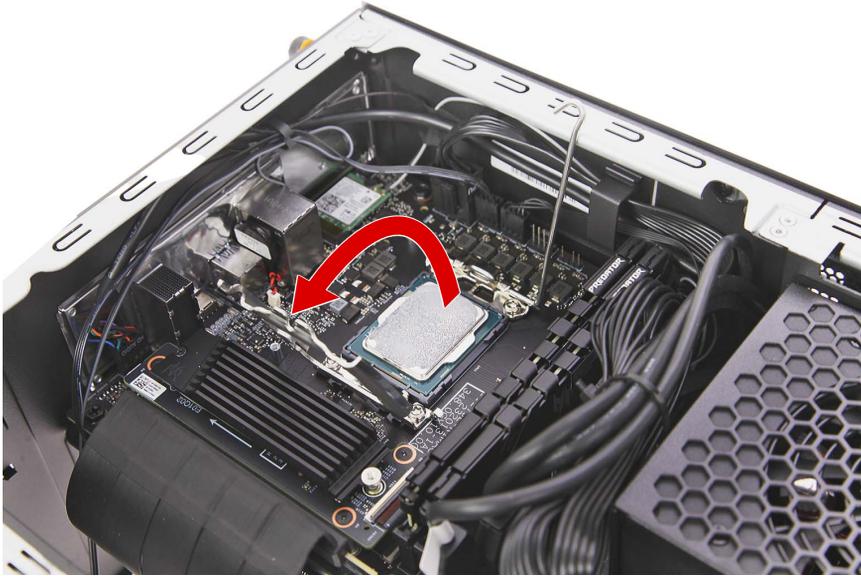
1. Press the load lever and move it to the right to release the load lever from the retention tab.



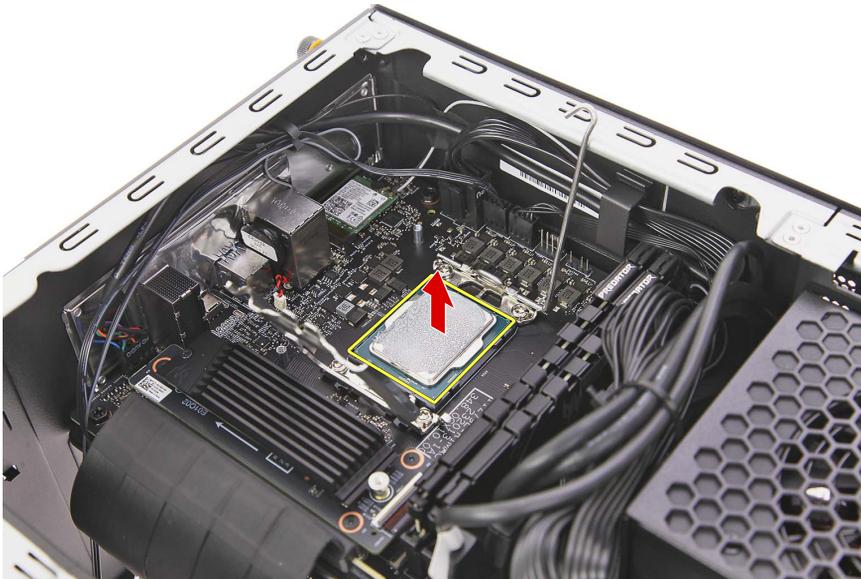
2. Pull the load lever to release the processor from its socket.



3. Open the CPU cover plate.



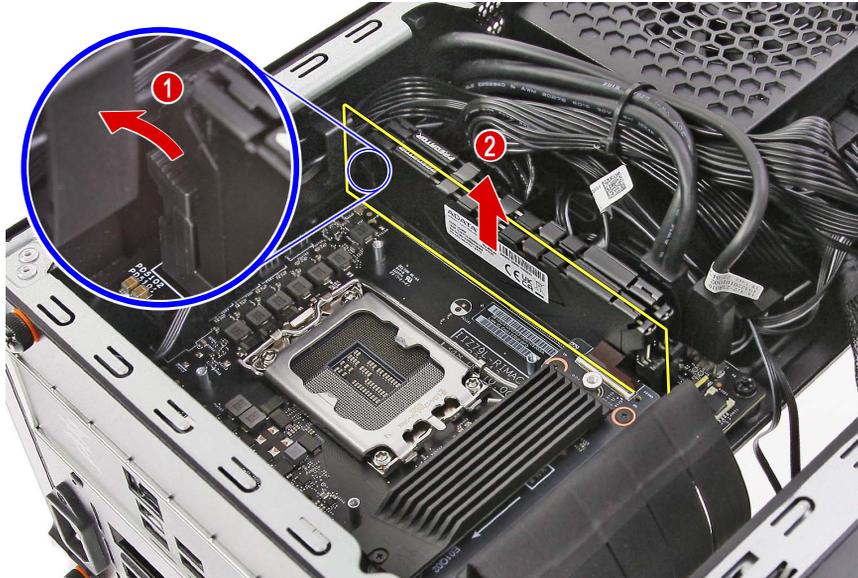
4. Lift the processor from the socket.



Note: WEEE Annex VII component. A circuit board >10 cm² has been highlighted with the yellow rectangle as shown above. Please follow local regulations for disposal of detached circuit boards.

Removing the Memory Modules

1. Press outward the holding clip on the left side of the DIMM slot to release the DIMM (1), then gently pull the DIMM upward to remove it from the mainboard (2).



Note: WEEE Annex VII component. A circuit board >10 cm² has been highlighted with the yellow rectangle as shown above. Please follow local regulations for disposal of detached circuit boards.

2. Repeat Step 1 to remove the remaining memory module.

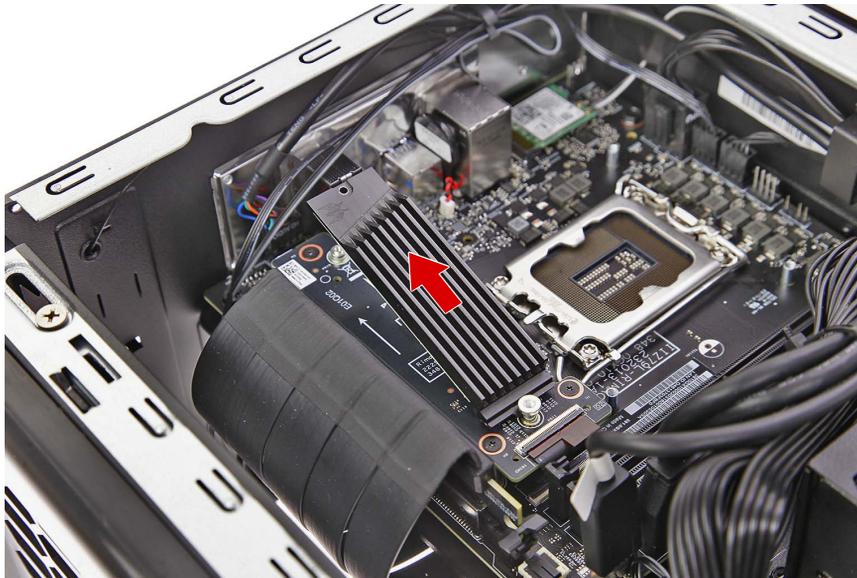
Removing the SSD2 Module

1. Remove the screw securing the SSD2 module assembly to the mainboard.

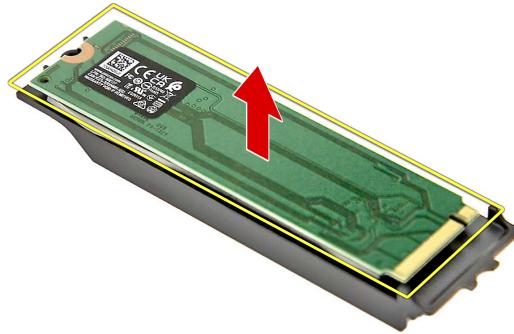


Quantity	Color	Torque	Part Number	Screw Type
1	Black	1.5 ± 0.3 kgf-cm	86.BFZD1.001	

2. Remove the SSD2 module assembly from the mainboard.



-
3. Detach the SSD2 module from the SSD heatsink.



Note: WEEE Annex VII component. A circuit board >10 cm² has been highlighted with the yellow rectangle as shown above. Please follow local regulations for disposal of detached circuit boards.

4. Detach the thermal pad from the SSD heatsink.



Removing the SSD Board

1. Disconnect the SSD cable from the SSD board.

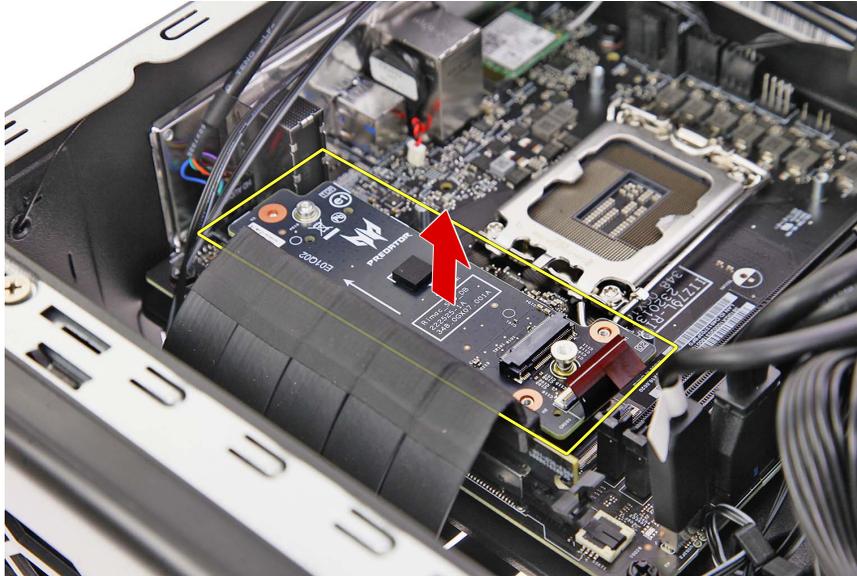


2. Remove the three screws securing the SSD board to the mainboard.



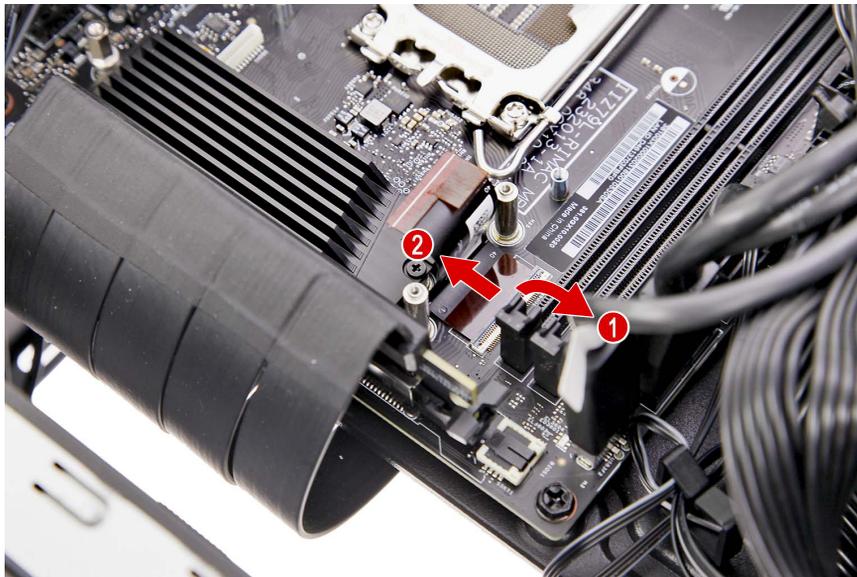
Quantity	Color	Torque	Part Number	Screw Type
3	Black	1.5 ± 0.2 kgf-cm	86.E3SD1.002	

3. Remove the SSD board from the mainboard.



Note: WEEE Annex VII component. A circuit board >10 cm² has been highlighted with the yellow rectangle as shown above. Please follow local regulations for disposal of detached circuit boards.

4. Disconnect and remove the SSD cable from the mainboard.



Removing the SSD1 Module

1. Remove the screw securing the SSD1 module assembly to the mainboard.

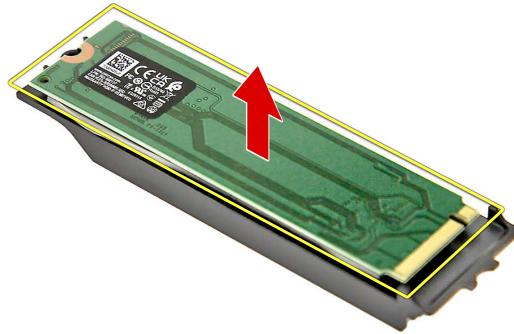


Quantity	Color	Torque	Part Number	Screw Type
1	Black	1.5 ± 0.3 kgf-cm	86.BFZD1.001	

2. Remove the SSD1 module assembly from the mainboard.



-
3. Detach the SSD1 module from the SSD heatsink.



Note: WEEE Annex VII component. A circuit board >10 cm² has been highlighted with the yellow rectangle as shown above. Please follow local regulations for disposal of detached circuit boards.

4. Detach the thermal pad from the SSD heatsink.



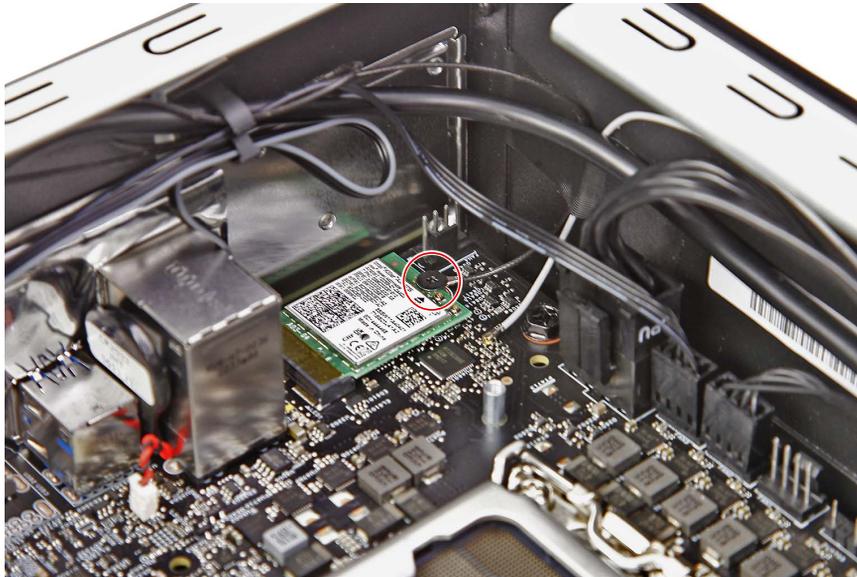
Removing the WLAN Module

1. Disconnect the WLAN antenna cables from the WLAN module.



NOTE: For reference during machine reassembly, note which cable color corresponds to the main and auxiliary connectors.

2. Remove the screw securing the WLAN module to the mainboard.



Quantity	Color	Torque	Part Number	Screw Type
1	Black	1.5 ± 0.3 kgf-cm	86.BFZD1.001	

3. Remove the WLAN module from the mainboard.



Note: WEEE Annex VII component. A circuit board >10 cm² has been highlighted with the yellow rectangle as shown above. Please follow local regulations for disposal of detached circuit boards.

Removing the Top Cover

1. Remove the two screws securing the top cover to the chassis.



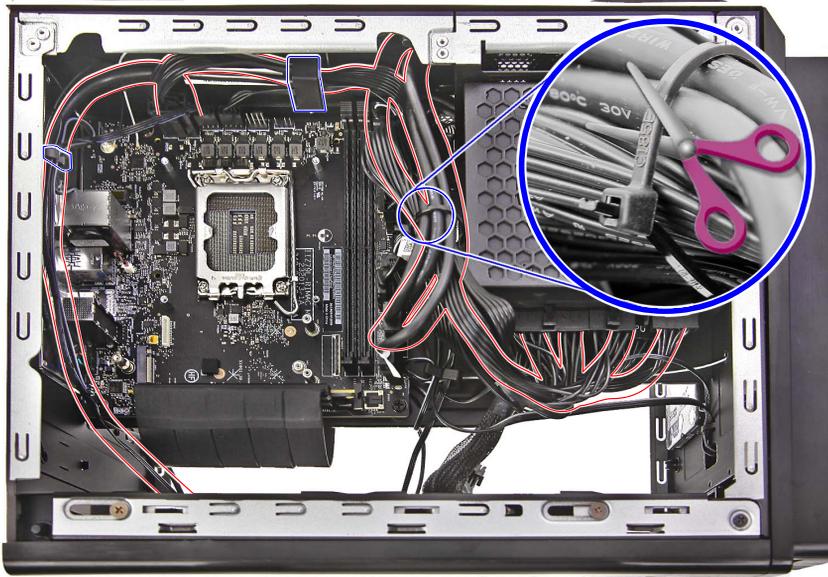
Quantity	Color	Torque	Part Number	Screw Type
2	Black	4.0 ± 0.5 kgf-cm	N/A	

2. Detach the top cover from the chassis.



Removing the Front Bezel

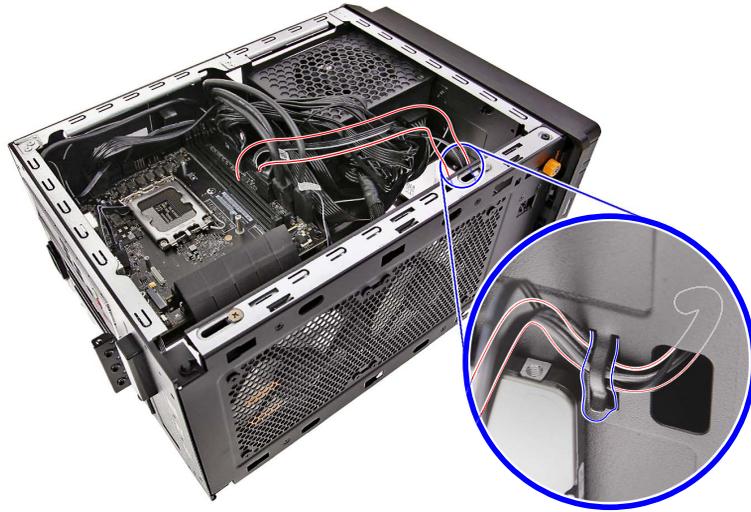
1. Release the cables from the cable tie and plastic clips that secure them to the chassis.



2. Disconnect the power button/LED cable from the mainboard.



3. Release the power button/LED cables from the metal clip that secures them to the chassis.



4. Remove the four screws securing the front bezel to the chassis.



Quantity	Color	Torque	Part Number	Screw Type
4	Black	6.0 ± 0.5 kgf-cm	86.SR2D1.001	

5. Disengage the latches securing the front bezel to the chassis.



6. Detach the front bezel from the chassis.



7. Pull out the power button/LED cables from the chassis.



Removing the Bottom Cover

1. Remove the two screws securing the bottom cover to the chassis.



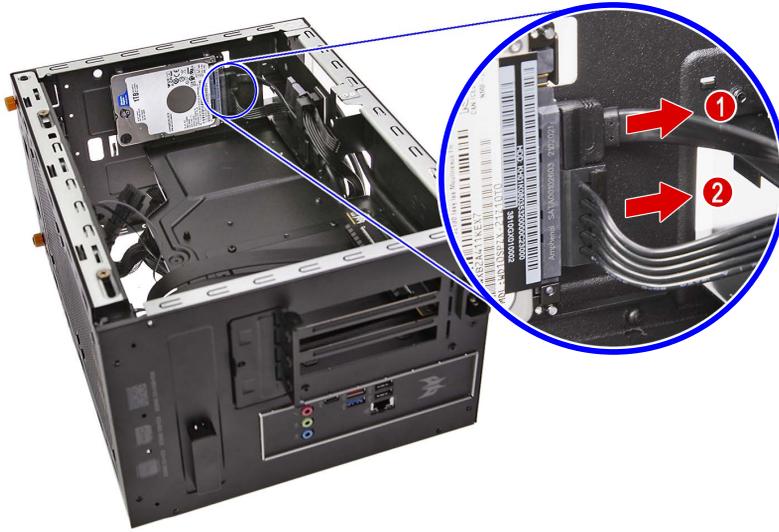
Quantity	Color	Torque	Part Number	Screw Type
2	Black	4.0 ± 0.5 kgf-cm	N/A	

2. Detach the bottom cover from the chassis.



Removing the HDD1 Module

1. Disconnect the power and data cables from the HDD1 module.

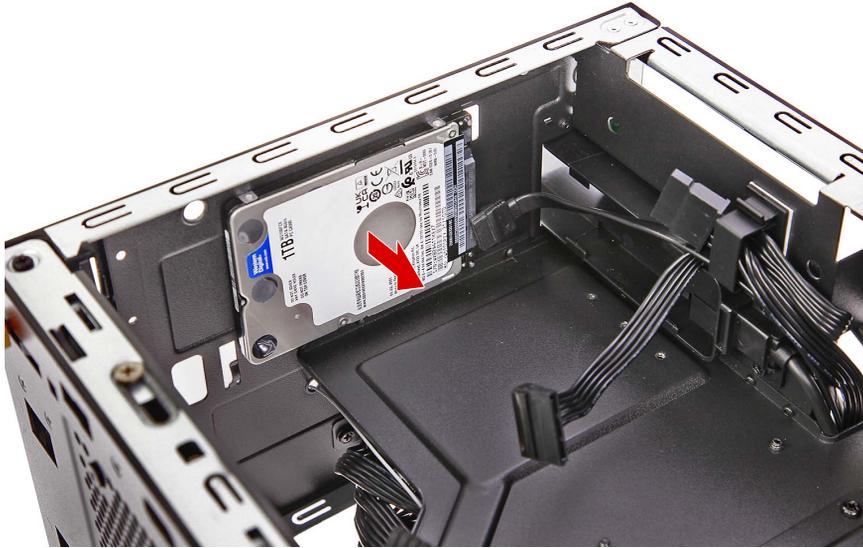


2. Remove the four screws securing the HDD1 module to the chassis.



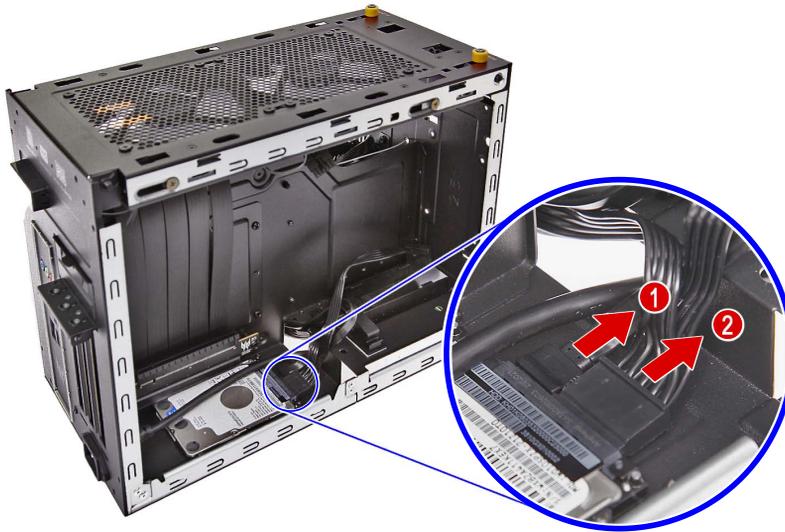
Quantity	Color	Torque	Part Number	Screw Type
4	Silver	4.0 ± 0.3 kgf-cm	86.3A534.4R0	

-
3. Detach the HDD1 module from the chassis.



Removing the HDD2 Module

1. Disconnect the power and data cables from the HDD2 module.



2. Remove the four screws securing the HDD2 module to the chassis.



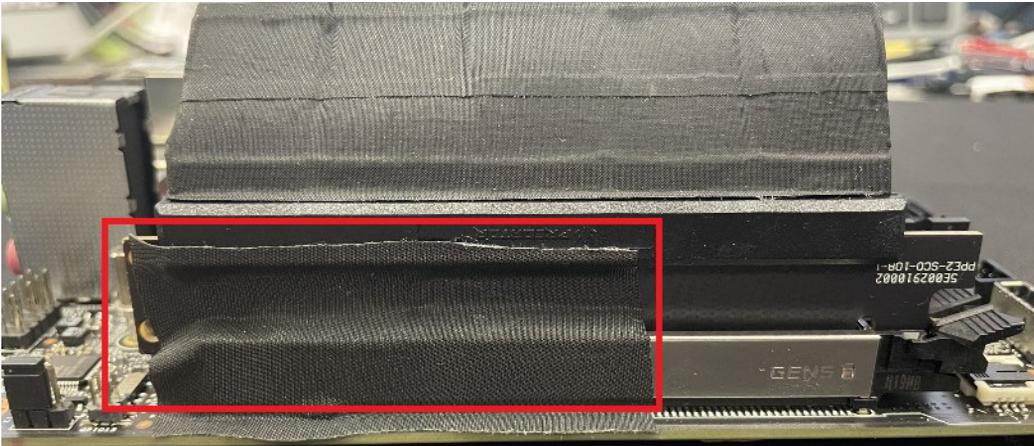
Quantity	Color	Torque	Part Number	Screw Type
4	Silver	4.0 ± 0.3 kgf-cm	86.3A534.4R0	

-
3. Detach the HDD2 module from the chassis.



Removing the PCIe x16 Extension Cable

1. Remove the adhesive tape.



2. Disconnect the PCIe x16 extension cable from the mainboard.

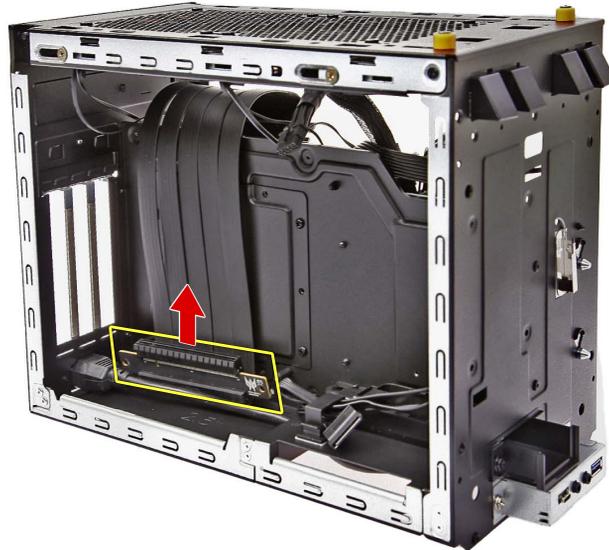


3. Remove the two screws securing the PCIe x16 extension cable to the chassis.



Quantity	Color	Torque	Part Number	Screw Type
2	Black	6.0 ± 0.5 kgf-cm	86.B9AD1.001	

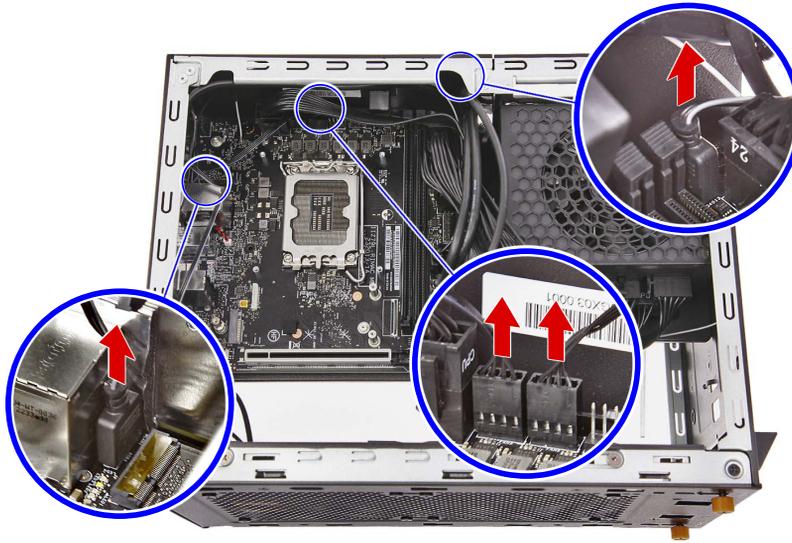
-
4. Remove the PCIe x16 extension cable from the chassis.



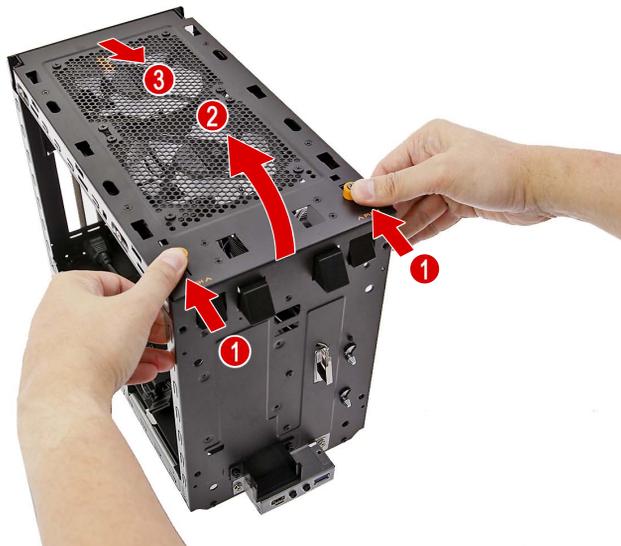
Note: WEEE Annex VII component. A circuit board >10 cm² has been highlighted with the yellow rectangle as shown above. Please follow local regulations for disposal of detached circuit boards.

Removing the System Fans

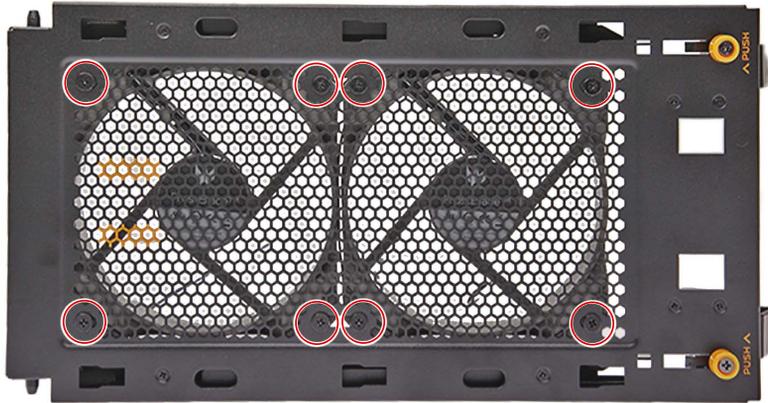
1. Disconnect the system fan power and LED cables from the mainboard.



2. Detach the upper chassis assembly.

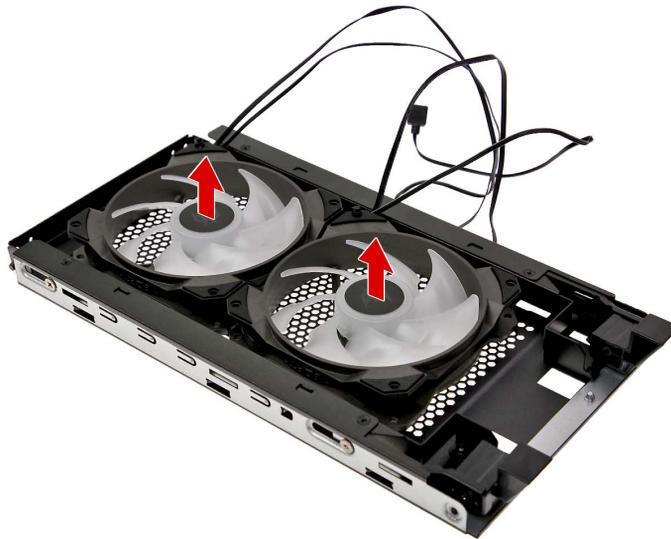


3. Remove the eight screws securing the system fans to the upper chassis assembly.



Quantity	Color	Torque	Part Number	Screw Type
8	Black	4.0 ± 0.5 kgf-cm	86.E3SD1.001	

4. Detach the system fans from the upper chassis assembly.

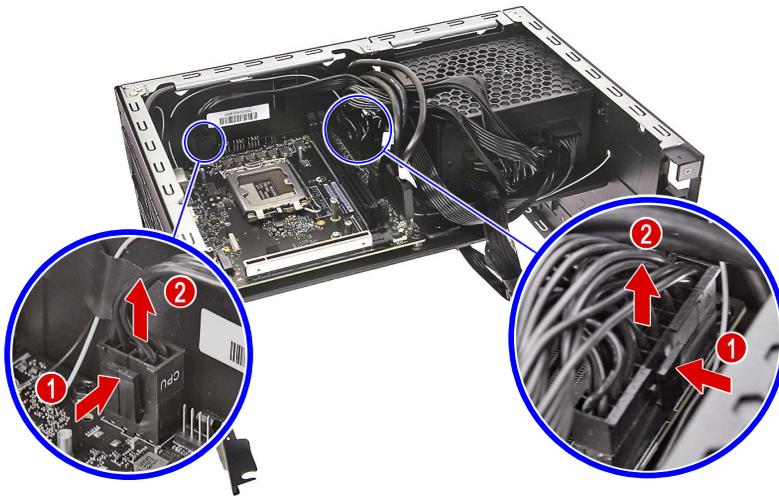


Removing the Power Supply Module

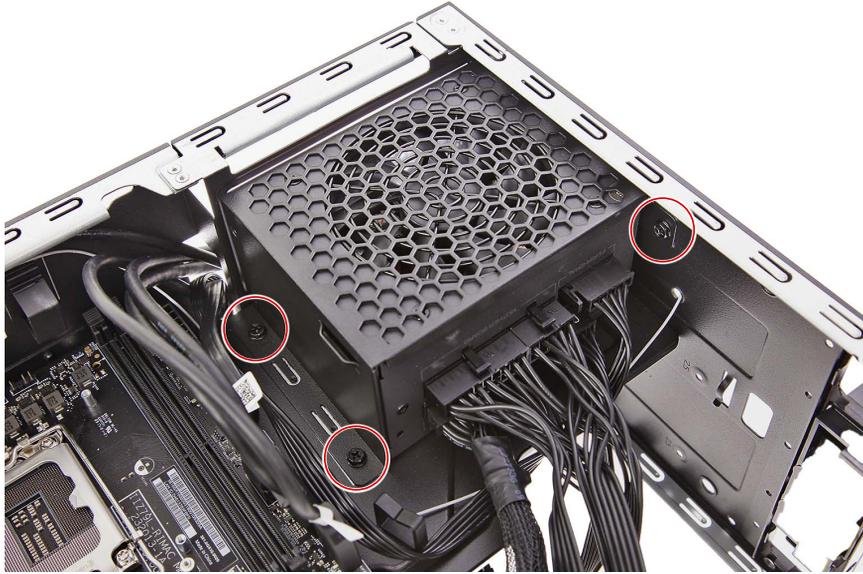
1. Disconnect the power cable extension from the power supply module.



2. Disconnect the power supply cables from the mainboard.



3. Remove the three screws securing the power supply module to the chassis.



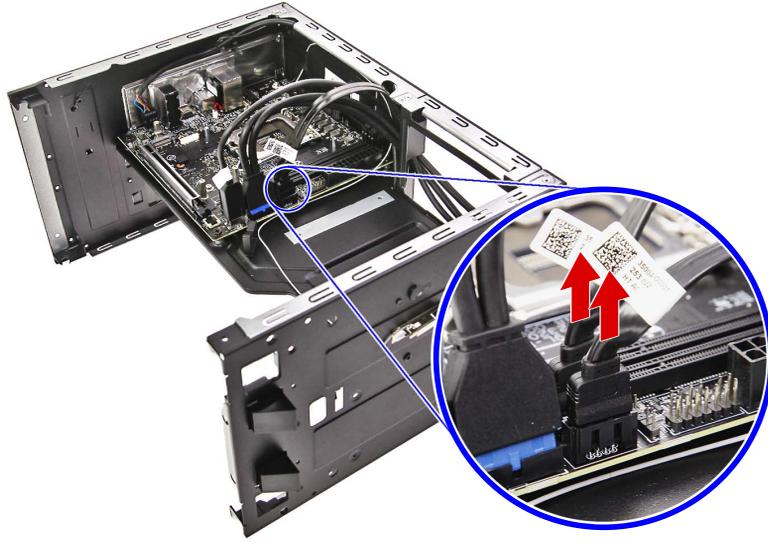
Quantity	Color	Torque	Part Number	Screw Type
3	Black	6.0 ± 0.5 kgf-cm	86.SR2D1.001	

4. Pull the power supply module out of the chassis.



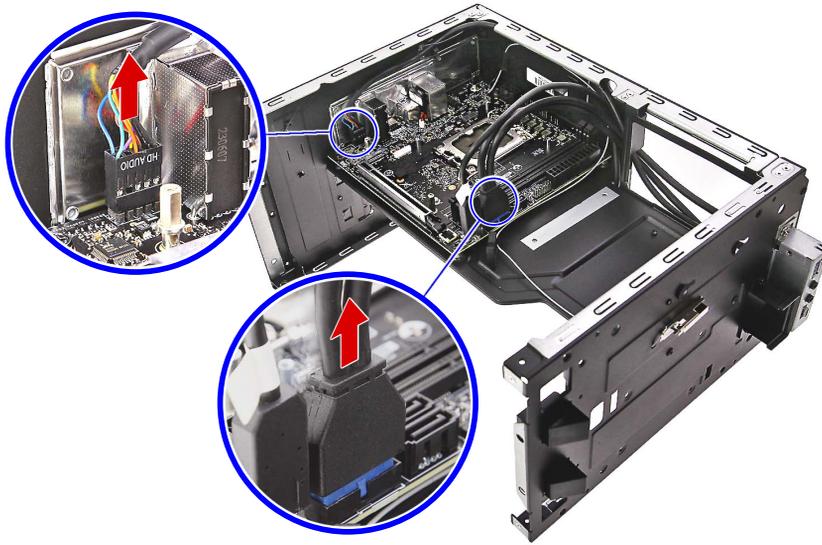
Removing the HDD SATA Cables

1. Disconnect and remove the HDD SATA cables from the mainboard.

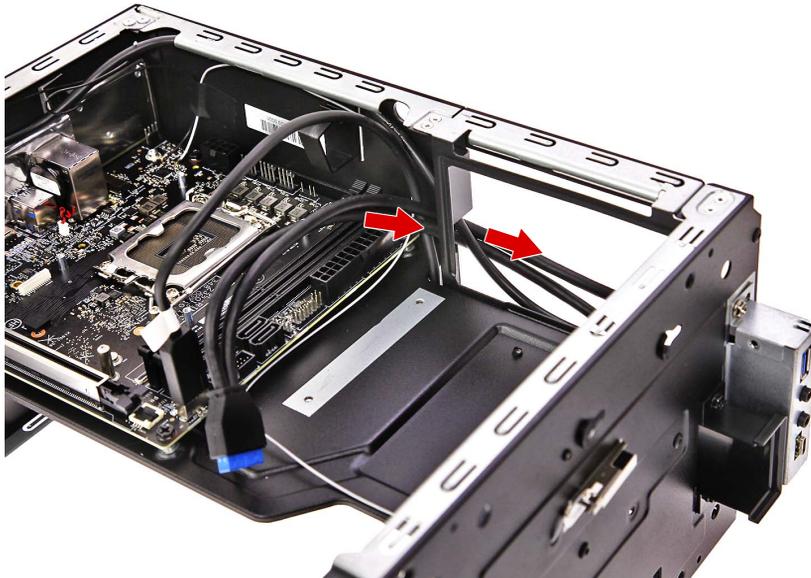


Removing the Front I/O Module

1. Disconnect the front I/O and audio cables from the mainboard.



2. Pull out the front I/O and audio cables from the chassis.



3. Remove the two screws securing the front I/O bracket to the chassis.

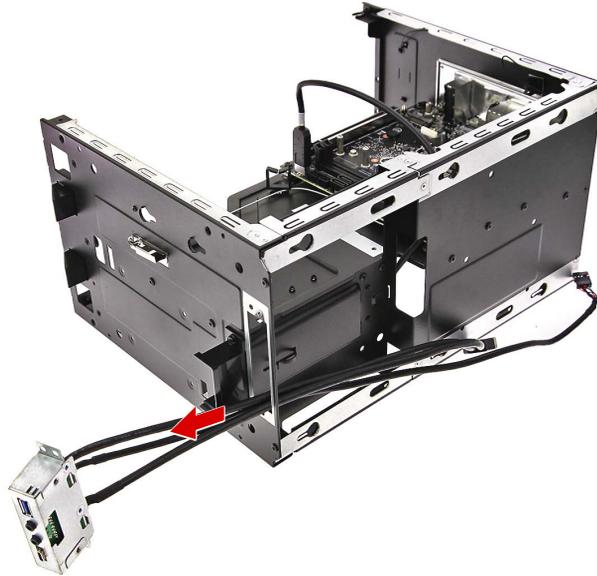


Quantity	Color	Torque	Part Number	Screw Type
2	Black	6.0 ± 0.5 kgf-cm	86.SR2D1.001	

4. Detach the front I/O bracket from the chassis.



5. Pull out the front I/O and audio cables from the chassis.

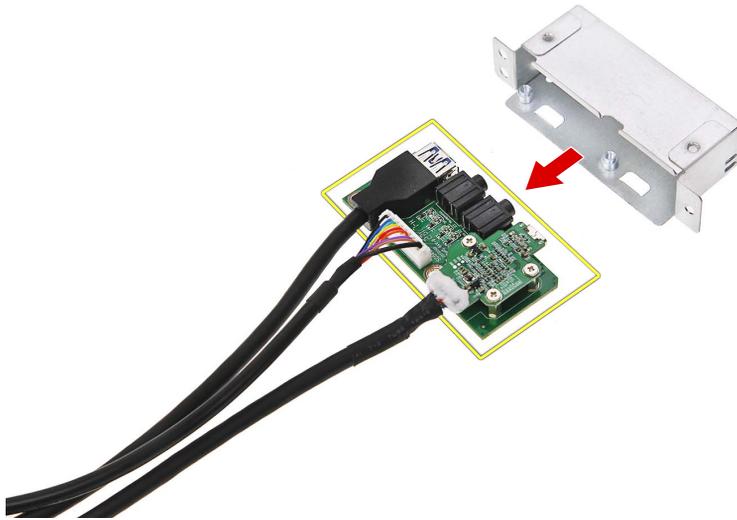


6. Remove the two screws securing the front I/O board to the bracket.



Quantity	Color	Torque	Part Number	Screw Type
2	Black	1.5 ± 0.2 kgf-cm	86.E3SD1.002	

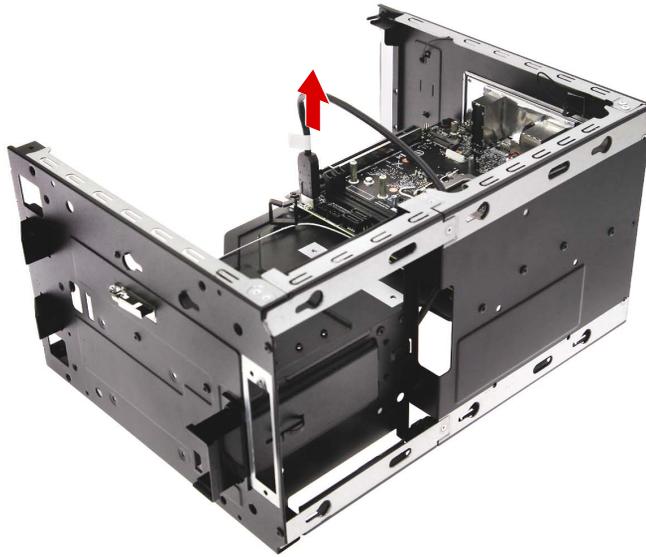
-
7. Remove the front I/O board from the bracket.



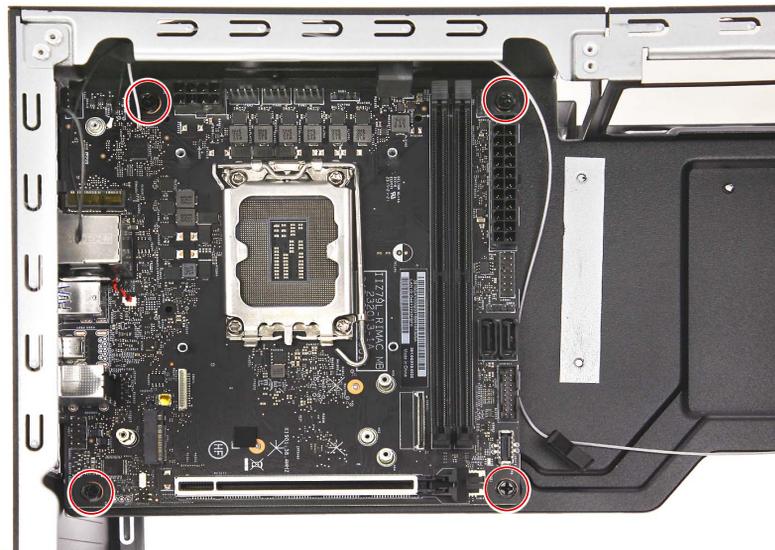
Note: WEEE Annex VII component. A circuit board >10 cm² has been highlighted with the yellow rectangle as shown above. Please follow local regulations for disposal of detached circuit boards.

Removing the Mainboard

1. Disconnect the portable SSD device cable from the mainboard.

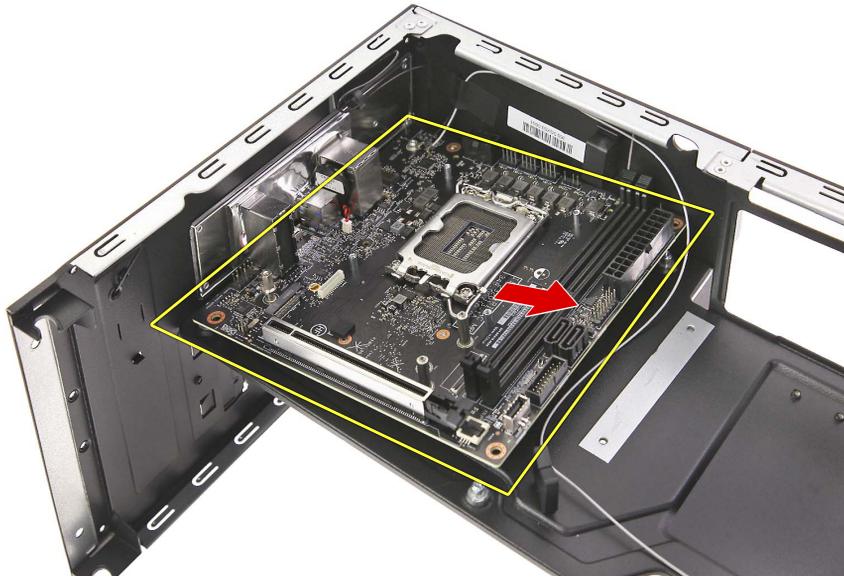


2. Remove the four screws securing the mainboard to the chassis.



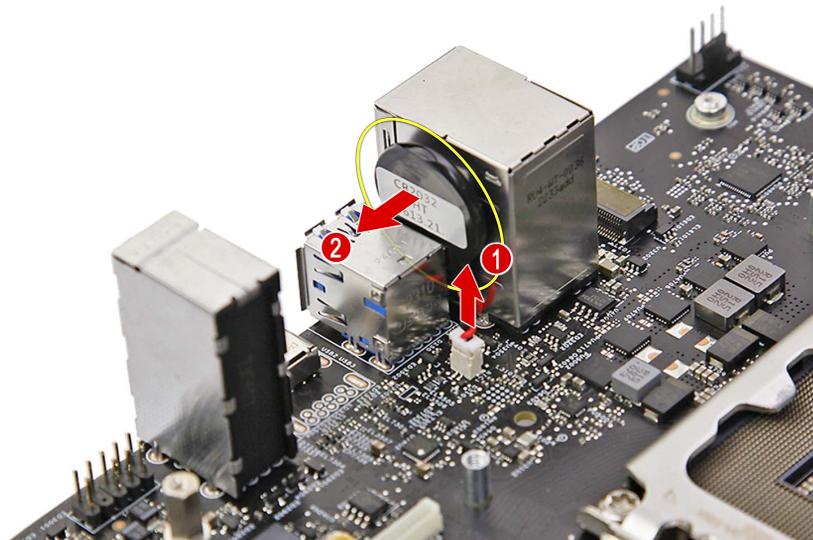
Quantity	Color	Torque	Part Number	Screw Type
4	Black	6.0 ± 0.5 kgf-cm	86.B9AD1.001	

3. Gently lift the mainboard off the chassis.



Note: WEEE Annex VII component. A circuit board >10 cm² has been highlighted with the yellow rectangle as shown above. Please follow local regulations for disposal of detached circuit boards.

4. Disconnect the RTC battery cable from the mainboard (1), then detach the RTC battery from the side of the RJ45 connector (2).



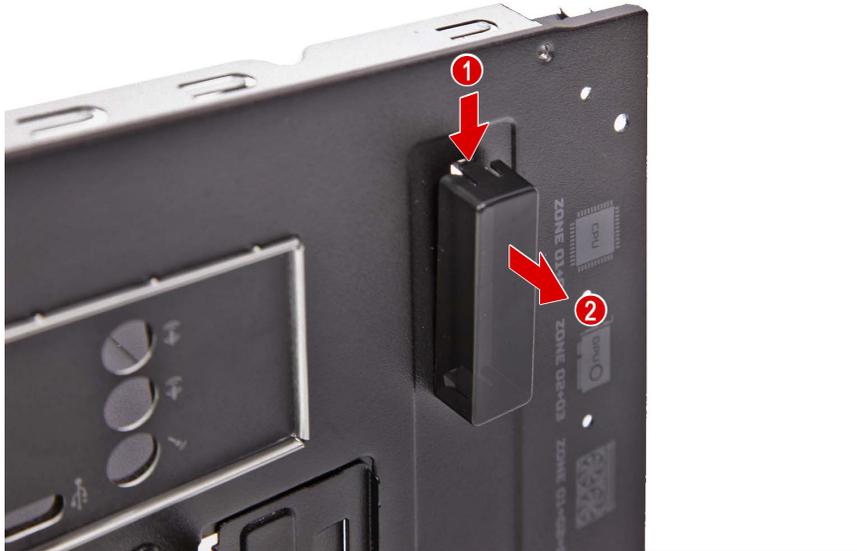
Note: WEEE Annex VII component. The RTC battery has been highlighted with the yellow circle as shown above. Please follow local regulations for disposal of used batteries.



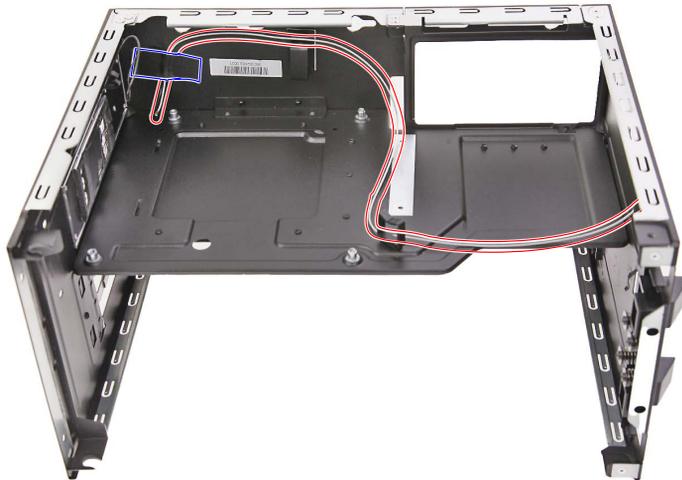
Caution: Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.

Removing the WLAN Antenna Cables

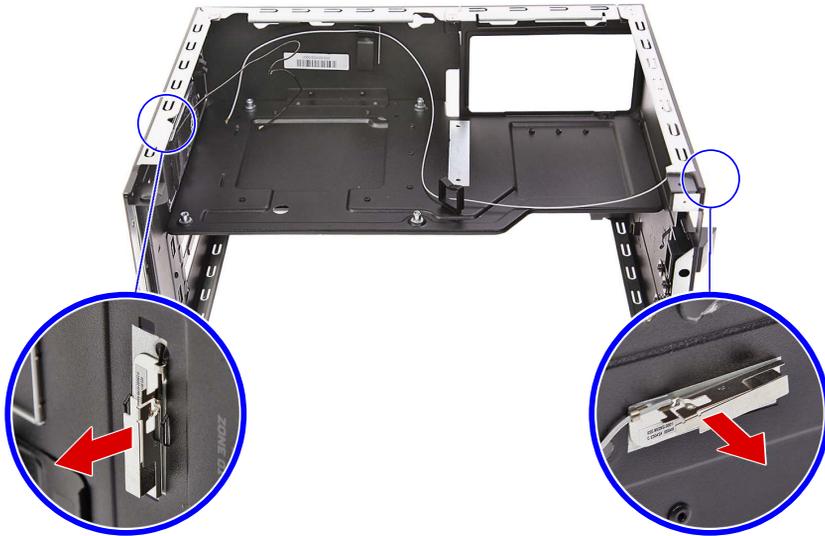
1. Detach the WLAN antenna cover from the rear chassis.



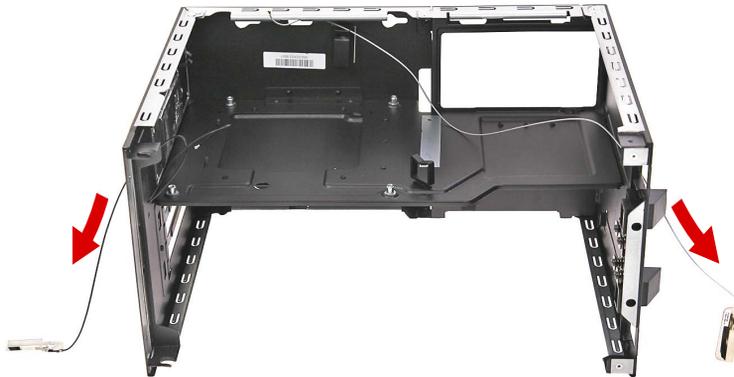
2. Release the WLAN antenna cable from the adhesive tape that secures them to the chassis.



3. Gently peel off the WLAN antenna from the chassis.



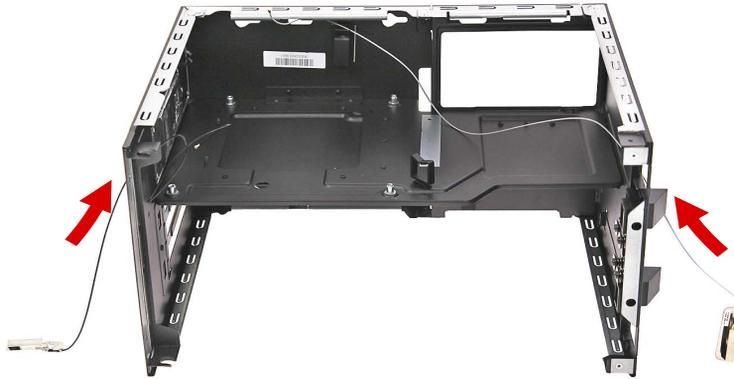
4. Pull and remove the WLAN antenna cables from the chassis.



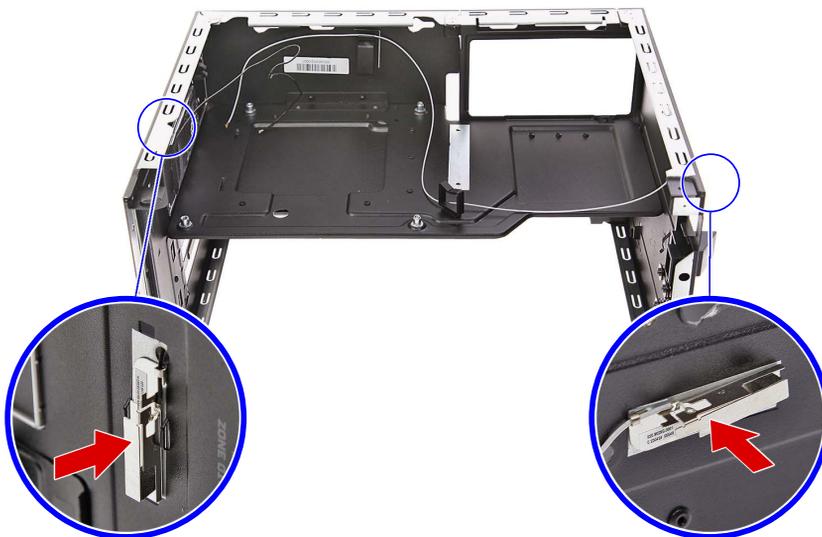
Reassembly Procedures

Reinstalling the WLAN Antenna Cables

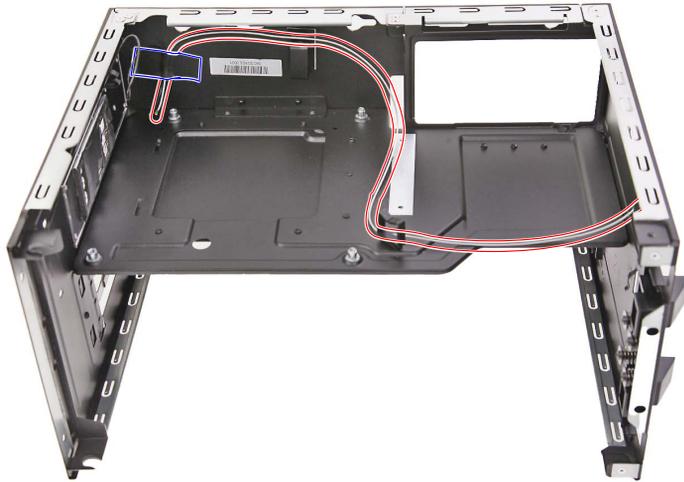
1. Insert the WLAN antenna cables into the chassis.



2. Use double sided adhesive tape to secure the WLAN antenna into the chassis.



-
- Secure the WLAN antenna cable to the chassis using adhesive tape.

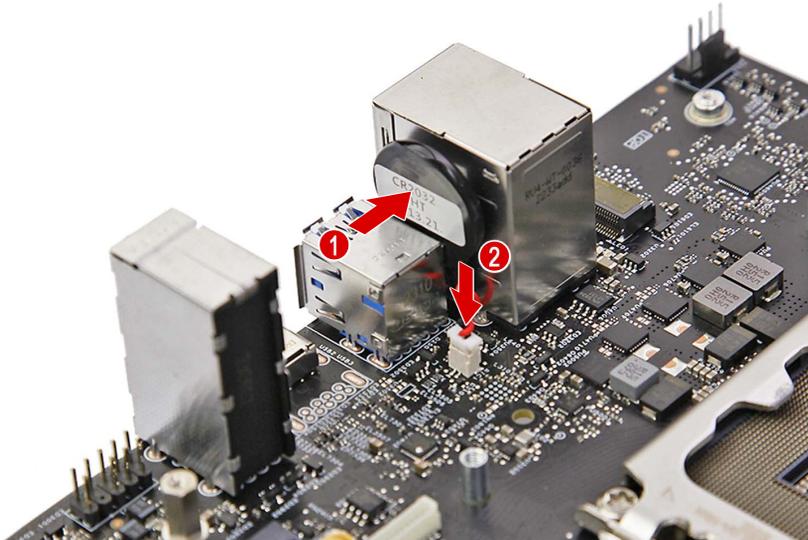


- Insert the WLAN antenna cover into the rear chassis and press it down until it latches into place.



Reinstalling the Mainboard

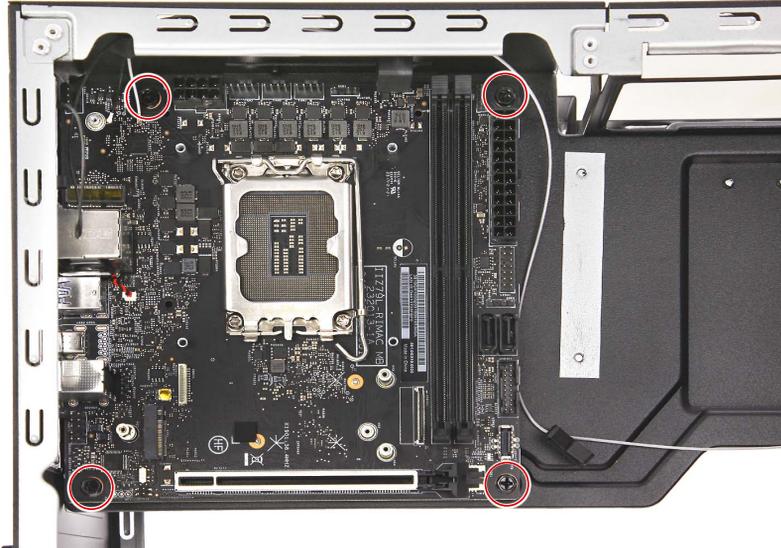
1. Use a double sided tape to secure the RTC battery to the side of the RJ45 connector (1), then connect the RTC battery cable to the mainboard (2).



2. Insert the mainboard towards the rear of the chassis, making sure the I/O ports of the mainboard are extruding from their port holes.

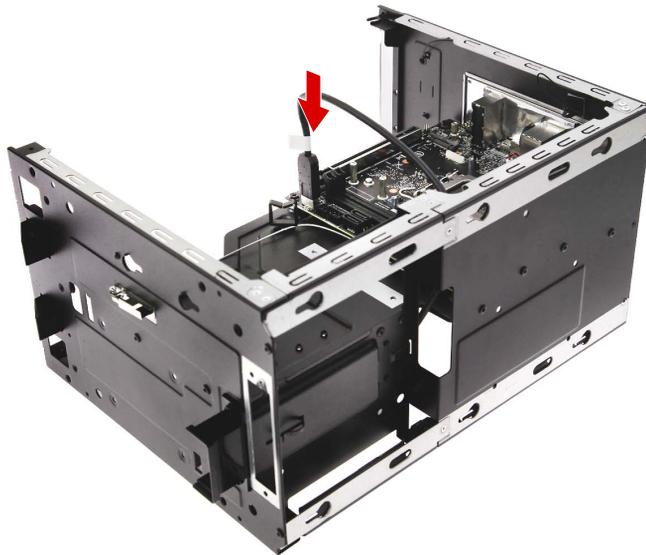


- Secure the mainboard to the chassis using four screws.



Quantity	Color	Torque	Part Number	Screw Type
4	Black	6.0 ± 0.5 kgf-cm	86.B9AD1.001	

- Connect the portable SSD device cable to the mainboard.



Reinstalling the Front I/O Module

1. Insert the front I/O board into the bracket.

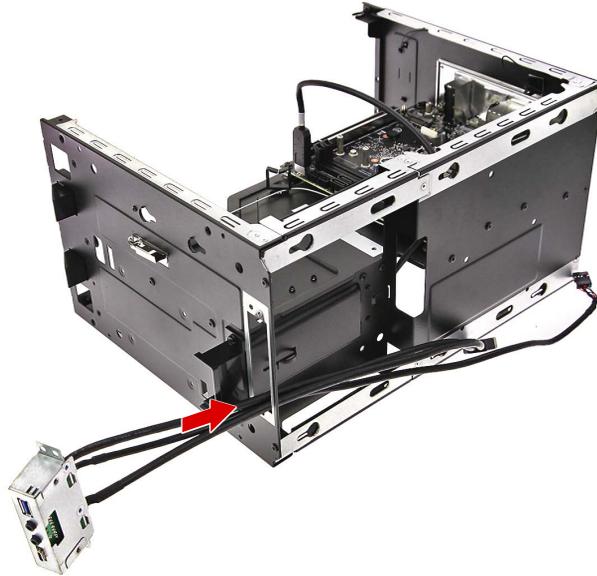


2. Secure the front I/O board to the bracket using two screws.



Quantity	Color	Torque	Part Number	Screw Type
2	Black	1.5 ± 0.2 kgf-cm	86.E3SD1.002	

-
3. Insert the front I/O and audio cables into the chassis.



4. Place the front I/O bracket into the chassis.

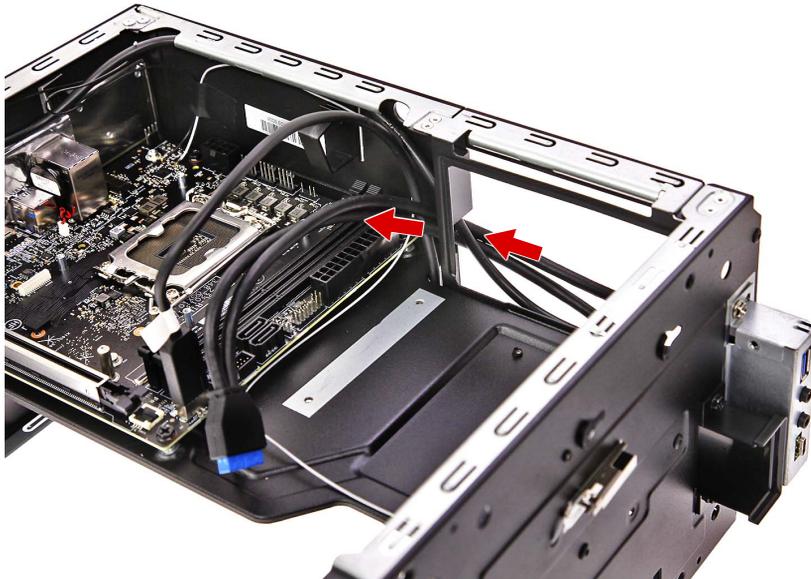


5. Secure the front I/O bracket to the chassis using two screws.

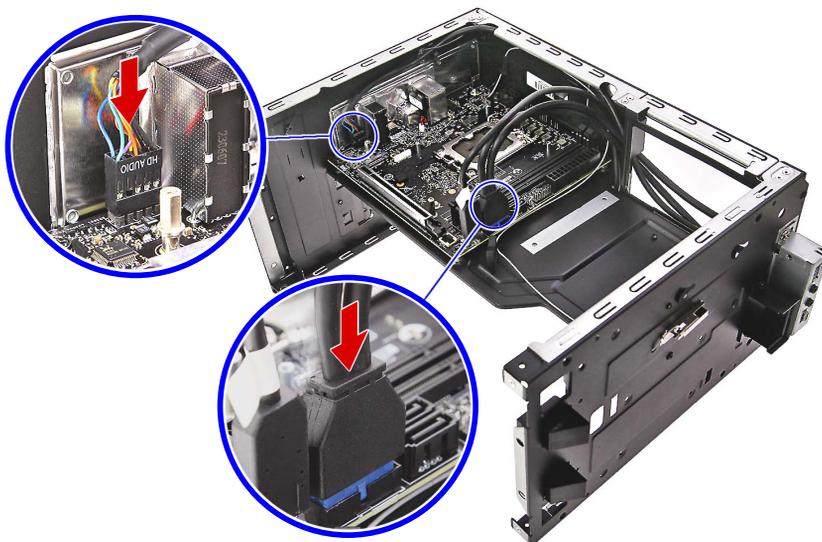


Quantity	Color	Torque	Part Number	Screw Type
2	Black	6.0 ± 0.5 kgf-cm	86.00P64.A686.SR2D 1.0010	

6. Insert the front I/O and audio cables into the chassis.



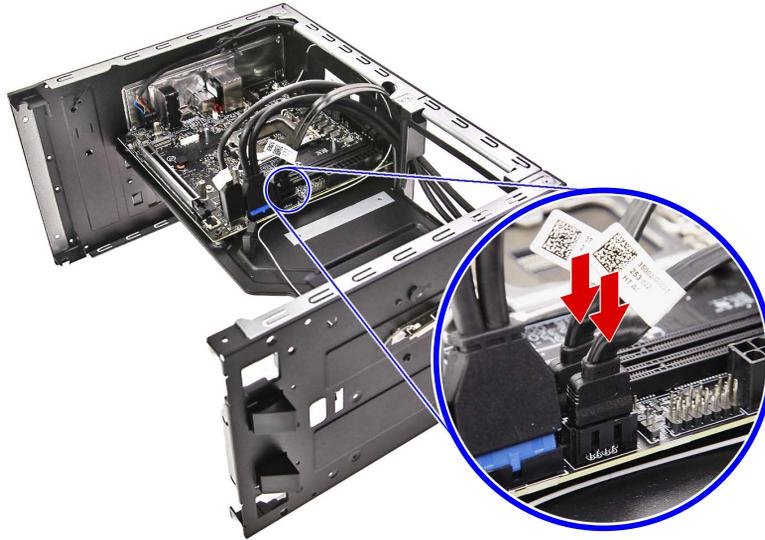
7. Connect the front I/O and audio cables to the mainboard.



Reinstalling the HDD SATA and Power Cables

NOTE: Some Predator Orion X-650 systems will not ship with 2.5-inch HDD modules installed. However, the HDD power and SATA cables are included in the original accessory box.

1. Connect the HDD SATA cables to the mainboard.



2. Connect the HDD power supply cable to the power supply module.

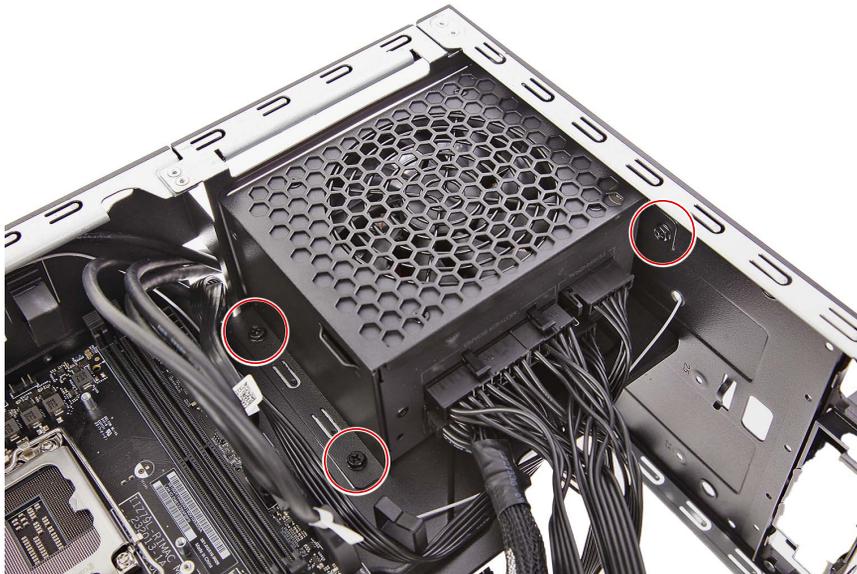


Reinstalling the Power Supply Module

1. Slide the power supply module into its socket in the chassis.

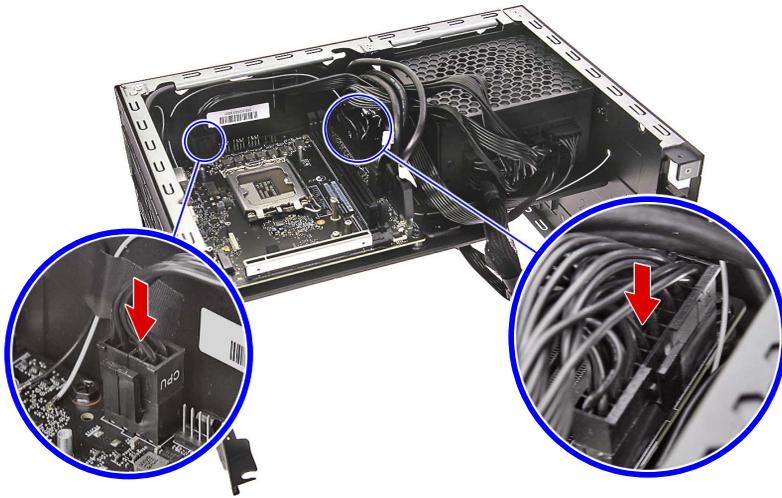


2. Secure the power supply module to the chassis using four screws.



Quantity	Color	Torque	Part Number	Screw Type
3	Black	6.0 ± 0.5 kgf-cm	86.SR2D1.001	

-
3. Connect the power supply cables to the mainboard.

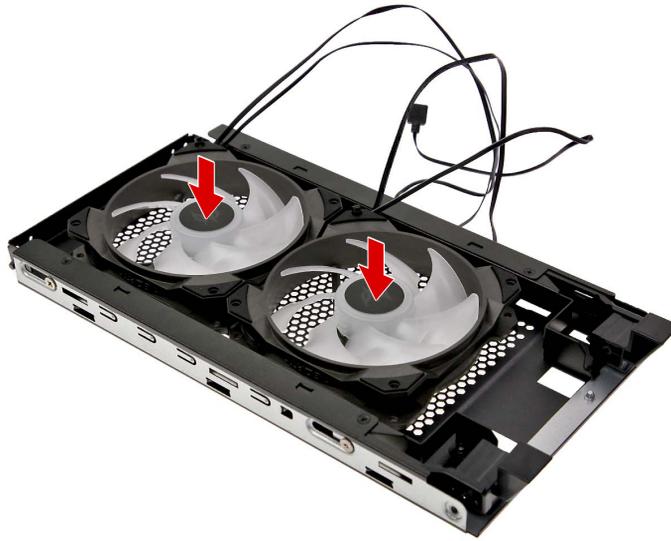


4. Connect the power cable extension to the power supply.

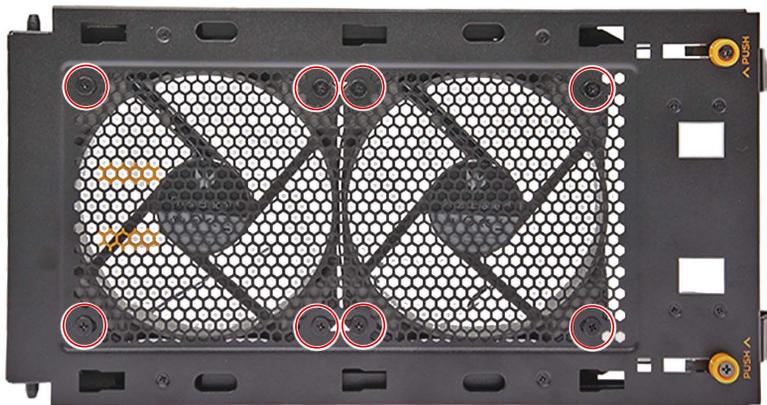


Reinstalling the System Fans

1. Insert the system fans into the upper chassis assembly.

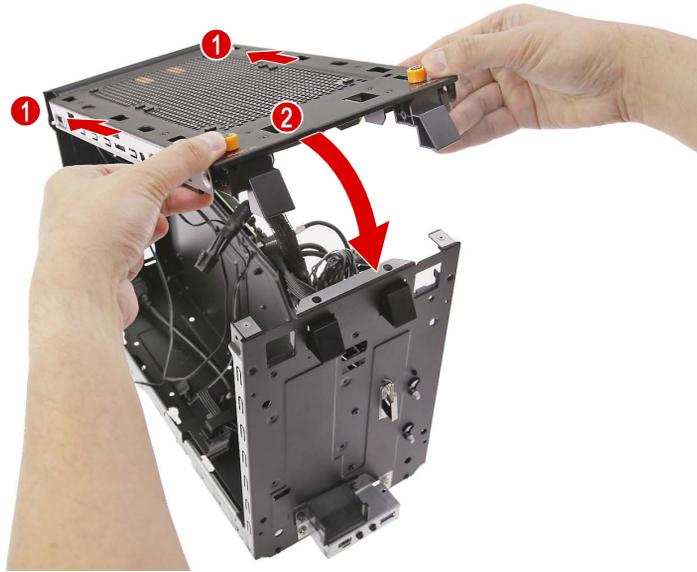


2. Secure the system fans to the upper chassis assembly using eight screws.

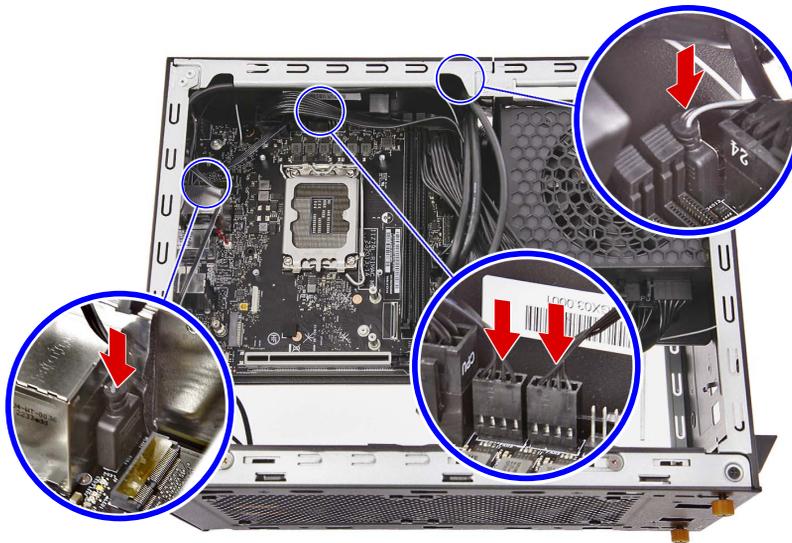


Quantity	Color	Torque	Part Number	Screw Type
8	Black	4.0 ± 0.5 kgf-cm	86.E3SD1.001	

3. Replace the upper chassis assembly and push it down until it latches into place.



4. Connect the system fan power and LED cables to the mainboard.



Reinstalling the PCIe x16 Extension Cable

1. Place the PCIe x16 extension cable into the chassis.



2. Secure the PCIe x16 extension cable to the chassis using two screws.

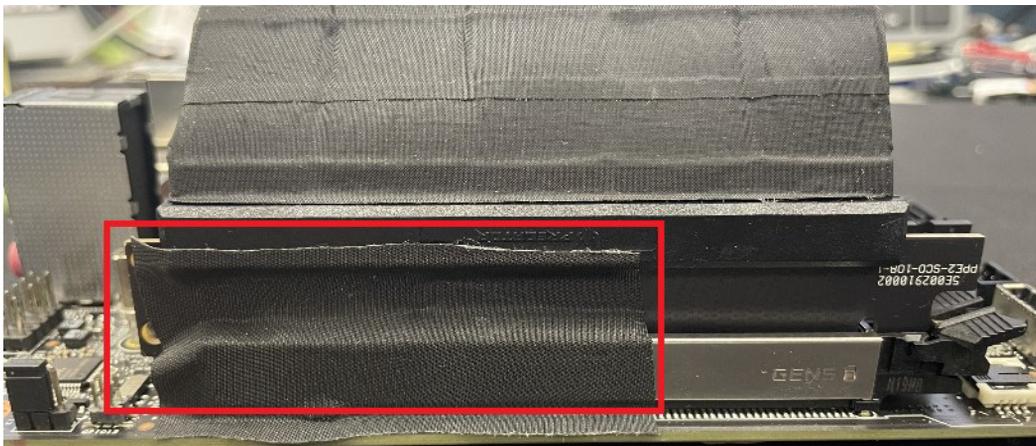


Quantity	Color	Torque	Part Number	Screw Type
2	Black	6.0 ± 0.5 kgf-cm	86.B9AD1.001	

-
3. Connect the PCIe x16 extension cable to the mainboard.



4. Secure the PCIe x16 extension cable using adhesive tape.



Reinstalling the HDD2 Module

1. Place the HDD2 module into the chassis.



2. Secure the HDD2 module to the chassis using four screws.



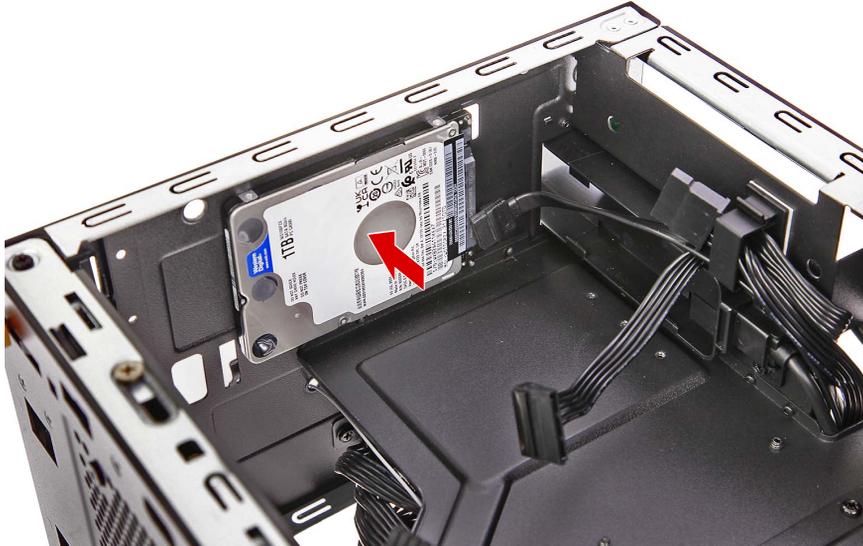
Quantity	Color	Torque	Part Number	Screw Type
4	Silver	4.0 ± 0.3 kgf-cm	86.3A534.4R0	

-
3. Connect the power and data cables to the HDD2 module.



Reinstalling the HDD1 Module

1. Place the HDD1 module into the chassis.

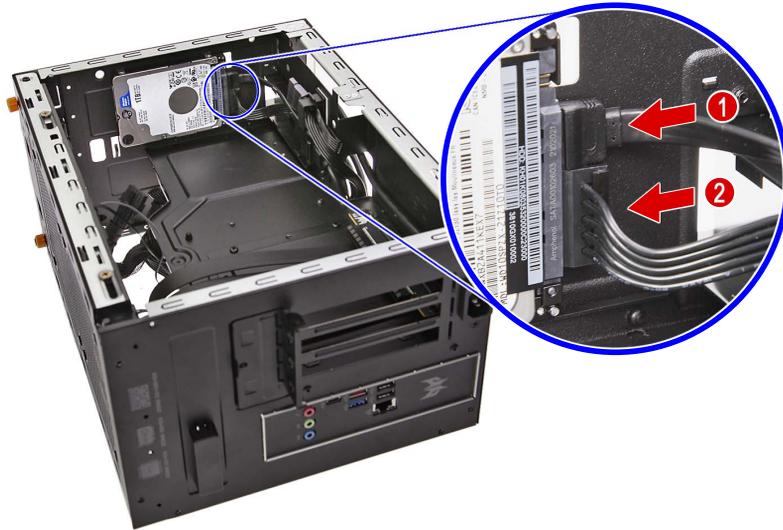


2. Secure the HDD1 module to the chassis using four screws.



Quantity	Color	Torque	Part Number	Screw Type
4	Silver	4.0 ± 0.3 kgf-cm	86.3A534.4R0	

-
3. Connect the power and data cables to the HDD1 module.



Reinstalling the Bottom Cover

1. Place the bottom cover into the chassis.



2. Secure the bottom cover to the chassis two screws.



Quantity	Color	Torque	Part Number	Screw Type
2	Black	4.0 ± 0.5 kgf-cm	N/A	

Reinstalling the Front Bezel

1. Insert the power button/LED cables into the chassis.



2. Push the front bezel into the chassis until the latches lock into place.

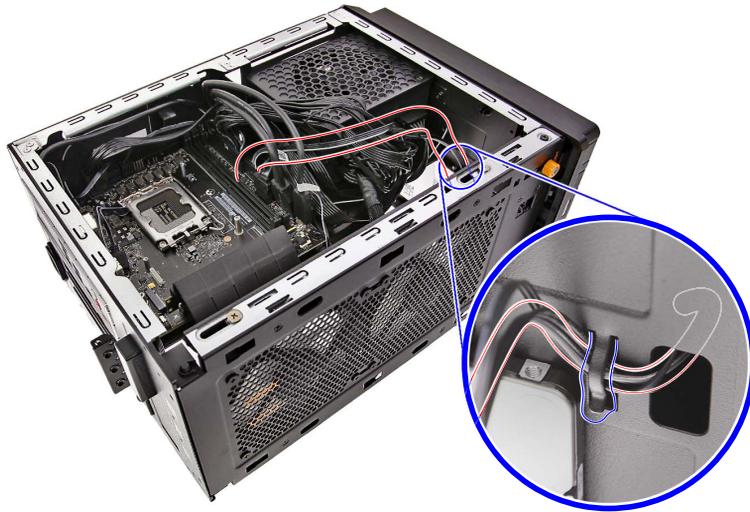


3. Secure the front bezel to the chassis using four screws.



Quantity	Color	Torque	Part Number	Screw Type
4	Black	6.0 ± 0.5 kgf-cm	86.SR2D1.001	

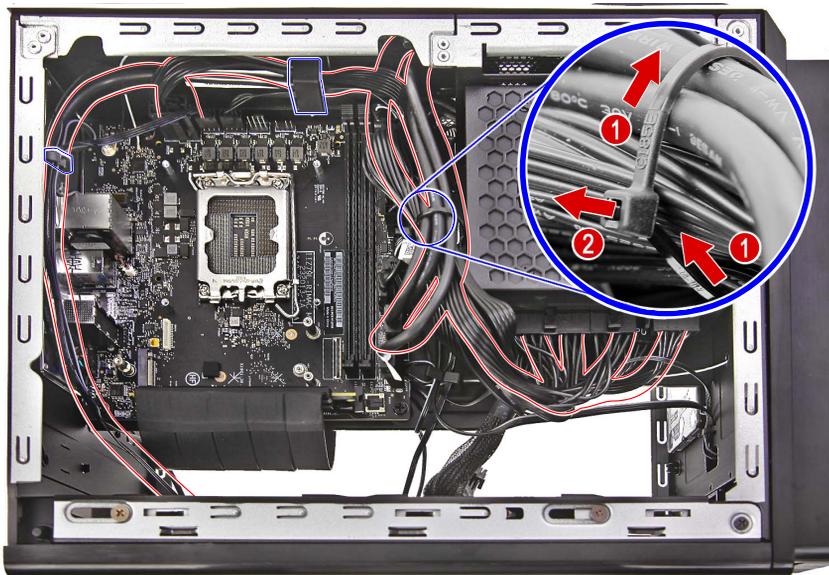
4. Secure the power button/LED cables to the chassis using the metal clip.



-
5. Connect the power button/LED cables to the mainboard.



6. Secure the cables to the chassis using the cable tie and plastic clips.



Reinstalling the Top Cover

1. Place the top cover into the chassis push it towards the front until it latches into place.



2. Secure the top cover to the chassis using two screws.



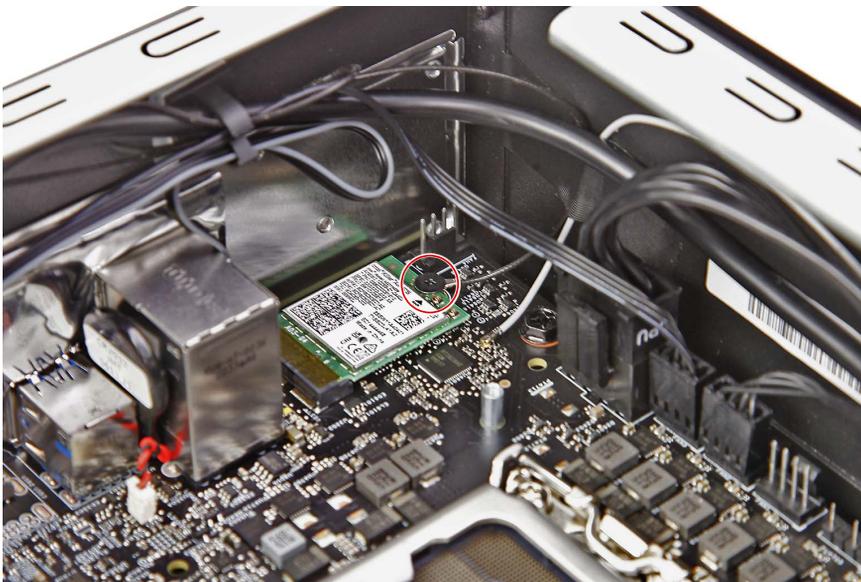
Quantity	Color	Torque	Part Number	Screw Type
2	Black	4.0 ± 0.5 kgf-cm	N/A	

Reinstalling the WLAN Module

1. Insert the WLAN module into its slot in the mainboard.



2. Secure the WLAN module to the mainboard using one screw.



Quantity	Color	Torque	Part Number	Screw Type
1	Black	1.5 ± 0.3 kgf-cm	86.BFZD1.001	

-
3. Connect the WLAN antenna cables to the WLAN module.



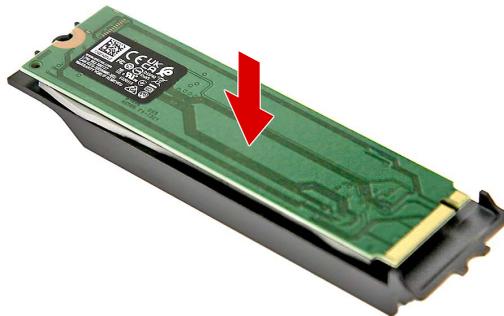
NOTE: Refer to your machine disassembly note to determine which cable color corresponds to the main and auxiliary connectors.

Reinstalling the SSD1 Module

1. Place the thermal pad into the SSD heatsink.



2. Insert the SSD1 module into the SSD heatsink.



3. Insert the SSD1 module into the mainboard.



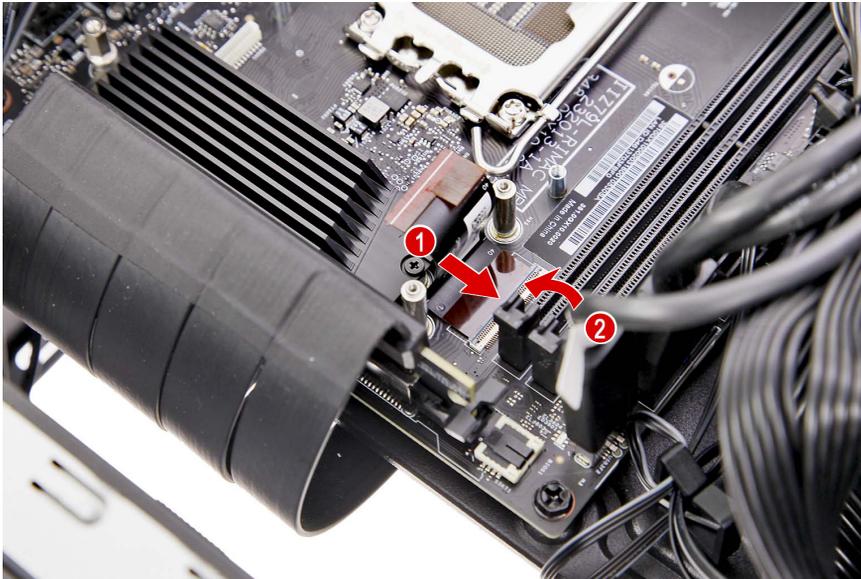
4. Secure the SSD1 module to the mainboard using one screw.



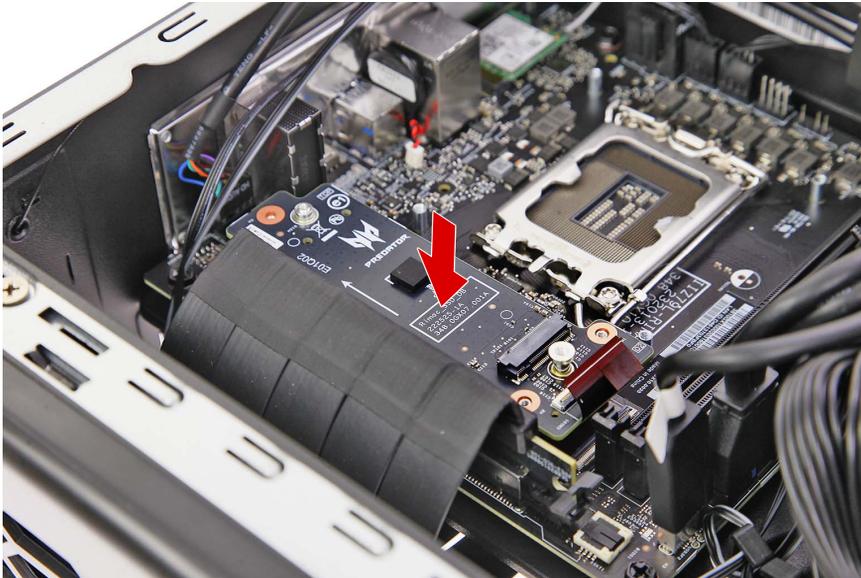
Quantity	Color	Torque	Part Number	Screw Type
1	Black	1.5 ± 0.3 kgf-cm	86.BFZD1.001	

Reinstalling the SSD Board

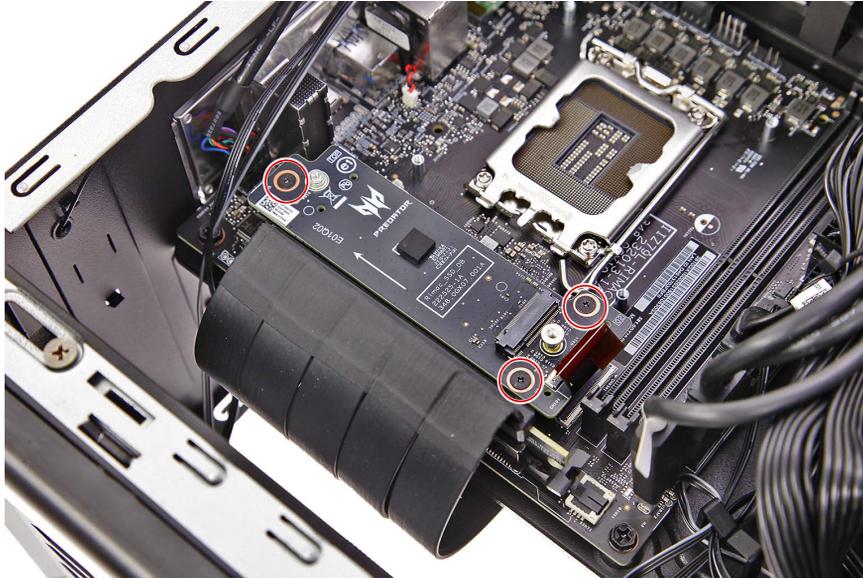
1. Connect the SSD cable to the mainboard.



2. Insert the SSD board into the mainboard.



- Secure the SSD board to the mainboard using three screws.



Quantity	Color	Torque	Part Number	Screw Type
3	Black	1.5 ± 0.2 kgf-cm	86.E3SD1.002	

- Connect the SSD cable to the SSD board.

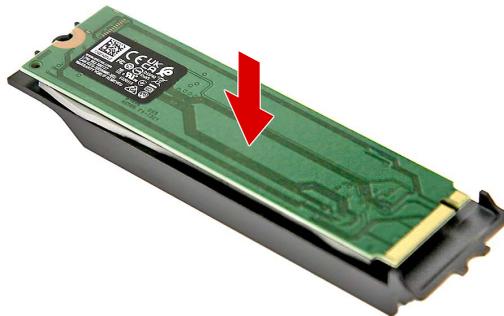


Reinstalling the SSD2 Module

1. Place the thermal pad into the SSD heatsink.



2. Insert the SSD2 module into the SSD heatsink.



3. Insert the SSD2 module into the mainboard.



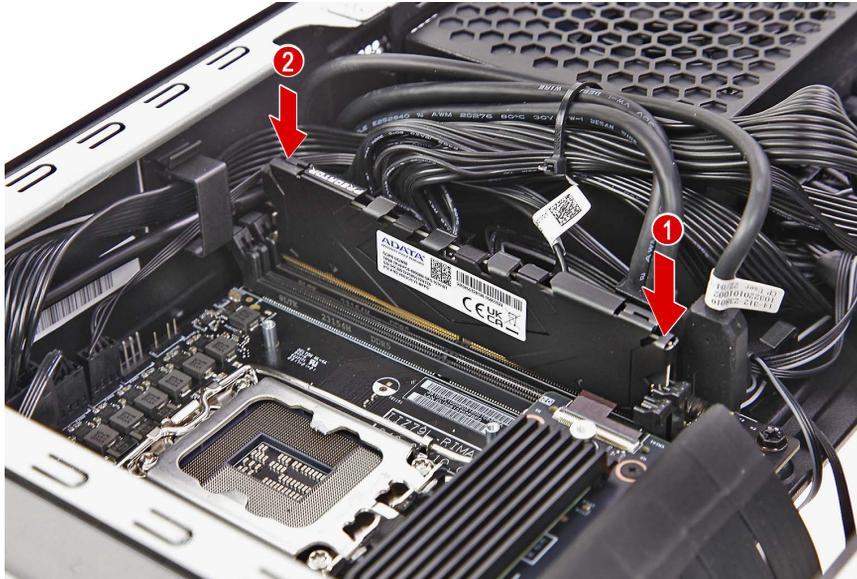
4. Secure the SSD2 module to the mainboard using one screw.



Quantity	Color	Torque	Part Number	Screw Type
1	Black	1.5 ± 0.3 kgf-cm	86.BFZD1.001	

Reinstalling the Memory Modules

1. Insert the memory module into the DIMM slot (1) then press it down until it latches into place (2).



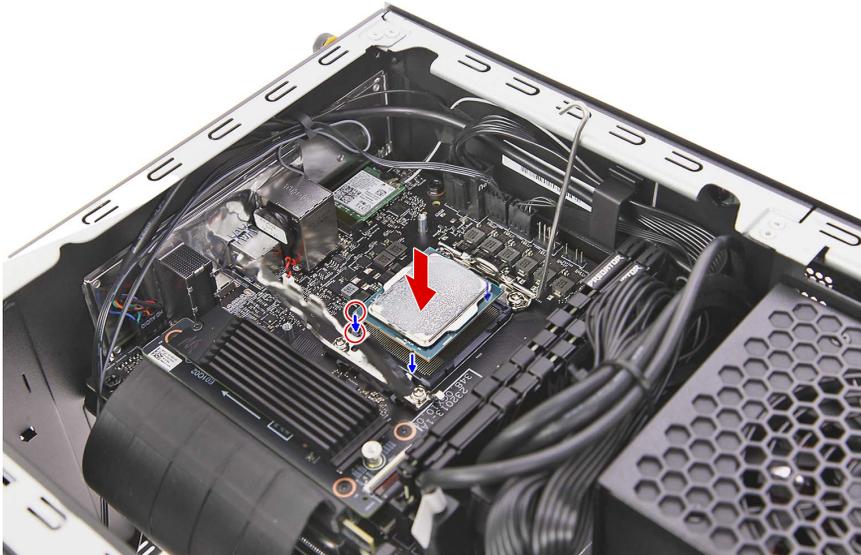
2. Repeat Step 1 to install the other memory module.

IMPORTANT When installing DIMM modules, populate the DIMM slots according to the table below:

Size	DIMM1	DIMM2
8G	8G	N/A
16G	8G	8G
16G	16G	N/A
32G	16G	16G
32G	32G	N/A
64G	32G	32G

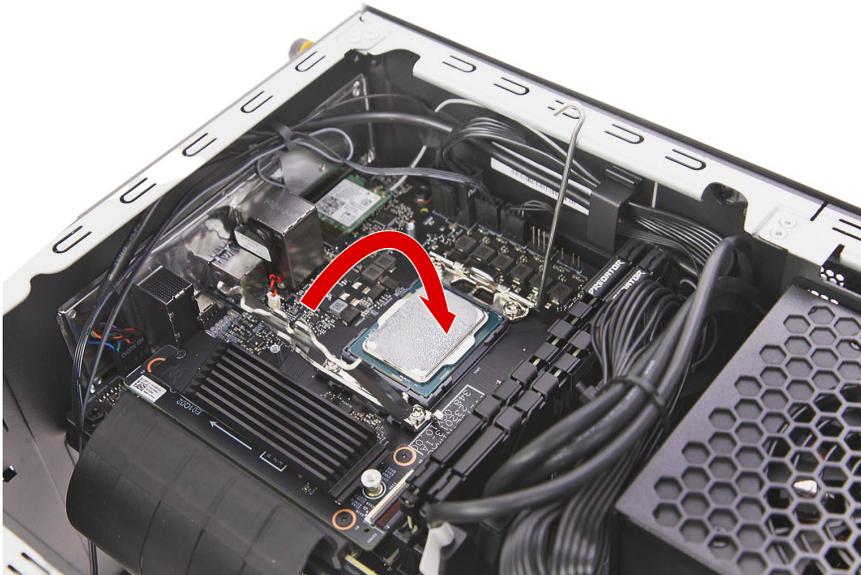
Reinstalling the Processor

1. Place the processor into its socket.

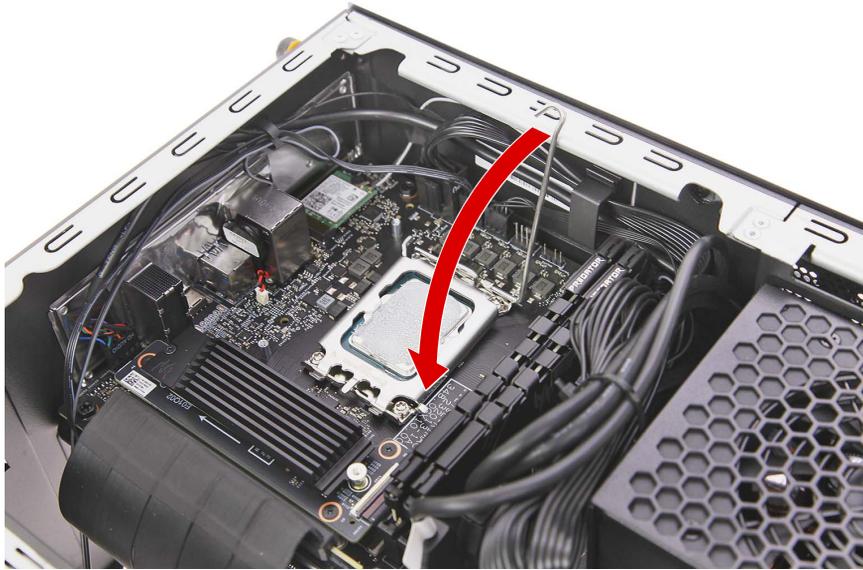


NOTE: Make sure the gold arrow on the corner of the processor is aligned with the beveled corner of the socket. The processor will easily fit into the socket if it is properly oriented.

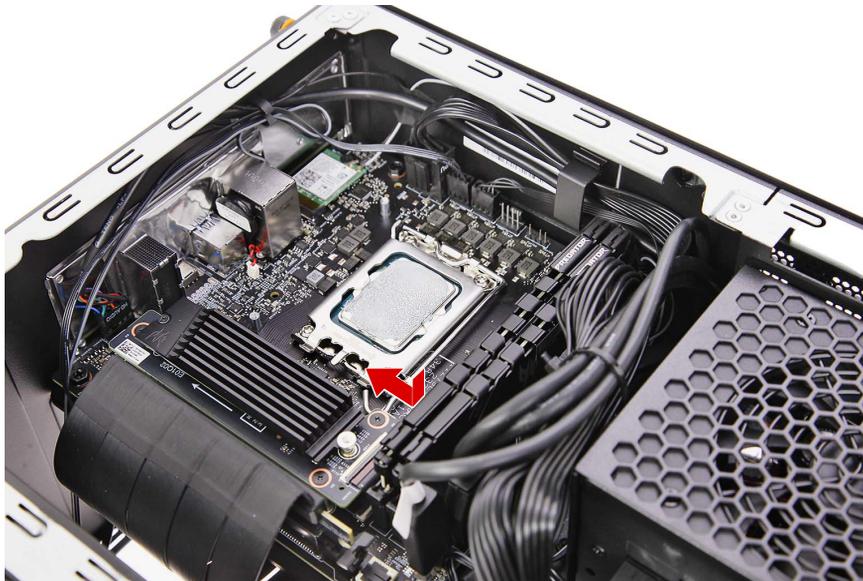
2. Replace the CPU cover plate.



3. Pull down the load lever to secure the processor into its socket.



4. Slide the load lever to the left until it latches into the retention tab.



Reinstalling the Thermal Module

1. Place the thermal module into the mainboard.



2. Tighten the four captive screws to secure the thermal module to the mainboard.



Quantity	Color	Torque	Part Number	Screw Type
4	Silver	6.0 ± 0.5 kgf-cm	N/A	Thermal Screws

-
3. Connect the heatsink fan and LED cables to the mainboard.



Reinstalling the Right Side Panel

1. Insert the right side panel into the right side of the chassis and push until it latches into place.



2. Secure the right side panel to the chassis using two screws.



Quantity	Color	Torque	Part Number	Screw Type
2	Black	4.0 ± 0.5 kgf-cm	N/A	

Reinstalling the Graphics Card

1. Insert the graphics card into the PCIe x16 extension slot, then press it down until it latches into place.



2. Use the metal clip to secure the graphics card bracket to the chassis.



- Secure the graphics card brackets to the chassis using three screws.



Quantity	Color	Torque	Part Number	Screw Type
3	Black	6.0 ± 0.5 kgf-cm	86.SR2D1.001	

- Connect the power cable to the graphics card.



Reinstalling the Left Side Panel

1. Insert the left side panel into the left side of the chassis and push until it latches into place.



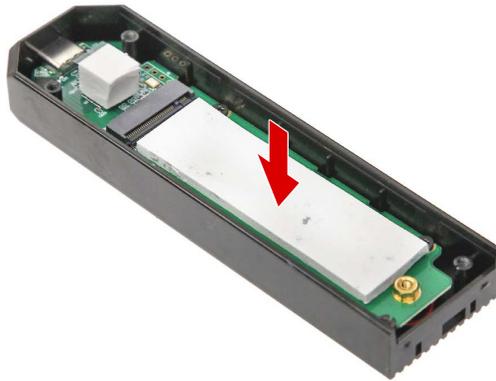
2. Secure the left side panel to the chassis using two screws.



Quantity	Color	Torque	Part Number	Screw Type
2	Black	4.0 ± 0.5 kgf-cm	N/A	

Reinstalling the Portable SSD Device

1. Insert the thermal pad into the portable SSD device.



2. Insert the SSD module into the portable SSD device.

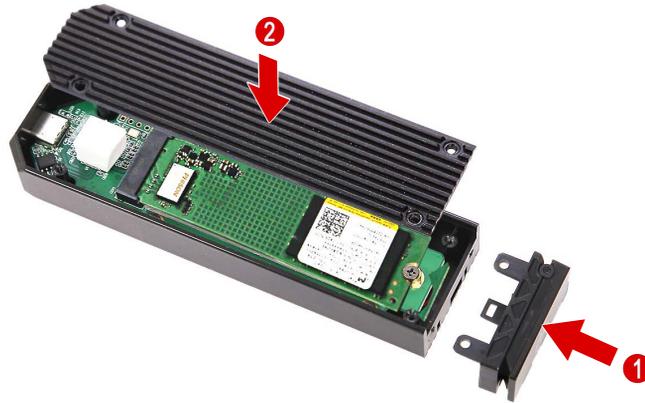


3. Secure the SSD module to the portable SSD device using one screw.



Quantity	Color	Torque	Part Number	Screw Type
1	Black	1.5 ± 0.3 kgf-cm	N/A	

- Replace the top and front cover of the portable SSD device.



- Secure the portable SSD device cover using four screws.



Quantity	Color	Torque	Part Number	Screw Type
4	Black	1.5 ± 0.2 kgf-cm	N/A	

- Insert the portable SSD device in its slot and push it until it latches into place.



Troubleshooting

This chapter provides instructions on how to troubleshoot system hardware problems.

Hardware Diagnostic Procedure

IMPORTANT The diagnostic tests described in this chapter are only intended to test Acer products. Non-Acer products, prototype cards, or modified options can give false errors and invalid system responses.

1. Obtain the failing symptoms in as much detail as possible.
2. Verify the symptoms by attempting to recreate the failure by running the diagnostic tests or repeating the same operation.
3. Refer to “Power System Check” and “LED Codes” to determine which corrective action to perform.

System Check Procedures

Power System Check

If the system can be powered on, skip this section. Proceed to the “System Internal Inspection” procedure on the next page.

If the system will not power on, do the following:

- Check if the power cable is properly connected to the AC power jack and a functional AC power source.
- Check if the voltage selector switch is set to the correct voltage setting.

System External Inspection

1. Inspect the power and LED indicators on the front panel. Go to “Front View” section on page 3 for the location and description of the LED behaviour.
2. Make sure that the ventilation slots on the rear panel are not blocked.
3. Make sure that there is no point of contact in the system that can cause a power short.
4. If the cause of the failure is still can not be determined, perform the “System Internal Inspection” procedure described on the next page.

System Internal Inspection

1. Turn off the power to the computer and all peripherals.
2. Unplug the power cord from the computer.
3. Unplug the network cable and all connected peripheral devices from the computer.
4. Place the computer on a flat, steady surface.
5. Remove the side panel as described in page 24.
6. Verify that the processor, memory module(s), and expansion board(s) are properly seated.
7. Verify that all power and data cables are firmly and properly attached to the installed drives.
8. Verify that all cable connections inside the system are firmly and properly attached to their appropriate mainboard connectors.
9. Verify that all components are Acer-qualified and supported.
10. Reinstall the side panel.
11. Power on the system.

If the cause of the failure is still can not be determined, review the POST messages and BIOS checkpoints during the system startup.

Checkpoints

A checkpoint is either a byte or word value output to I/O port 80h. The BIOS outputs checkpoints during bootblock and Power-On Self Test (POST) to indicate the task the system is currently executing. Checkpoints are very useful in aiding software developers or technicians in debugging problems that occur during the pre-boot process.

Viewing BIOS Checkpoints

Viewing all checkpoints generated by the BIOS requires a checkpoint card, also referred to as a POST card or POST diagnostic card. These are ISA or PCI add-in cards that show the value of I/O port 80h on a LED display. Checkpoints may appear on the bottom right corner of the screen during POST. This display method is limited, since it only displays checkpoints that occur after the video card has been activated.

NOTE: Please note that checkpoints may differ between different platforms based on system configuration. Checkpoints may change due to vendor requirements, system chipset or option ROMs from add-in PCI devices.

Boot Block Initialization Code Checkpoints

The boot block initialization code sets up the chipset, memory, and other components before system memory is available. The following table describes the type of checkpoints that may occur during the boot block initialization portion of the BIOS.

Checkpoint	Description
Before D1	Early chipset initialization is done. Early super I/O initialization is done including RTC and keyboard controller. NMI is disabled.
D1	Perform keyboard controller BAT test. Check if waking up from power management suspend state. Save power-on CPUID value in scratch CMOS.
D0	Go to flat mode with 4GB limit and GA20 enabled. Verify the bootblock checksum.
D2	Disable CACHE before memory detection. Execute full memory sizing module. Verify that flat mode is enabled.
D3	If memory sizing module not executed, start memory refresh and do memory sizing in bootblock code. Do additional chipset initialization. Re-enable CACHE. Verify that flat mode is enabled.
D4	Test base 512 KB memory. Adjust policies and cache first 8 MB. Set stack.
D5	Bootblock code is copied from ROM to lower system memory and control is given to it. BIOS now executes out of RAM.

Checkpoint	Description
D6	Both key sequence and OEM specific method is checked to determine if BIOS recovery is forced. Main BIOS checksum is tested. If BIOS recovery is necessary, control flows to checkpoint E0. See the "BIOS Recovery" section for more information.
D7	Restore CPUID value back into register. The Bootblock Runtime interface module is moved to system memory and control is given to it. Determine whether to execute serial flash.
D8	The Runtime module is uncompressed into memory. CPUID information is stored in memory.
D9	Store the Uncompressed pointer for future use in PMM. Copying Main BIOS into memory. Leaves all RAM below 1 MB Read-Write including E000 and F000 shadow areas but closing SMRAM.
DA	Restore CPUID value back into register. Give control to BIOS POST (ExecutePOSTKernel). See the "POST Code Checkpoints" section for more information.

Boot Block Recovery Code Checkpoints

The boot block recovery code gets control when the BIOS determines that a BIOS recovery is required because the user has forced the update or the BIOS checksum is corrupt. Refer to "BIOS Recovery" section on page 128 for more information. The following table describes the type of checkpoints that may occur during the boot block recovery portion of the BIOS.

Checkpoint	Description
E0	Initialize the floppy controller in the super I/O. Some interrupt vectors are initialized. DMA controller is initialized. 8259 interrupt controller is initialized. L1 cache is enabled.
E9	Set up floppy controller and data. Attempt to read from floppy.
EA	Enable ATAPI hardware. Attempt to read from ARMD and ATAPI CDROM.
EB	Disable ATAPI hardware. Jump back to checkpoint E9.
EF	Read error occurred on media. Jump back to checkpoint EB.
E9 or EA	Determine information about root directory of recovery media.
F0	Search for pre-defined recovery file name in root directory.
F1	Recovery file not found.
F2	Start reading FAT table and analyze FAT to find the clusters occupied by the recovery file.
F3	Start reading the recovery file cluster by cluster.
F5	Disable L1 cache.
FA	Check the validity of the recovery file configuration to the current configuration of the flash part.
FB	Make flash write enabled through chipset and OEM specific method. Detect proper flash part. Verify that the found flash part size equals the recovery file size.
F4	The recovery file size does not equal the found flash part size.
FC	Erase the flash part.
FD	Program the flash part.
FF	The flash has been updated successfully. Make flash write disabled. Disable ATAPI hardware. Restore CPUID value back into register. Give control to F000 ROM at F000:FFF0h.

POST Code Checkpoints

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

Checkpoint	Description
03	Disable NMI, Parity, video for EGA, and DMA controllers. Initialize BIOS, POST, Runtime data area. Also initialize BIOS modules on POST entry and GPNV area. Initialized CMOS as mentioned in the Kernel Variable wCMOSFlags.
04	Check CMOS diagnostic byte to determine if battery power is OK and CMOS checksum is OK. Verify CMOS checksum manually by reading storage area. If the CMOS checksum is bad, update CMOS with power-on default values and clear passwords. Initialize status register A. Initializes data variables that are based on CMOS setup questions. Initializes both the 8259 compatible PICs in the system
05	Initializes the interrupt controlling hardware (generally PIC) and interrupt vector table.
06	Do R/W test to CH-2 count reg. Initialize CH-0 as system timer. Install the POSTINT1Ch handler. Enable IRQ-0 in PIC for system timer interrupt. Traps INT1Ch vector to POSTINT1ChHandlerBlock.
08	Initializes the CPU. The BAT test is being done on KBC. Program the keyboard controller command byte is being done after Auto detection of KB/MS using AMI KB-5.
0A	Initializes the 8042 compatible Key Board Controller.
0B	Detects the presence of PS/2 mouse.
0C	Detects the presence of Keyboard in KBC port.
0E	Testing and initialization of different Input Devices. Also, update the Kernel Variables. Traps the INT09h vector, so that the POST INT09h handler gets control for IRQ1. Uncompress all available language, BIOS logo, and Silent logo modules.
13	Early POST initialization of chipset registers.
24	Uncompress and initialize any platform specific BIOS modules. GPNV is initialized at this checkpoint.
30	Initialize System Management Interrupt.
2A	Initializes different devices through DIM. See DIM Code Checkpoints section for more information.
2C	Initializes different devices. Detects and initializes the video adapter installed in the system that have optional ROMs.
2E	Initializes all the output devices.
31	Allocate memory for ADM module and uncompress it. Give control to ADM module for initialization. Initialize language and font modules for ADM. Activate ADM module.
33	Initializes the silent boot module. Set the window for displaying text information.
37	Displaying sign-on message, CPU information, setup key message, and any OEM specific information.
38	Initializes different devices through DIM. See DIM Code Checkpoints section for more information. USB controllers are initialized at this point.
39	Initializes DMAC-1 & DMAC-2.
3A	Initialize RTC date/time.
3B	Test for total memory installed in the system. Also, Check for DEL or ESC keys to limit memory test. Display total memory in the system.
3C	Mid POST initialization of chipset registers.
40	Detect different devices (Parallel ports, serial ports, and coprocessor in CPU, ... etc.) successfully installed in the system and update the BDA, EBDA...etc.

Checkpoint	Description
50	Programming the memory hole or any kind of implementation that needs an adjustment in system RAM size if needed.
52	Updates CMOS memory size from memory found in memory test. Allocates memory for Extended BIOS Data Area from base memory. Programming the memory hole or any kind of implementation that needs an adjustment in system RAM size if needed.
60	Initializes Num-Lock status and programs the KBD typematic rate.
75	Initialize Int-13 and prepare for IPL detection.
78	Initializes IPL devices controlled by BIOS and option ROMs.
7A	Initializes remaining option ROMs.
7C	Generate and write contents of ESCD in NVRam.
84	Log errors encountered during POST.
85	Display errors to the user and gets the user response for error.
87	Execute BIOS setup if needed / requested. Check boot password if installed.
8C	Late POST initialization of chipset registers.
8E	Program the peripheral parameters. Enable/Disable NMI as selected.
90	Late POST initialization of system management interrupt.
A0	Check boot password if installed.
A1	Clean-up work needed before booting to OS.
A2	Takes care of runtime image preparation for different BIOS modules. Fill the free area in F000h segment with 0FFh. Initializes the Microsoft IRQ Routing Table. Prepares the runtime language module. Disables the system configuration display if needed.
A4	Initialize runtime language module. Display boot option popup menu.
A7	Displays the system configuration screen if enabled. Initialize the CPU's before boot, which includes the programming of the MTRR's.
A8	Prepare CPU for OS boot including final MTRR values.
A9	Wait for user input at config display if needed.
AA	Uninstall POST INT1Ch vector and INT09h vector. Deinitializes the ADM module.
AB	Prepare BBS for Int 19 boot.
AC	End of POST initialization of chipset registers.
B1	Save system context for ACPI.
00	Passes control to OS Loader (typically INT19h).

DIM Code Checkpoints

The Device Initialization Manager (DIM) gets control at various times during BIOS POST to initialize different system busses. The following table describes the main checkpoints where the DIM module is accessed.

Checkpoint	Description
2A	Initialize different buses and perform the following functions: Reset, Detect, and Disable (function 0); Static Device Initialization (function 1); Boot Output Device Initialization (function 2). Function 0 disables all device nodes, PCI devices, and PnP ISA cards. It also assigns PCI bus numbers. Function 1 initializes all static devices that include manual configured onboard peripherals, memory and I/O decode windows in PCI-PCI bridges, and noncompliant PCI devices. Static resources are also reserved. Function 2 searches for and initializes any PnP, PCI, or AGP video devices.
38	Initialize different buses and perform the following functions: Boot Input Device Initialization (function 3); IPL Device Initialization (function 4); General Device Initialization (function 5). Function 3 searches for and configures PCI input devices and detects if system has standard keyboard controller. Function 4 searches for and configures all PnP and PCI boot devices. Function 5 configures all onboard peripherals that are set to an automatic configuration and configures all remaining PnP and PCI devices.

POST Error Indicators

When a system error is detected during POST (Power On Self Test), the Setup utility will switch to diagnostic mode and will either:

- Displays a POST error message, or
- Emits a series of beep codes

POST Error Messages

POST error messages tell users what failure the system has detected. Some error messages could be related to a hardware device. Others may indicate a problem with a device configuration. In some cases an error message may include recommendations for troubleshooting or require that you press the **Enter** key to display recommendations. Follow the instructions on the screen. It is recommended that you correct the error before proceeding, even if the computer appears to boot successfully.

IMPORTANT: If your system fails after you make changes in the Setup menus, reboot the computer, enter Setup again and load Setup defaults to correct the error.

Memory

Message	Description
Gate20 Error	The BIOS is unable to properly control the mainboard's Gate A20 function, which controls access of memory over 1 MB. This may indicate a problem with the mainboard.
Multi-Bit ECC Error	This message will only occur on systems using ECC enabled memory modules. ECC memory has the ability to correct single-bit errors that may occur from faulty memory modules. A multiple bit corruption of memory has occurred, and the ECC memory algorithm cannot correct it. This may indicate a defective memory module.
Parity Error	Fatal Memory Parity Error. System halts after displaying this message.
RAM R/W test failed	This message is displayed by the AMIBIOS8 when the RAM read/write test fails.
CMOS Memory Size Wrong	The base memory (memory below 1MB) size that is reported in the CMOS (offset 15h) mismatches with the actual size detected. This condition may occur when the hole is set at 512K base memory or when CMOS is corrupted.

Boot

Message	Description
Boot Failure...	This is a generic message indicating the BIOS could not boot from a particular device. This message is usually followed by other information concerning the device.
Invalid Boot Diskette	A diskette was found in the drive, but it is not configured as a bootable diskette.
Drive Not Ready	The BIOS was unable to access the drive because it indicated it was not ready for data transfer. This is often reported by drives when no media is present.
A: Drive Error	The BIOS attempted to configure the A: drive during POST, but was unable to properly configure the device. This may be due to a bad cable or faulty diskette drive.
B: Drive Error	The BIOS attempted to configure the B: drive during POST, but was unable to properly configure the device. This may be due to a bad cable or faulty diskette drive.
Insert BOOT diskette in A:	The BIOS attempted to boot from the A: drive, but could not find a proper boot diskette. Reboot and Select proper Boot device or Insert Boot Media in selected Boot device BIOS could not find a bootable device in the system and/or removable media drive does not contain media.
Reboot and select proper boot device or Insert boot media in selected boot device	BIOS could not find a bootable device in the system and/or removable media drive does not contain media.
NO ROM BASIC	This message occurs on some systems when no bootable device can be detected.

Storage Device

Message	Description
Primary Master Hard Disk Error	The IDE/ATAPI device configured as Primary Master could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
Primary Slave Hard Disk Error	The IDE/ATAPI device configured as Primary Slave could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
Secondary Master Hard Disk Error	The IDE/ATAPI device configured as Secondary Master could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.

Message	Description
Secondary Slave Hard Disk Error	The IDE/ATAPI device configured as Secondary Slave could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
3rd Master Hard Disk Error	The IDE/ATAPI device configured as Master in the 3rd IDE controller could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
3rd Slave Hard Disk Error	The IDE/ATAPI device configured as Slave in the 3rd IDE controller could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
4th Master Hard Disk Error	The IDE/ATAPI device configured as Master in the 4th IDE controller could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
4th Slave Hard Disk Error	The IDE/ATAPI device configured as Slave in the 4th IDE controller could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
5th Master Hard Disk Error	The IDE/ATAPI device configured as Master in the 5th IDE controller could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
5th Slave Hard Disk Error	The IDE/ATAPI device configured as Slave in the 5th IDE controller could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
6th Master Hard Disk Error	The IDE/ATAPI device configured as Master in the 6th IDE controller could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
6th Slave Hard Disk Error	The IDE/ATAPI device configured as Slave in the 6th IDE controller could not be properly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
Primary Master Drive - ATAPI Incompatible	The IDE/ATAPI device configured as Primary Master failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
Primary Slave Drive - ATAPI Incompatible	The IDE/ATAPI device configured as Primary Slave failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
Secondary Master Drive - ATAPI Incompatible	The IDE/ATAPI device configured as Secondary Master failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
Secondary Slave Drive - ATAPI Incompatible	The IDE/ATAPI device configured as Secondary Slave failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
3rd Master Drive - ATAPI Incompatible	The IDE/ATAPI device configured as Master in the 3rd IDE controller failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
3rd Slave Drive - ATAPI Incompatible	The IDE/ATAPI device configured as Slave in the 3rd IDE controller failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
4th Master Drive - ATAPI Incompatible	The IDE/ATAPI device configured as Master in the 4th IDE controller failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
4th Slave Drive - ATAPI Incompatible	The IDE/ATAPI device configured as Slave in the 4th IDE controller failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.

Message	Description
5th Master Drive - ATAPI Incompatible	The IDE/ATAPI device configured as Master in the 5th IDE controller failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
5th Slave Drive - ATAPI Incompatible	The IDE/ATAPI device configured as Slave in the 5th IDE controller failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
6th Master Drive - ATAPI Incompatible	The IDE/ATAPI device configured as Master in the 6th IDE controller failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
6th Slave Drive - ATAPI Incompatible	The IDE/ATAPI device configured as Slave in the 6th IDE controller failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.
S.M.A.R.T. Capable but Command Failed	The BIOS tried to send a S.M.A.R.T. message to a hard disk, but the command transaction failed. This message can be reported by an ATAPI device using the S.M.A.R.T. error reporting standard. S.M.A.R.T. failure messages may indicate the need to replace the hard disk.
S.M.A.R.T. Command Failed	The BIOS tried to send a S.M.A.R.T. message to a hard disk, but the command transaction failed. This message can be reported by an ATAPI device using the S.M.A.R.T. error reporting standard. S.M.A.R.T. failure messages may indicate the need to replace the hard disk.
S.M.A.R.T. Status BAD, Backup and Replace	A S.M.A.R.T. capable hard disk sends this message when it detects an imminent failure. This message can be reported by an ATAPI device using the S.M.A.R.T. error reporting standard. S.M.A.R.T. failure messages may indicate the need to replace the hard disk.
S.M.A.R.T. Capable and Status BAD	A S.M.A.R.T. capable hard disk sends this message when it detects an imminent failure. This message can be reported by an ATAPI device using the S.M.A.R.T. error reporting standard. S.M.A.R.T. failure messages may indicate the need to replace the hard disk.

Virus-related

Message	Description
BootSector Write!!	The BIOS has detected software attempting to write to a drive's boot sector. This is flagged as possible virus activity. This message will only be displayed if Virus Detection is enabled in AMIBIOS setup.
VIRUS: Continue (Y/N)?	If the BIOS detects possible virus activity, it will prompt the user. This message will only be displayed if Virus Detection is enabled in AMIBIOS setup.

System Configuration

Message	Description
DMA-1 Error	Error initializing primary DMA controller. This is a fatal error, often indication a problem with system hardware.
DMA-2 Error	Error initializing secondary DMA controller. This is a fatal error, often indication a problem with system hardware.
DMA Controller Error	POST error while trying to initialize the DMA controller. This is a fatal error, often indication a problem with system hardware.
Checking NVRAM... Update Failed	BIOS could not write to the NVRAM block. This message appears when the FLASH part is write-protected or if there is no FLASH part (System uses a PROM or EPROM).
Microcode Error	BIOS could not find or load the CPU Microcode Update to the CPU. This message only applies to INTEL CPUs. The message is most likely to appear when a brand new CPU is installed in a mainboard with an outdated BIOS. In this case, the BIOS must be updated to include the Microcode Update for the new CPU.
NVRAM Checksum Bad, NVRAM Cleared	There was an error in while validating the NVRAM data. This causes POST to clear the NVRAM data.
Resource Conflict	More than one system device is trying to use the same non-shareable resources (Memory or I/O).
NVRAM Ignored	The NVRAM data used to store Plug'n'Play (PnP) data was not used for system configuration in POST.
NVRAM Bad	The NVRAM data used to store Plug'n'Play (PnP) data was not used for system configuration in POST due to a data error.
Static Resource Conflict	Two or more Static Devices are trying to use the same resource space (usually Memory or I/O).
PCI I/O conflict	A PCI adapter generated an I/O resource conflict when configured by BIOS POST.
PCI ROM conflict	A PCI adapter generated an I/O resource conflict when configured by BIOS POST.
PCI IRQ conflict	A PCI adapter generated an I/O resource conflict when configured by BIOS POST.
PCI IRQ routing table error	BIOS POST (DIM code) found a PCI device in the system but was unable to figure out how to route an IRQ to the device. Usually this error is causing by an incomplete description of the PCI Interrupt Routing of the system.
Timer Error	Indicates an error while programming the count register of channel 2 of the 8254 timer. This may indicate a problem with system hardware.
Refresh timer test failed	BIOS POST found that the refresh timer hardware failed to pass the Refresh Retrace Test.
Interrupt Controller-1 error	BIOS POST could not initialize the Master Interrupt Controller. This may indicate a problem with system hardware.
Interrupt Controller-2 error	BIOS POST could not initialize the Slave Interrupt Controller. This may indicate a problem with system hardware.

CMOS

Message Displayed	Description
CMOS Date/Time Not Set	The CMOS date and/or time are invalid. This error can be resolved by readjusting the system time in AMIBIOS Setup.
CMOS Battery Low	CMOS battery is low. This message usually indicates that the CMOS battery needs to be replaced. It could also appear when the user intentionally discharges the CMOS battery.
CMOS Settings Wrong	CMOS settings are invalid. This error can be resolved by using AMIBIOS Setup.

Message Displayed	Description
CMOS Checksum Bad	CMOS contents failed the Checksum check. Indicates that the CMOS data has been changed by a program other than the BIOS or that the CMOS is not retaining its data due to malfunction. This error can typically be resolved by using AMIBIOS Setup.

Miscellaneous

Message Displayed	Description
KBC BAT Test failed	Keyboard controller BAT test failed. This may indicate a problem with keyboard controller initialization.
Keyboard Error	Keyboard is not present or the hardware is not responding when the keyboard controller is initialized.
PS/2 Keyboard not found	PS/2 keyboard support is enabled in the BIOS setup but the device is not detected.
PS/2 Mouse not found	PS/2 mouse support is enabled in the BIOS setup but the device is not detected.
Keyboard/Interface Error	Keyboard controller failure. This may indicate a problem with system hardware.
Unlock Keyboard	PS/2 keyboard is locked. User needs to unlock the keyboard to continue the BIOS POST.
System Halted	The system has been halted. A reset or power cycle is required to reboot the machine. This message appears after a fatal error has been detected.
<INS> Pressed	Indicates that <INS> key is pressed during the BIOS POST. The POST will load and use default CMOS settings.
Password check failed	The password entered does not match the password set in the setup. This condition may occur for both Supervisor and User password verification.
Unknown BIOS error. Error code = 004Ah	This message is displayed when ADM module is not present in the AMIBIOS8 ROM.
Unknown BIOS error. Error code = 004Bh	This message is displayed when language module is not present in the AMIBIOS8 ROM.
Floppy Controller Failure	Error in initializing legacy Floppy Controller.

Index of Symptom-to-FRU Error Messages

To use the information in this section to diagnose a problem:

1. Find the error symptom in the left column.
2. If directed to a check procedure, replace the FRU indicated in the check procedure.
If no check procedure is indicated, the first Action/FRU item listed in the right column is the most likely cause.

NOTE: If you cannot find a symptom or an error in this list and the problem remains, see “Undetermined Problems” on page 80.

Symptom/Error	Action/FRU
Processor fan does not run but power supply fan runs.	<ul style="list-style-type: none"> • Ensure the system is not in power saving mode. • With the system powered on, measure the voltage of the processor fan connector. Its reading should be +12Vdc. If the reading shows normal, but the fan still does not work, then replace the heat sink fan. • Mainboard
Processor test failed.	<ul style="list-style-type: none"> • Processor • Mainboard

NOTE: Normally, the processor fan should be operative, and the processor clock setting should be exactly set to match its speed requirement before diagnosing any processor problems.

Symptom/Error	Action/FRU
Memory test failed.	<ul style="list-style-type: none"> • Memory module • Mainboard
Incorrect memory size shown or repeated during POST.	<ul style="list-style-type: none"> • Insert the memory modules in the DIMM sockets properly, then reboot the system. • Memory module • Mainboard
System works but fails to enter power saving mode when the Power Management Mode is set to Enabled.	<ul style="list-style-type: none"> • Enter CMOS Setup and load the default settings. In Windows systems, check settings in Power Management Property of the Control Panel. • Reload software from Recovery CD.
Blinking cursor only; system does not work.	<ul style="list-style-type: none"> • IDE drive connection/cables • IDE disk drives • See “Undetermined Problems”. • Mainboard

NOTE: Ensure the memory modules are installed properly and the contact leads are clean before diagnosing any system problems.

Symptom/Error	Action/FRU
Hard disk drive test failed.	<ul style="list-style-type: none"> • Enter CMOS Setup and load the default settings. • Hard disk drive cable • Hard disk drive • Mainboard
Hard disk drive cannot format completely.	<ul style="list-style-type: none"> • Enter CMOS Setup and load the default settings. • Hard disk drive cable • Hard disk drive • Mainboard
Hard disk drive has write error.	<ul style="list-style-type: none"> • Enter CMOS Setup and load the default settings. • Hard disk drive
Hard disk drive LED fails to light, but system operates normally.	<ul style="list-style-type: none"> • With the system power on, measure the voltage of the HDD LED connector. • HDD LED cable

NOTE: Make sure the hard disk drive is configured correctly in CMOS Setup and that cable/jumper are set correctly before diagnosing any hard disk drive problems. (If only one drive is installed, please make sure the drive is connected to master connector or the drive is set to master.)

Symptom/Error	Action/FRU
CD/DVD-ROM drive LED doesn't come on but works normally.	<ul style="list-style-type: none"> • Enter CMOS Setup and load the default settings. • DIMM • Mainboard
CD/DVD-ROM drive LED flashes for more than 30 seconds before LED shutting off. Software asks to reinstall disc. Software displays a reading CD/DVD error.	<ul style="list-style-type: none"> • CD/DVD-ROM may have dirt or foreign material on it. Check with a known good disc. • CD/DVD-ROM is not inserted properly. • CD/DVD-ROM is damaged.
CD/DVD-ROM drive cannot load or eject when the system is turned on and its eject button is pressed and held.	<ul style="list-style-type: none"> • Disconnect all cables from CD/DVD-ROM drive except power cable, then press the eject button to try to unload the disc. • CD/DVD-ROM drive power cable • CD/DVD-ROM drive
CD/DVD-ROM drive does not read and there are no messages are displayed.	<ul style="list-style-type: none"> • CD may have dirt or foreign material on it. Check with a known good disc. • Ensure the CD/DVD-ROM driver is installed properly. • CD/DVD-ROM drive.
CD/DVD-ROM drive can play audio CD but no sound output.	<ul style="list-style-type: none"> • Ensure the headphone jack of the CD/DVD-ROM has an output. • Turn up the sound volume. • Speaker power/connection/cable. • CD/DVD-ROM drive.

NOTE: Make sure the optical disc drive is configured correctly in CMOS Setup, the cable/jumper are set correctly and the drive's optical lens is clean before diagnosing any optical drive problems.

Symptom/Error	Action/FRU
Real-time clock is inaccurate.	<ul style="list-style-type: none"> • Ensure the information in the Standard CMOS Feature of BIOS Setup is set correctly. • RTC battery • Mainboard

Symptom/Error	Action/FRU
Audio software program invoked but no sound comes from speakers.	<ul style="list-style-type: none"> • Speaker power/connection/cable

Symptom/Error	Action/FRU
Modem ring cannot wake up system from suspend mode.	<ul style="list-style-type: none"> • For an external modem, make sure Power on By Ring in BIOS Setup or Power Management is set to Enabled. For the PCI modem, make sure Wake up by PCI card is set to Enabled. • If a PCI modem card is used, reinsert the modem card to the PCI slot firmly or replace the modem card. • In Windows OS, ensure the telephone application is configured correctly for your modem and set to receive messages and/or fax.
Data/fax modem software program invoked but cannot receive/send data/fax	<ul style="list-style-type: none"> • Ensure the modem card is installed properly.
Fax/voice modem software program invoked but has no sound output. (Data files are received normally; voice from modem cannot be produced, but system sound feature works normally.)	<ul style="list-style-type: none"> • Ensure the modem voice-in cable from modem adapter card is connected to the mainboard

Symptom/Error	Action/FRU
Video memory test failed.Video adapter failed.	<ul style="list-style-type: none"> • Remove all non-factory-installed cards. • Load default settings (if screen is readable). • Mainboard
Display problem <ul style="list-style-type: none"> • Incorrect colors • No high intensity • Missing, broken, or incorrect characters • Blank monitor (dark) • Blank monitor (bright) • Distorted image • Unreadable monitor 	<ul style="list-style-type: none"> • Monitor signal connection/cable • Monitor • Video adapter card • Mainboard
Display changing colors.	<ul style="list-style-type: none"> • Monitor signal connection/cable • Video adapter card • Mainboard

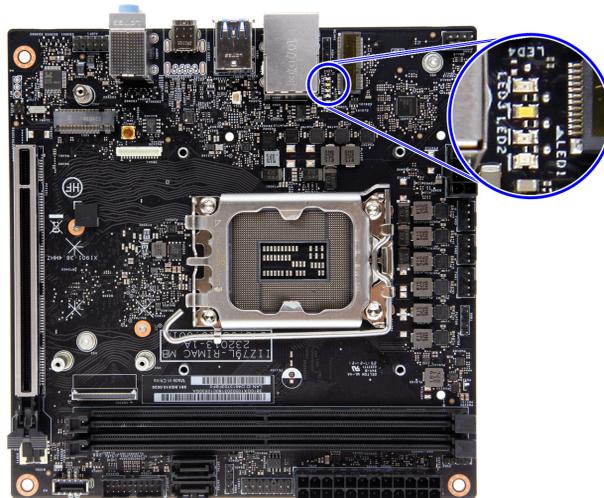
Symptom/Error	Action/FRU
Printing failed.	<ul style="list-style-type: none"> • Ensure the printer driver is properly installed. Refer to the printer service manual. • Printer • Printer cable • Mainboard.
Printer problems.	<ul style="list-style-type: none"> • Refer to the service manual for the printer.

Symptom/Error	Action/FRU
Some or all keys on keyboard do not work.	<ul style="list-style-type: none"> • Keyboard

Symptom/Error	Action/FRU
Pressing the power button does not turn off the system. (Only unplugging the power cord from electrical outlet can turn off the system.)	<ul style="list-style-type: none"> • Ensure the Soft-off by PWR-BTTN in CMOS Setup (under Power Management) is not set to Instant-off. • Power switch cable assembly
Pressing the power button does not turn on the system	<ul style="list-style-type: none"> • Ensure the power override switch (located at the back of the computer, just above the connector for the power cable) is not set to OFF. • Power switch cable assembly.
Executing software shutdown from Windows Start menu does not turn off the system. (Only pressing power button can turn off the system).	<ul style="list-style-type: none"> • Enter CMOS Setup and load the default settings. • Reload software from Recovery CD.
No system power, or power supply fan is not running.	<ul style="list-style-type: none"> • Power supply • Mainboard

LED Codes

When no error message is displayed but the computer stops during POST, check the LED debug light to determine cause of failure.



No.	KC	Action	Description
LED1	Memory	Red light on	System memory error/not installed
LED2	VGA	Yellow light on	Graphics card error/not installed, graphics card memory error or graphics card BIOS checksum error
LED3	BIOS Damaged	White light on	BIOS is damaged, BIOS POST jumps to Boot Block recovery procedures
LED4	Setup Settings or CMOS Damaged	Green light on	<ul style="list-style-type: none"> Setup Settings error, CMOS checksum error or CMOS battery loss occurs. Default settings loaded
-	System Ready	All light on 3 sec (Red, Yellow, White, Green)	Once OEM logo display and keyboard function are ready

Undetermined Problems

- NOTE**
- Verify that all attached devices are supported by the computer.
 - Verify that the power supply being used at the time of the failure is operating correctly. (See "Power System Check" on page 111)

Follow the procedures below to isolate the failing FRU. Do not isolate non-defective FRU.

1. Power off the computer.
2. Visually check them for damage. If any problems are found, replace the FRU.
3. Remove or disconnect all of the following devices:
 - Non-Acer devices
 - Printer, mouse, and other external devices
 - Storage drive
 - DIMM
 - Expansion boards
4. Power on the computer.
5. Determine if the problem has been resolved.
6. If the problem does not recur, reconnect the removed devices one at a time until you find the failed FRU. If the problem persists, replace the mainboard. Do not replace a non-defective FRU.

BIOS Recovery

When you boot up the computer and you hear one long beep, followed by a shorter one, the system BIOS is damaged. This may be caused by an interruption during a BIOS flash procedure (e.g. a power outage) or a corrupted BIOS code, which will cause the system to go into an unbootable state. You need to access and execute the boot block program to reboot the computer and recover the regular BIOS code.

Note the following when restoring the BIOS settings:

- Make sure the computer is connected to a UPS unit during the BIOS recovery process.
- The BIOS recovery media should be prepared in a computer running the Windows OS. A USB flash drive can be used.

Creating the BIOS Crisis Recovery Disk

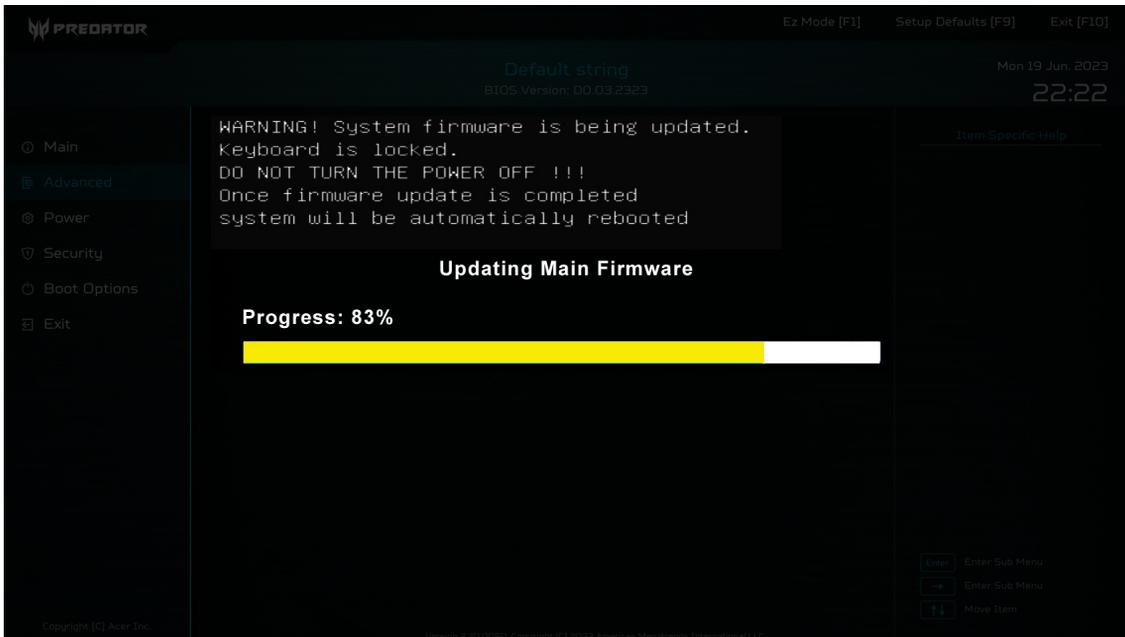
1. Set up a computer running the Windows operating system and connect the BIOS recovery media.
2. Copy the target BIOS ROM file to the BIOS recovery media and rename it as "RCVBOOT.CAP".
3. Eject the BIOS recovery media from the computer.

Performing a BIOS Recovery

NOTE This procedure is only applicable when the boot block section is still valid.

1. Shut down the system with failed BIOS.
2. Put the BIOS ROM file (it may exist at \ROM\xxx.CAP) to a USB storage.
3. Rename BIOS ROM file to RCVBOOT.CAP (i.e. P11-A0.CAP to RCVBOOT.CAP)
4. Plug the USB storage to the system.
5. Press the power button to turn on the system.

The system will now execute the BIOS recovery process. You will hear a long beep followed by a short beep.



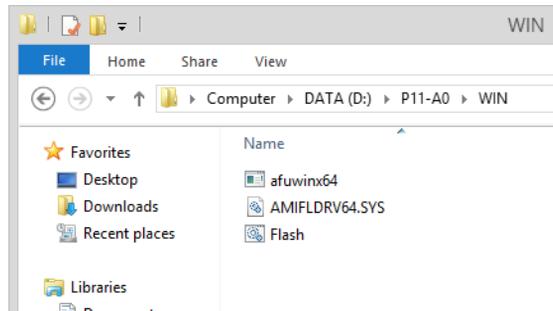
6. Wait for the program to finish with the recovery.
7. Press any key to reboot system.
8. The BIOS recovery is now completed.

BIOS Update

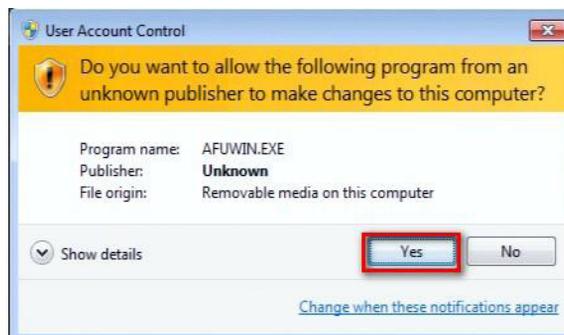
Updating the BIOS using Windows Flash Utility:

Perform the following to use the Windows Flash Utility:

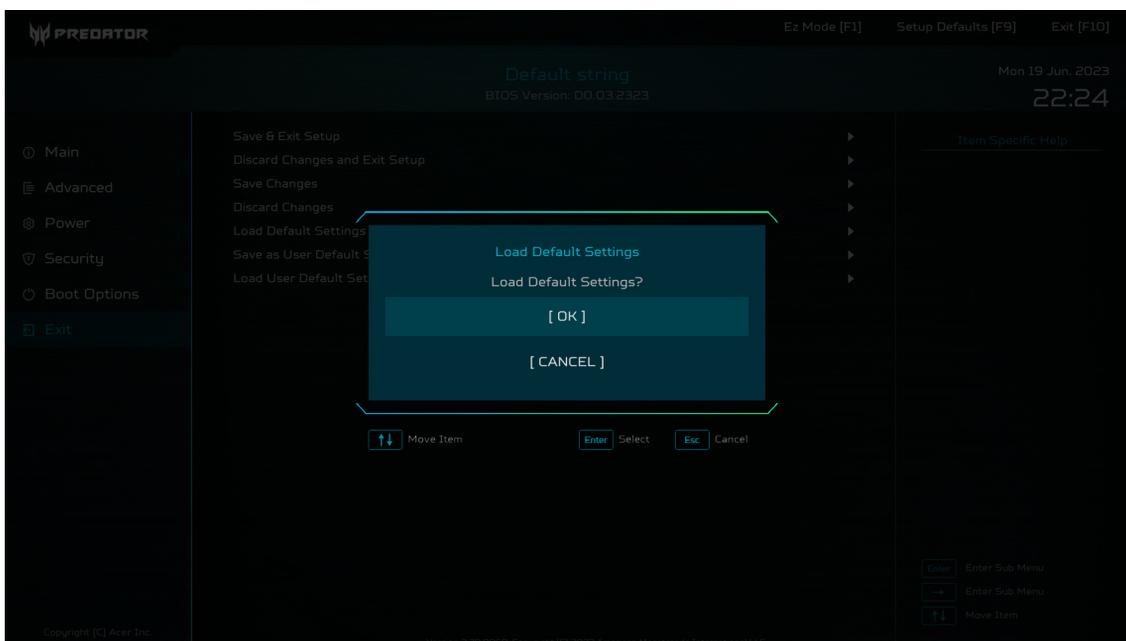
1. Enter **WIN** folder and select **Flash.bat**.



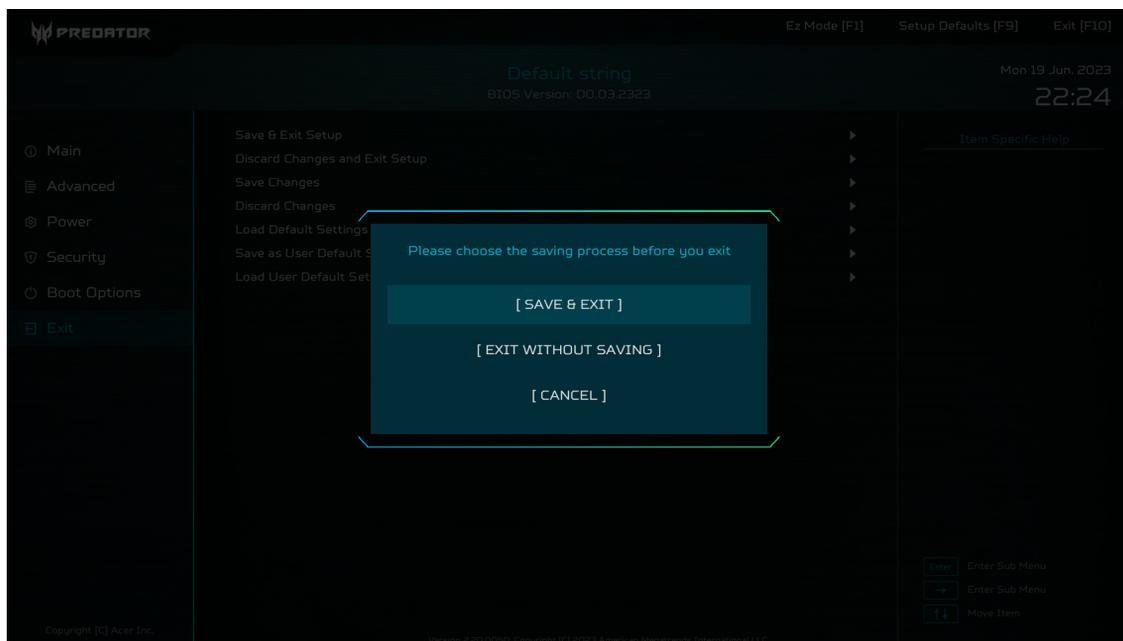
2. Double click **Flash.bat**. A pop-up window will appear.
3. Select **Yes** to continue.



4. Wait until the BIOS finish updating, then boot the system.
 5. During POST, press **Delete** to enter BIOS Setup Utility.
- If you fail to press **Delete** before POST is completed, you will need to restart the computer.
6. Press **F9** to **Load Default Setting**. Select **OK** to load default setting.



7. Press **F10** to **Exit** setup. Select **SAVE & EXIT** and press **Enter**.

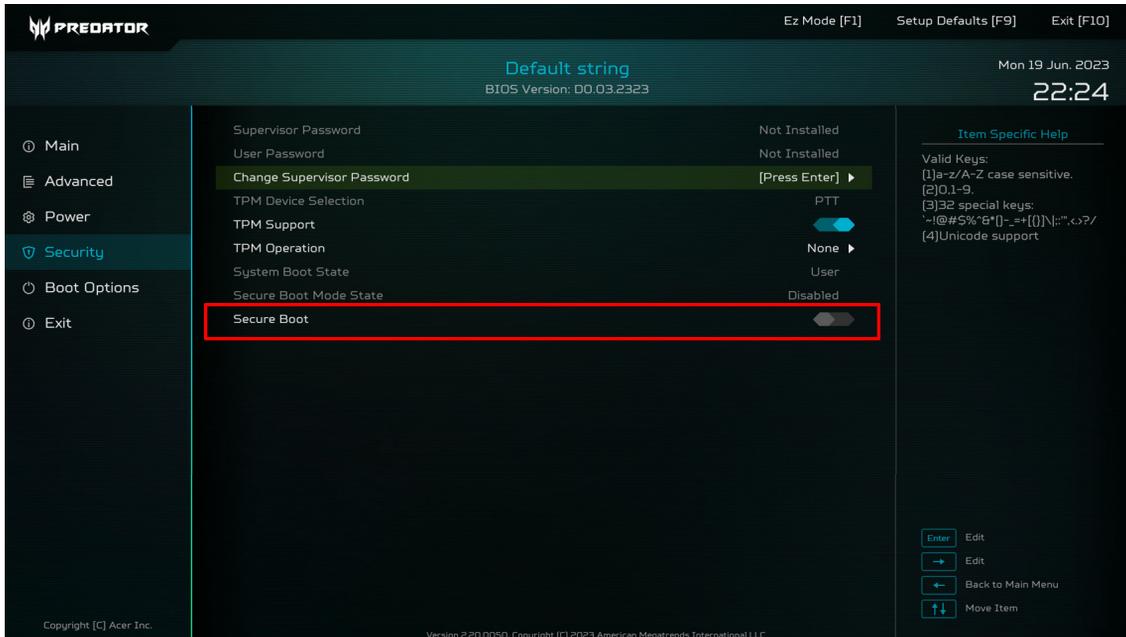


8. Select **Yes** to Restart.

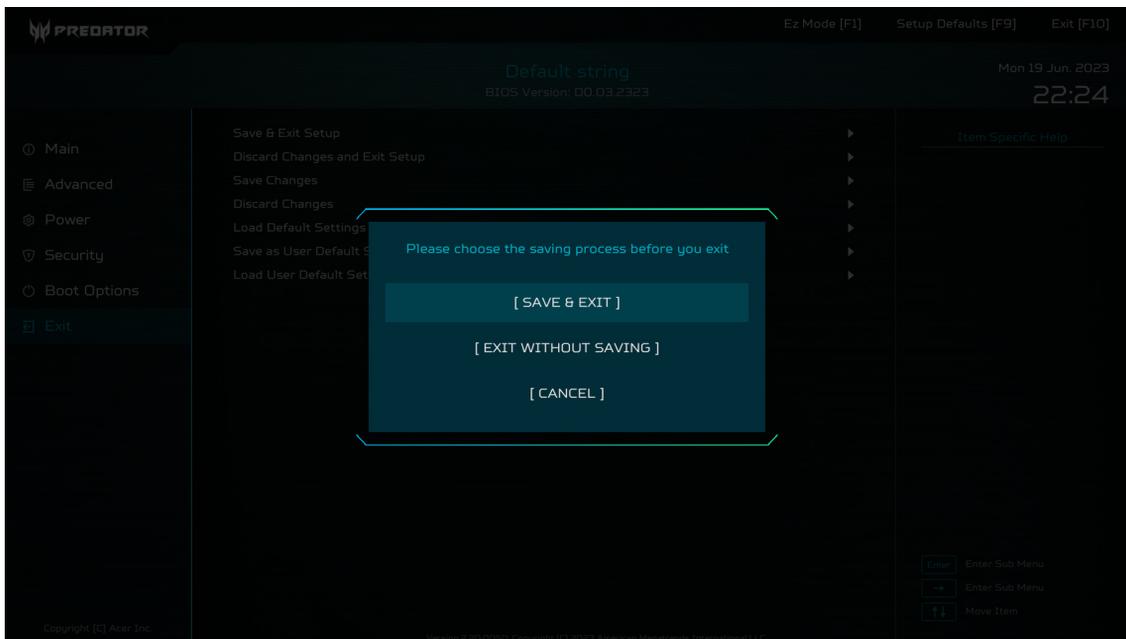
Updating the BIOS using EFI Flash Utility

Perform the following to use the EFI Flash Utility:

1. Press the power button to turn on the system.
2. Press Delete when the company logo is displayed on the screen to enter BIOS Setup Menu.
3. Go to the **Security** page, select **Secure Boot** and press **Enter**. Select **Disabled** to disable Secure Boot.



4. Press **F10** to **Exit** setup. Select **SAVE & EXIT** and press **Enter**.



5. Select **Yes** to Restart.
6. Press the **F12** hot key to enter Boot Menu, then select USB thumbdrive.

7. Choose the Removable BlockDevice group. The Removable BlockDevice location is dynamic. In the screen shot below, user should key in fs5: in Shell command line.

```
fs2 :HardDisk - Alias hd22e blk2
Acpi (PNP0A03,0)/Pci (1F12)/?/HD (Part4,Sig346BC586-3025-4D0E-9603-68E5D2C25B3B)
fs3 :HardDisk - Alias hd22f blk3
Acpi (PNP0A03,0)/Pci (1F12)/?/HD (Part5,Sig786109A0-E698-4366-AA0D-9D58FCCEC46D)
fs4 :HardDisk - Alias hd22g blk4
Acpi (PNP0A03,0)/Pci (1F12)/?/HD (Part6,SigF1FABDB5-D18E-4D54-87BF-525E95B0608D)
fs5 :Removable HardDisk - Alias hd15b0d0b blk5
Acpi (PNP0A03,0)/Pci (1D10)/Usb (1, 0)/Usb (3, 0)/HD (Part1,Sig0189F303)
blk0 :HardDisk - Alias hd22b fs0
Acpi (PNP0A03,0)/Pci (1F12)/?/HD (Part1,Sig31FD0B73-A723-450C-B5AC-38CD1B95B4C2)
blk1 :HardDisk - Alias hd22c fs1
Acpi (PNP0A03,0)/Pci (1F12)/?/HD (Part2,Sig5C776472-D735-4BF7-9D2E-955ADB103B02)
blk2 :HardDisk - Alias hd22e fs2
Acpi (PNP0A03,0)/Pci (1F12)/?/HD (Part4,Sig346BC586-3025-4D0E-9603-68E5D2C25B3B)
blk3 :HardDisk - Alias hd22f fs3
Acpi (PNP0A03,0)/Pci (1F12)/?/HD (Part5,Sig786109A0-E698-4366-AA0D-9D58FCCEC46D)
blk4 :HardDisk - Alias hd22g fs4
Acpi (PNP0A03,0)/Pci (1F12)/?/HD (Part6,SigF1FABDB5-D18E-4D54-87BF-525E95B0608D)
blk5 :Removable HardDisk - Alias hd15b0d0b fs5
Acpi (PNP0A03,0)/Pci (1D10)/Usb (1, 0)/Usb (3, 0)/HD (Part1,Sig0189F303)
blk6 :HardDisk - Alias (null)
Acpi (PNP0A03,0)/Pci (1F12)/?/HD (Part3,SigC2D33479-D097-4DDF-91F5-00CAB15B5E5C)
blk7 :BlockDevice - Alias (null)
Acpi (PNP0A03,0)/Pci (1F12)/?
blk8 :BlockDevice - Alias (null)
Acpi (PNP0A03,0)/Pci (1F12)/?
blk9 :Removable BlockDevice - Alias (null)
Acpi (PNP0A03,0)/Pci (1D10)/Usb (1, 0)/Usb (3, 0)

Press ESC in 4 seconds to skip startup.nsh, any other key to continue.
Shell> fs5:._
```

8. Enter the “EFI” folder, then enter the “AFU” sub-folder

```
fs5:\P11-A0\EFI> dir
Directory of: fs5:\P11-A0\EFI

07/30/12 10:51a <DIR>      0 .
07/30/12 10:51a <DIR>      0 ..
07/29/12 04:19p <DIR>      0 AFU
0 File(s)          0 bytes
3 Dir(s)
```

9. Type `flash_x64.nsh` and press **Enter** to flash the ROMs

```
fs5:\P11-A0\EFI\AFU> dir
Directory of: fs5:\P11-A0\EFI\AFU

07/30/12 10:51a <DIR>      0 .
07/30/12 10:51a <DIR>      0 ..
07/17/12 11:41a    r    334,448 AfuEfiX64.efi
07/30/12 11:49a    r     46 flash_x64.nsh
2 File(s)        334,494 bytes
2 Dir(s)
```

```
fs5:\P11-A0\EFI\AFU> flash_x64.nsh
```

10. Wait until the the system finish flashing the ROMs.

```
fs5:\P11-A0\EFI\AFUD> flash_x64.nsh
flash_x64.nsh> AfuEfix64.efi ..\..\Rom\P11-A0.CAP /P /B /N /R
-----+-----
|          AMI Firmware Update Utility  v3.02.00          |
|    Copyright (C)2012 American Megatrends Inc. All Rights Reserved.    |
|-----+-----|
Reading flash ..... done
Secure Flash enabled, recalculate ROM size with signature...
- FFS checksums ..... ok
Loading capsule to secure memory buffer ... done
Erasing Boot Block ..... done
Updating Boot Block ..... done
Verifying Boot Block ..... done
Erasing Main Block ..... done
Updating Main Block ..... done
Verifying Main Block ..... done
Erasing NVRAM Block ..... done
Updating NVRAM Block ..... done
Verifying NVRAM Block ..... done

fs5:\P11-A0\EFI\AFUD> _
```

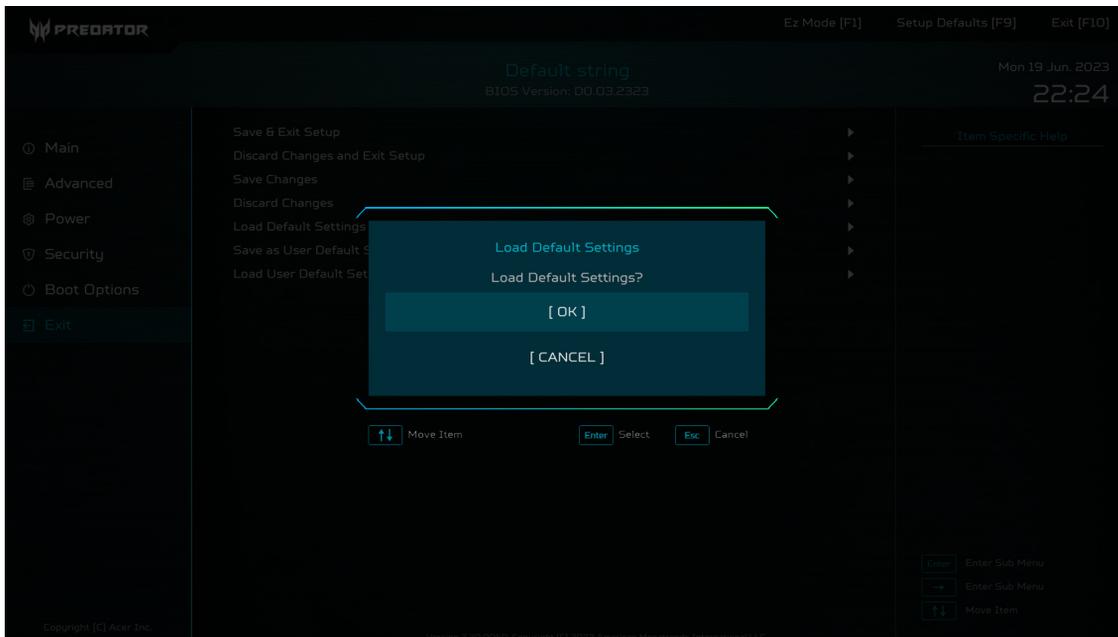
11. Press the power button to shut down the system.

12. Boot the system.

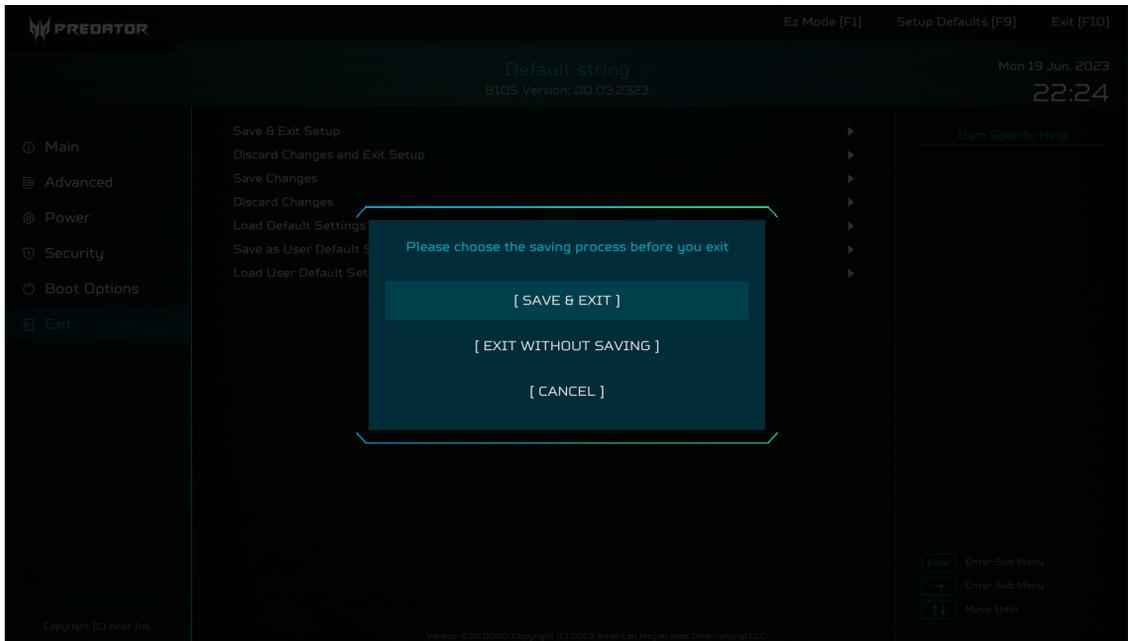
13. During POST, press **Delete** to enter BIOS Setup Utility.

If you fail to press **Delete** before POST is completed, you will need to restart the computer.

14. Press **F9** to **Load Default Setting**. Select **OK** to load default setting.



15. Press **F10** to **Exit** setup. Select **SAVE & EXIT** and press **Enter**.



16. Select **Yes** to Restart.

Clearing CMOS

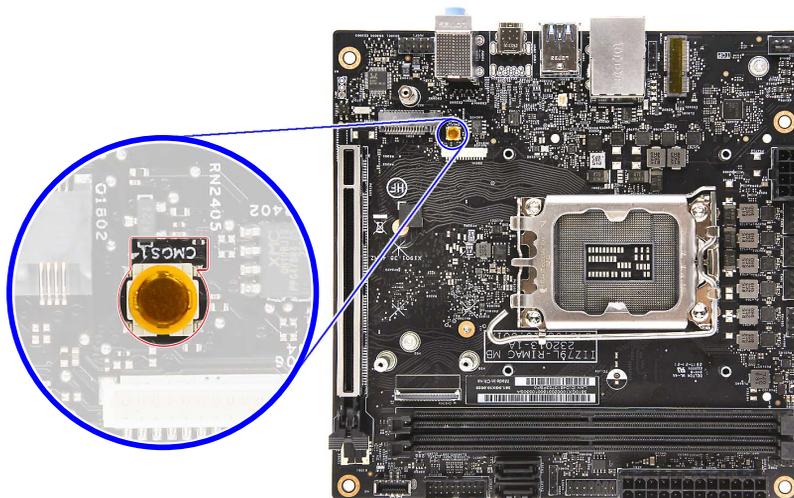
You may need to clear the Setup configuration values (CMOS) if the configuration has been corrupted, or if incorrect settings made in the Setup Utility caused error messages to be unreadable. This procedure will clear the BIOS supervisor password as well.

Use the CMOS1 jumper to clear the CMOS data.

- 1-2 position: Normal operation (default)
- 2-3 position: Clear CMOS data

To clear the CMOS data:

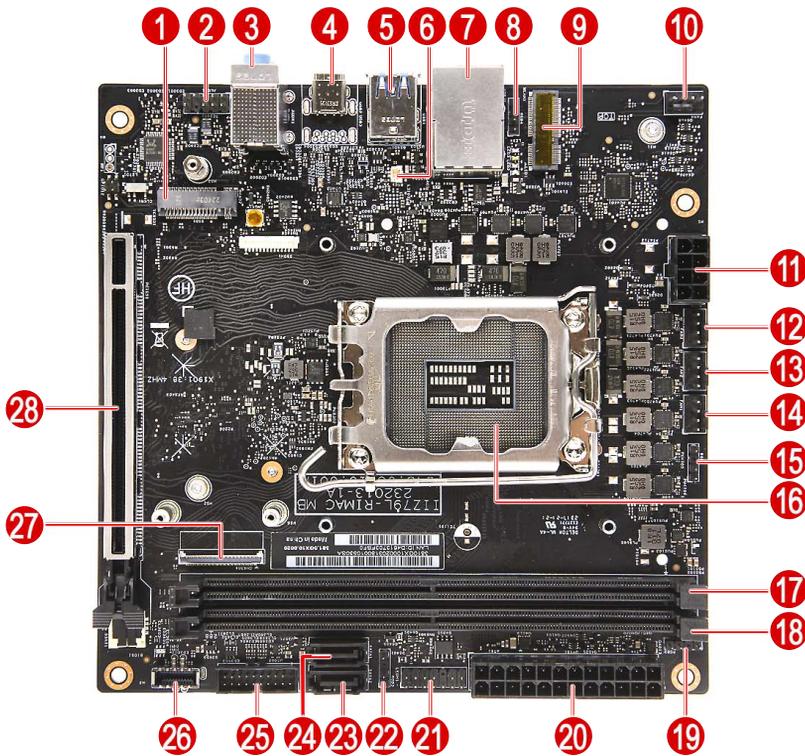
1. Turn off the power to the computer and all peripherals.
2. Unplug the power cord from the computer.
3. Unplug the network cable and all connected peripheral devices from the computer.
4. Place the computer on a flat, steady surface.
5. Remove the right side panel.
6. If necessary, remove any expansion cards, assemblies or cables that prevent access to the CMOS clear jumper.
7. Locate the CMOS1 button on the mainboard.



8. Push the CMOS1 button to clear CMOS.
9. Reinstall any expansion card, peripheral, and system cables that have previously been removed.
10. Reinstall the right side panel.
11. Connect the AC power cord to the system.
12. Press the power button  to turn on the computer.
13. During POST, press **Delete** to access the Setup Utility.
14. Press **F9** to load the system default values.
15. Press **F10** to save the changes you made and close the Setup Utility.

Mainboard Layout

This section shows the major mainboard components.



No.	Code	Component	No.	Code	Component
1	SSD1	M.2(2280) M-key SSD1 slot	15	RGB1	System fan ARGB header
2	AUDF1	Front panel audio jack header	16	CPU1	CPU
3	AUDR1	Rear panel audio jack	17	DIMM2	DDR5 240-pin UDIMM slots
4	USB2	Rear panel USB3.2 Gen2x2 Type C Connector	18	DIMM1	DDR5 240-pin UDIMM slots
5	USB1	Rear panel USB3.2 Gen2 Type A connector*2	19	RGB2	System fan ARGB header
6	RTC1	RTC battery connector	20	ATX1	24-Pin ATX power connector
7	U2RJ1	USB2.0*2 + LAN connector	21	LEDH1	Power button/LED cable header
8	RGB4	System fan ARGB header	22	RGB3	Front panel ARGB header
9	WLAN1	M.2(2230) E-key Slot for WLAN	23	SATA2	SATA connector
10	FAN4	4-Pin system fan header	24	SATA1	SATA connector
11	ATX2	8-Pin ATX power connector	25	USB3F1	Front I/O header
12	FAN3	4-Pin system fan header	26	USB3F2	Key-A header (for portable SSD)
13	FAN2	4-Pin CPU fan header	27	CN6301	SSD BD connector
14	FAN1	4-Pin system fan header	28	PCIES1	PCI Express Gen5 x16 Slot

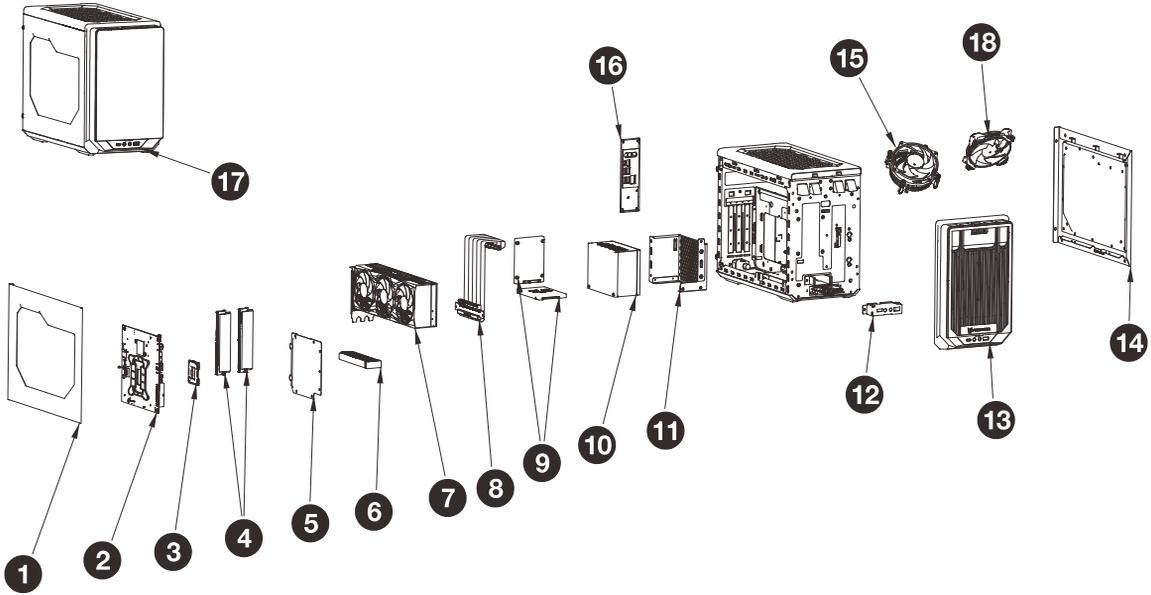
Field Replaceable Unit (FRU) List

This chapter gives you the FRU (Field Replaceable Unit) listing of the Predator Orion X-650 Desktop Computer global configurations. Refer to this list when ordering for repair parts or for RMA (Return Merchandise Authorization).

IMPORTANT When ordering FRU parts, check the most up-to-date information available on your regional web or channel. For whatever reasons a part number is changed, it will NOT be noted on the printed Service Guide. For Acer authorized service providers, your Acer office may have a different part number code from those given in the FRU list of this printed Service Guide. You **MUST** use the local FRU list provided by your regional Acer office to order FRU parts for service.

NOTE Follow the local government regulations, or the rules set by your regional office on how to return or dispose of defective parts.

Exploded Diagram

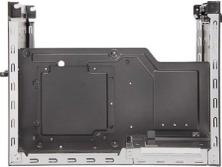


Number	Part Name	Part No.	Quantity
1	Left Side Panel	360.0GX0C.0001	1
2	Mainboard	381.0GX10.0020	1
3	Intel Core i9 CPU	KC.13701.C17	1
4	DDRIV Memory Module	KN.16G0C.007	1
5	PCIe Cover	333.0GX0G.0001	1
6	Portable SSD Device	360.0GX09.0001	1
7	VGA Card	DA.40T11.001	1
8	VGA Bracket	333.0GX0K.0001	1
9	SSD Module	KN.01K04.005	1
10	Power Supply Unit	DC.85018.001	1
11	PSU Bracket	334.0GX0B.0001	1
12	Front I/O Bracket	360.0GX0A.0001	1
13	Front Bezel	360.0GX08.0001	1
14	Right Side Panel	360.0GX0D.0001	1
15	Thermal Module	DC.10811.028	1
16	Rear I/O Shielding	360.0GX02.0001	1
17	Main Chassis	360.0GX05.0001	1
18	System Fan	DC.10911.00P	1

Predator Orion X-650 FRU List

ACER_POX-650_RIMAC (NO: 381.0GX01.0003)

Category	Description	Acer Part No.
ACCESSORIES		
	CPUSER PCIE Gen4 cable PCIE Gen4 cable 1CA52310-001 L=280mm	DP.13411.0IT
	Predator M.2 SSD Portable Device D=134.6mm W=35mm H=15mm	DP.13411.0J2
BOARDS		
	BOARD SSD RIMAC	55.E3SD1.001
	Wireless LAN Intel Wi-Fi 6E BT5.2 AX211.NGWG.NV Intel 2x2 M.2 2230 CNVi GFP2 No vPro	KE.WF60N.003
	Wireless LAN Intel Wi-Fi 6E BT5.2 Killer 1675i AX211.NGWG.NVX Intel 2x2 M.2 2230 CNVi GFP2 No vPro	KE.WF60N.005
	Wireless LAN Intel Wi-Fi 6E BT5.3 Killer 1690i AX411.NGWG.NVX Intel 2x2DBC M.2 2230 CNVi GFP4 No vPro	KE.WF60N.010
CABLES		
	POWER CORD 125V US BK 1.8M	27.01518.0I1
	POWER CORD 250V EUROPE BK 1.8M	27.01518.0J1
	POWER CORD 250V CHINA BK 1.8M	27.01518.0K1
	POWER CORD 250V SWISS BK 1.8M	27.01518.0L1
	POWER CORD 125V TAIWAN BK 1.83M	27.01518.0M1
	POWER CORD 250V AUSTRALIA BK 1.8M	27.01518.0N1
	POWER CORD 250V INDIA BK 1.83M	27.01518.0P1
	POWER CORD 250V SOUTH AFRICA BK 1.8M	27.01518.0Q1
	POWER CORD 250V DENMARK BK 1.8M	27.01518.0S1
	POWER CORD 125V JAPAN BK 1.8M	27.01518.181
	POWER CORD 125V MEXICO BK 1.8M	27.01518.A01
	POWER CORD 250V UK BK 1.8M	27.03118.031
	POWER CORD 250V KOREA BK 1.8M	27.SLSD1.001
	POWER CORD 250V ARGENTINE BK 1.8M	27.SLSD1.002
	POWER CORD 250V ISRAEL BK 1.8M	27.VEHD1.001
POWER CORD 250V ITALY BK 1.8M	27.VG6D1.001	
	CABLE 60MM SSD BOARD TO MAIN BOARD	50.E3SD1.001
	CABLE SATA 380MM HDD TO MAIN BOARD	50.E3SD1.002

Category	Description	Acer Part No.
	ANTENNA WLAN AUX	50.E3SD1.003
	ANTENNA WLAN MAIN	50.VWSD1.001
CASE/COVER/BACKET ASSEMBLY		
	BEZEL RIMAC BP23A	66.E3SD1.001
	CHASSIS RIMAC CP23A	66.E3SD1.002
	TOP COVER RIMAC	65.E3SD1.001
	VGA BRACKET RIMAC	33.E3SD1.001
CPU/PROCESSOR		
	CPU Intel Core i5 13400 LGA 2.5 GHz 18M 3200 1700 65W B0 Raptor Lake-S	KC.13401.CB5
	CPU(PGA) Intel Core i5 13400 LGA 2.5 GHz 18M 3200 1700 65W Raptor Lake-S	KC.13401.CI5
	CPU(PGA) Intel Core i5 13400F LGA 2.5 GHz 18M 3200 1700 65W B0 Raptor Lake-S	KC.13401.FB5
	CPU(PGA) Intel Core i5 13400F LGA 2.5 GHz 18M 3200 1700 65W Raptor Lake-S	KC.13401.FI5
	CPU Intel Core i7 13700 LGA 2.1 GHz 25M 3200 1700 65W B0 Raptor Lake-S	KC.13701.CI7
	CPU Intel Core i7 13700F LGA 2.1 GHz 25M 3200 1700 65W B0 Alder Lake-S	KC.13701.FI7
FAN		
	Cooler Master Predator FrostBlade 21Q2 12cm ARGB fan DF1202512RFUN Black frame 7 blades 8pcs ARGB Rifel bearing (sleeve)	DC.10911.00P
HEATSINK		
	HEATSINK FOR SSD RIMAC	24.E3SD1.001

Category	Description	Acer Part No.
	2Q2 Intel 65W cooler with RGB lighting LGA1700 12V@4000rpm (HS-92*20-AL FAN 90*25.4) 4*RGB	DC.10811.023
	23Q1 Intel 65W cooler with ARGB fan LGA1700 12V@4000rpm (HS-90*20-AL6063 T5 FAN 90*25.4 with ARGB*8) 67.26cfm, 5.14mm-H2O, 37.7dBA	DC.10811.028
KEYBOARD		
	Keyboard PRIMAX KBCY21 USB US support RGB, USB KB, brown box	DK.USB1P.0LJ
	Keyboard PRIMAX KBCY21 USB Thailand support RGB, USB KB, brown box	DK.USB1P.0LK
	Keyboard PRIMAX KBCY21 USB Spanish support RGB, USB KB, brown box	DK.USB1P.0LL
	Keyboard PRIMAX KBCY21 USB Japanese support RGB, USB KB, brown box	DK.USB1P.0LM
	Keyboard PRIMAX KBCY21 USB German support RGB, USB KB, brown box	DK.USB1P.0LN
	Keyboard PRIMAX KBCY21 USB French support RGB, USB KB, brown box	DK.USB1P.0LP
	Keyboard PRIMAX KBCY21 USB UK support RGB, USB KB, brown box	DK.USB1P.0LQ
	Keyboard PRIMAX KBCY21 USB Swiss/G support RGB, USB KB, brown box	DK.USB1P.0LR
	Keyboard PRIMAX KBCY21 USB Russian support RGB, USB KB, brown box	DK.USB1P.0LS
	Keyboard PRIMAX KBCY21 USB Nordic support RGB, USB KB, brown box	DK.USB1P.0LT
	Keyboard PRIMAX KBCY21 USB Czech/Slovak support RGB, USB KB, brown box	DK.USB1P.0LU
	Keyboard PRIMAX KBCY21 USB Italian support RGB, USB KB, brown box	DK.USB1P.0LV
	Keyboard PRIMAX KBCY21 USB Swiss/FR support RGB, USB KB, brown box	DK.USB1P.0LW
	Keyboard PRIMAX KBCY21 USB Arabic/English support RGB, USB KB, brown box	DK.USB1P.0LX
	Keyboard PRIMAX KBCY21 USB Traditional Chinese support RGB, USB KB, brown box	DK.USB1P.0LY
	Keyboard PRIMAX KBCY21 USB English/Canadian French support RGB, USB KB, brown box	DK.USB1P.0LZ
	Keyboard PRIMAX KBCY21 USB Portuguese support RGB, USB KB, brown box	DK.USB1P.0M0
	Keyboard PRIMAX KBCY21 USB Belgium support RGB, USB KB, brown box	DK.USB1P.0M1
	Keyboard PRIMAX KBCY21 USB Polish support RGB, USB KB, brown box	DK.USB1P.0M2
Keyboard PRIMAX KBCY21 USB Arabic/French support RGB, USB KB, brown box	DK.USB1P.0M3	
Keyboard PRIMAX KBCY21 USB Spanish Latin support RGB, USB KB, brown box	DK.USB1P.0M4	

Category	Description	Acer Part No.
KEYBOARD (Cont.)	Keyboard PRIMAX KBCY21 USB Ukrainian support RGB, USB KB, brown box	DK.USB1P.0M5
	Keyboard PRIMAX KBCY21 USB US International support RGB, USB KB, brown box, for EMEA	DK.USB1P.0M6
	Keyboard PRIMAX KBCY21 USB Hungarian support RGB, USB KB, brown box	DK.USB1P.0M7
MAINBOARD		
	Mainboard Intel H770 (KILLER E3100G) Raptor Lake-S CPU supported	DB.E3R11.002
MEMORY		
	Memory KINGSTON UNB-DIMM DDRV 4800 16GB ACR48U40BS8MA-16F LF+HF black version, MI-A16, Fury logo	KN.16G07.042
	Memory A-DATA UNB-DIMM DDRV 4800 16GB AM2V48UCSV1-BFFS LF+HF Black version	KN.16G0C.007
	Memory A-DATA UNB-DIMM DDRV 4800 8GB AO2V48UC8W1-BHLS LF+HF SS-B. 1Rx16 Black Heatsink, Predator logo	KN.8GB0C.028
POINTING DEVICE		
	PRIMAX USB MOUSE MOM2UO SUPPORT RGB, USB MOUSE, PROGRAMMABLE, BROWN BOX.	DC.11211.02F
POWER SUPPLY		
	PSU FSP FSP850-57SBB 850W Active PFC SFX (125 (W) x 64 (H) x 100 (D)) Gen5	DC.85018.001
SCREWS		
	SCREW MECH TRUSS M3*L4 NI	86.3A534.4R0
	SCREW,6-32X1/4,HEX,TF,ZPS,BLK	86.B9AD1.001
	SCREW M2X4 KSH MS BLO NYLOK	86.BFZD1.001
	SCREW TAP FLAT D5 L10 BLACK	86.E3SD1.001
	SCREW WAFER M2*L3.5 BZN BH RP	86.E3SD1.002
	SCREW MA HEX 6-32 L5 BLACK 3NOD	86.SR2D1.001

Category	Description	Acer Part No.
SSD/SOLID STATE DRIVE		
	Flash Disk MICRON SSD NAND 1024GB Micron 2450 1024GB MTFDKBA1T0TFK-1BC15ABYY LF+HF	KN.01K04.005
	Flash Disk HYNIX SSD NAND 1024GB M.2 2280 BC901 1024G HFS001TEJ9X110N	KN.01K0G.004
	Flash Disk MICRON SSD NAND 512GB Micron 2450 512GB MTFDKBA512TFK-1BC15ABYY LF+HF	KN.51204.038
	Flash Disk WD SSD NAND 512GB SN740 SDDQNQD-512G-1014 LF+HF	KN.5120D.052
VGA CARD		
	VGA Nvidia RTX 4080 DP DP DP HDMI PCP VGA Card NVIDIA RTX 4080 GDDRVIX 16GB ATX PCI-Ex16 DP DP DP HDMI	DA.40811.001
	VGA Card NVIDIA RTX 4070Ti GDDRVIX 12GB ATX PCI-Ex16 DP DP DP HDMI 288-1N696-X01A8	DA.40T11.001
	VGA Card NVIDIA RTX 4070Ti GDDRVIX 12GB ATX PCI-Ex16 DP DP DP HDMI 288-5N696-X01A8 V2	DA.40T11.002

Test Compatible Components

This computer's compatibility is tested and verified by Acer's internal testing department. All of its system functions are tested for both the Home Basic and Home Premium editions of Microsoft's Windows 10 operating system.

Refer to the following lists for components, adapter cards, and peripherals which have passed these tests. Regarding configuration, combination and test procedures, please refer to the Predator Orion X-650 Windows 10 Compatibility Test Report released by the Acer Mobile System Testing Department.

Approved Vendor List (AVL)

Components	Vendor	Model Name or Key Spec.	Acer Part No.
Accessories	CPUSER	CPUSER PCIE Gen4 cable PCIE Gen4 cable 1CA52310-001 L=280mm	DP.13411.0IT
Accessories	CPUSER	Predator M.2 SSD Portable Device D=134.6mm W=35mm H=15mm	DP.13411.0J2
Accessories	WNC	all WLAN 6E M.2 Main & AUX Antenna for Metal type 2 pcs M.2 PIFA Antenna	DP.13411.0ES
Bezel	JIANFU	JIANFU Predator POX BP23A Bezel w/ USB3.2 Ax1, USB3.1 Cx1, USB2.0x2, w/ audio port x2	DC.11911.0FJ
Chassis	JIANFU	JIANFU Predator POX Chassis ITX CP23A w/ HDD x2, 240mmLQ	DC.13111.098
CPU	Intel	CPU Intel Core i5 13400 LGA 2.5 GHz 18M 3200 1700 65W B0 Raptor Lake-S	KC.13401.CB5
CPU	Intel	CPU Intel Core i7 13700 LGA 2.1 GHz 25M 3200 1700 65W B0 Raptor Lake-S	KC.13701.CI7
CPU	Intel	CPU Intel Core i7 13700F LGA 2.1 GHz 25M 3200 1700 65W B0 Alder Lake-S	KC.13701.FI7
CPU	Intel	CPU(PGA) Intel Core i5 13400 LGA 2.5 GHz 18M 3200 1700 65W Raptor Lake-S	KC.13401.CI5
CPU	Intel	CPU(PGA) Intel Core i5 13400F LGA 2.5 GHz 18M 3200 1700 65W B0 Raptor Lake-S	KC.13401.FB5
CPU	Intel	CPU(PGA) Intel Core i5 13400F LGA 2.5 GHz 18M 3200 1700 65W Raptor Lake-S	KC.13401.FI5
CPU Cooler	CM	23Q1 Intel 65W cooler with ARGB fan LGA1700 12V@4000rpm (HS-90*20-AL6063 T5 FAN 90*25.4 with ARGB*8) 67.26cfm, 5.14mm-H2O, 37.7dBA	DC.10811.028
CPU Cooler	CM	2Q2 Intel 65W cooler with RGB lighting LGA1700 12V@4000rpm (HS-92*20-AL FAN 90*25.4) 4*RGB	DC.10811.023
HDD	WD	HDD WD 2.5" 5400rpm 1000GB WD10SPZX-21Z10T0, 7mmzh 1D, 1TB/P, MN1000S SATA III 128MB LF F/W: 02.01A02	KH.01K08.035

Components	Vendor	Model Name or Key Spec.	Acer Part No.
Keyboard	Primax	Keyboard PRIMAX KBCY21 USB Arabic/English support RGB, USB KB, brown box	DK.USB1P.0LX
Keyboard	Primax	Keyboard PRIMAX KBCY21 USB Arabic/French support RGB, USB KB, brown box	DK.USB1P.0M3
Keyboard	Primax	Keyboard PRIMAX KBCY21 USB Belgium support RGB, USB KB, brown box	DK.USB1P.0M1
Keyboard	Primax	Keyboard PRIMAX KBCY21 USB Czech/Slovak support RGB, USB KB, brown box	DK.USB1P.0LU
Keyboard	Primax	Keyboard PRIMAX KBCY21 USB English/Canadian French support RGB, USB KB, brown box	DK.USB1P.0LZ
Keyboard	Primax	Keyboard PRIMAX KBCY21 USB French support RGB, USB KB, brown box	DK.USB1P.0LP
Keyboard	Primax	Keyboard PRIMAX KBCY21 USB German support RGB, USB KB, brown box	DK.USB1P.0LN
Keyboard	Primax	Keyboard PRIMAX KBCY21 USB Hungarian support RGB, USB KB, brown box	DK.USB1P.0M7
Keyboard	Primax	Keyboard PRIMAX KBCY21 USB Italian support RGB, USB KB, brown box	DK.USB1P.0LV
Keyboard	Primax	Keyboard PRIMAX KBCY21 USB Japanese support RGB, USB KB, brown box	DK.USB1P.0LM
Keyboard	Primax	Keyboard PRIMAX KBCY21 USB Nordic support RGB, USB KB, brown box	DK.USB1P.0LT
Keyboard	Primax	Keyboard PRIMAX KBCY21 USB Polish support RGB, USB KB, brown box	DK.USB1P.0M2
Keyboard	Primax	Keyboard PRIMAX KBCY21 USB Portuguese support RGB, USB KB, brown box	DK.USB1P.0M0
Keyboard	Primax	Keyboard PRIMAX KBCY21 USB Russian support RGB, USB KB, brown box	DK.USB1P.0LS
Keyboard	Primax	Keyboard PRIMAX KBCY21 USB Spanish Latin support RGB, USB KB, brown box	DK.USB1P.0M4
Keyboard	Primax	Keyboard PRIMAX KBCY21 USB Spanish support RGB, USB KB, brown box	DK.USB1P.0LL
Keyboard	Primax	Keyboard PRIMAX KBCY21 USB Swiss/FR support RGB, USB KB, brown box	DK.USB1P.0LW
Keyboard	Primax	Keyboard PRIMAX KBCY21 USB Swiss/G support RGB, USB KB, brown box	DK.USB1P.0LR
Keyboard	Primax	Keyboard PRIMAX KBCY21 USB Thailand support RGB, USB KB, brown box	DK.USB1P.0LK
Keyboard	Primax	Keyboard PRIMAX KBCY21 USB Traditional Chinese support RGB, USB KB, brown box	DK.USB1P.0LY
Keyboard	Primax	Keyboard PRIMAX KBCY21 USB UK support RGB, USB KB, brown box	DK.USB1P.0LQ
Keyboard	Primax	Keyboard PRIMAX KBCY21 USB Ukrainian support RGB, USB KB, brown box	DK.USB1P.0M5
Keyboard	Primax	Keyboard PRIMAX KBCY21 USB US International support RGB, USB KB, brown box, for EMEA	DK.USB1P.0M6
Keyboard	Primax	Keyboard PRIMAX KBCY21 USB US support RGB, USB KB, brown box	DK.USB1P.0LJ

Components	Vendor	Model Name or Key Spec.	Acer Part No.
MB kit	WST	Mainboard Intel H770 (KILLER E3100G) Raptor Lake-S CPU supported	DB.E3R11.001
MB kit	WST	Mainboard Intel H770 (KILLER E3100G) Raptor Lake-S CPU supported	DB.E3R11.002
MEM	ADATA	Memory A-DATA UNB-DIMM DDRV 16GB AM2V52TCSV1-BFHS LF+HF 5200@1.25v XMP Black version	KN.16G0C.008
MEM	ADATA	Memory A-DATA UNB-DIMM DDRV 16GB AO2Y60UCSV1-BHZZ LF+HF 5600@1.1V, 6000@1.35V BLK HS, HY-A, Predator logo	KN.16G0C.015
MEM	ADATA	Memory A-DATA UNB-DIMM DDRV 4800 16GB AM2V48UCSV1-BFFS LF+HF Black version	KN.16G0C.007
MEM	ADATA	Memory A-DATA UNB-DIMM DDRV 4800 8GB AM2V48UC8W1-BFES LF+HF Black version	KN.8GB0C.019
MEM	ADATA	Memory A-DATA UNB-DIMM DDRV 4800 8GB AO2V48UC8W1-BHLS LF+HF SS-B. 1Rx16 Black Heatsink, Predator logo	KN.8GB0C.028
MEM	Kingston	Memory KINGSTON UNB-DIMM DDRV 4800 16GB ACR48U40BS8MA-16F LF+HF black version, MI-A16, Fury logo	KN.16G07.042
Mouse	Primax	PRIMAN USB Mouse MOM2UO support RGB, USB mouse, programmable, brown box	DC.11211.02F
PSU	FSP	PSU FSP FSP850-57SBB 850W Active PFC SFX (125 (W) x 64 (H) x 100 (D)) Gen5	DC.85018.001
SSD	Micron	Flash Disk MICRON SSD NAND 1024GB Micron 2450 1024GB MTFDKBA1T0TFK- 1BC15ABYY LF+HF	KN.01K04.005
SSD	Micron SG	Flash Disk MICRON SSD NAND 512GB Micron 2450 512GB MTFDKBA512TFK- 1BC15ABYY LF+HF	KN.51204.038
SSD	Skhynix	Flash Disk HYNIX SSD NAND 1024GB M.2 2280 BC901 1024G HFS001TEJ9X110N	KN.01K0G.004
SSD	WD	Flash Disk WD SSD NAND 512GB SN740 SDDQNQD-512G-1014 LF+HF	KN.5120D.052
System Fan	CM	Cooler Master Predator FrostBlade 21Q2 12cm ARGB fan DF1202512RFUN Black frame 7 blades 8pcs ARGB Rifel bearing (sleeve)	DC.10911.00P
VGA	PCP	VGA Card NVIDIA RTX 4070Ti GDDRVI 12GB ATX PCI-Ex16 DP DP DP HDMI 288- 1N696-X01A8	DA.40T11.001
VGA	PCP	VGA Card NVIDIA RTX 4070Ti GDDRVI 12GB ATX PCI-Ex16 DP DP DP HDMI 288- 5N696-X01A8 V2	DA.40T11.002
VGA	PCP	VGA Nvidia RTX 4080 DP DP DP HDMI PCP VGA Card NVIDIA RTX 4080 GDDRVI 16GB ATX PCI-Ex16 DP DP DP HDMI	DA.40811.001
WLAN/BT	Intel	Wireless LAN Intel Wi-Fi 6E BT5.2 AX211.NGWG.NV Intel 2x2 M.2 2230 CNVi GFP2 No vPro	KE.WF60N.003

Components	Vendor	Model Name or Key Spec.	Acer Part No.
WLAN/BT	Intel	Wireless LAN Intel Wi-Fi 6E BT5.2 Killer 1675i AX211.NGWG.NVX Intel 2x2 M.2 2230 CNVi GFP2 No vPro	KE.WF60N.005
WLAN/BT	Intel	Wireless LAN Intel Wi-Fi 6E BT5.3 Killer 1690i AX411.NGWG.NVX Intel 2x2DBC M.2 2230 CNVi GFP4 No vPro	KE.WF60N.010

Online Support Information

This appendix describes online technical support services available to help you repair your Acer products.

If you are a distributor, dealer, ASP or TPM, please refer your technical queries to your local Acer branch office. Acer branch offices and regional business units can access our website. However some information sources will require a user ID and password. These can be obtained directly from Acer CSD Taiwan.

Acer's website offers you convenient and valuable support resources whenever you need them.

In the Technical Information section you can download information on all Acer notebook, desktop, All-In-One (AIO) and server models including:

- Service guides for all models
- User's manuals
- Training materials
- BIOS updates
- Software utilities
- Spare parts lists
- TABs (Technical Announcement Bulletin)

For these purposes, we have included a PDF file to facilitate the problem-free downloading of our technical material.

Also available on this website are:

- Detailed information on Acer's International Traveler's Warranty (ITW)
- Returned material authorization procedures
- An overview of all the support services we offer, accompanied by a list of telephone, fax and email contacts for all your technical queries.

We are always looking for ways to optimize and improve our services, so if you have any suggestions or comments, please do not hesitate to communicate these to us.

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