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ASRock Z890I NOVA WIFI

ASRock Phantom Gaming Z890i Nova WiFi Mini ITX Motherboard User Manual

Model: Z890I NOVA WIFI

1. Introduction

This manual provides detailed instructions for the installation, operation, and maintenance of your ASRock Phantom Gaming Z890i Nova WiFi Mini ITX Motherboard. This motherboard is designed for stability, durability, and efficiency, offering reliable performance and user-friendly features for computing tasks.

2. Key Features

- Supports Intel Core Ultra Processors (Series 2) (LGA1851)
- 12+1+1+1+1 Power Phase, 110A SPS for VCore
- Supports BIOS Flashback, Memory OC Shield
- Graphics Output Options: 1 HDMI, 2 Thunderbolt 4 Type-C
- 2 x DDR5 DIMMs Supports Dual Channel, up to 9466+ (OC)
- Integrated WiFi 7 and Bluetooth 5.4
- 5 Gigabit LAN connectivity
- Multiple M.2 NVMe slots, including Gen5 support

3. Product Overview

3.1 Motherboard Layout and Dimensions



Figure 3.1: Top-down view of the ASRock Z890i Nova WiFi Mini ITX Motherboard with key dimensions (6.7" x 6.7").

The ASRock Z890i Nova WiFi is a Mini ITX form factor motherboard, measuring 6.7 inches by 6.7 inches. This compact size makes it ideal for small form factor PC builds.

3.2 Key Components and Connectors

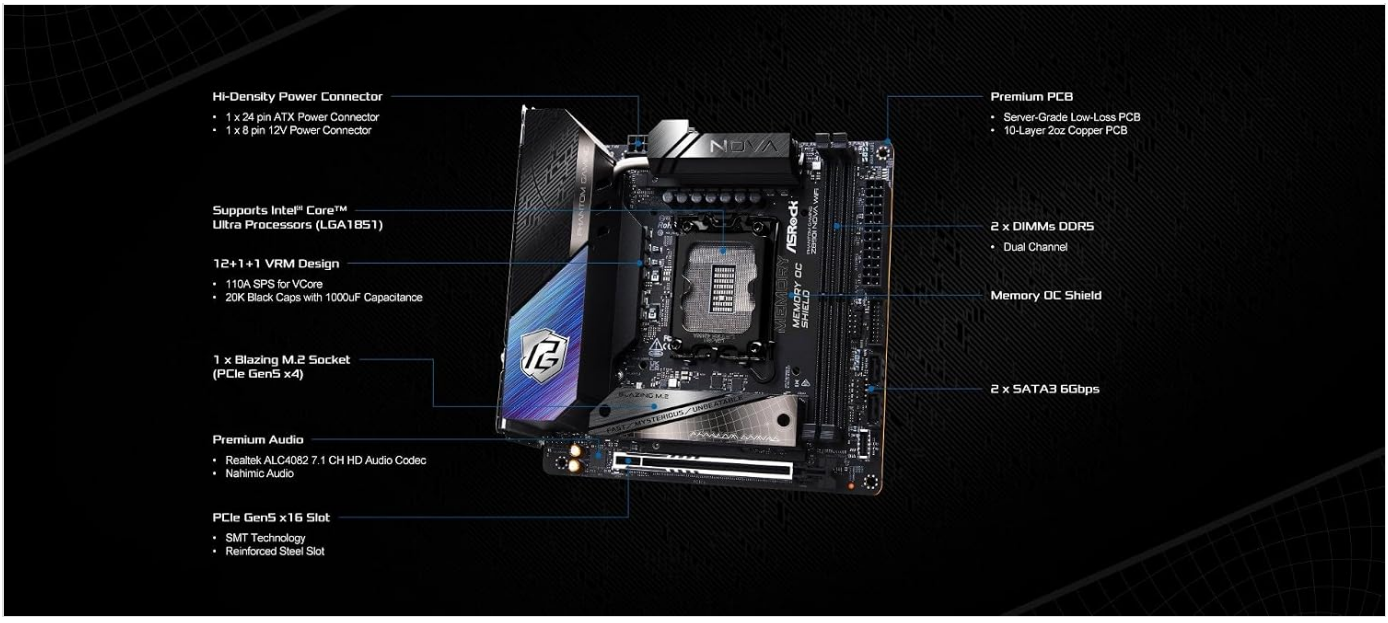

Figure 3.2: Annotated diagram highlighting major components such as the LGA1851 CPU socket, 12+1+1+1+1 power phase design, 2x DDR5 DIMMs, 1x Blazing M.2 Socket (PCIe Gen5 x4), and PCIe Gen5 x16 slot.

This diagram illustrates the primary components and their locations on the motherboard. Key areas include the CPU socket, power delivery system (VRMs), DDR5 memory slots, M.2 storage slots, and the PCIe x16 slot for graphics cards.

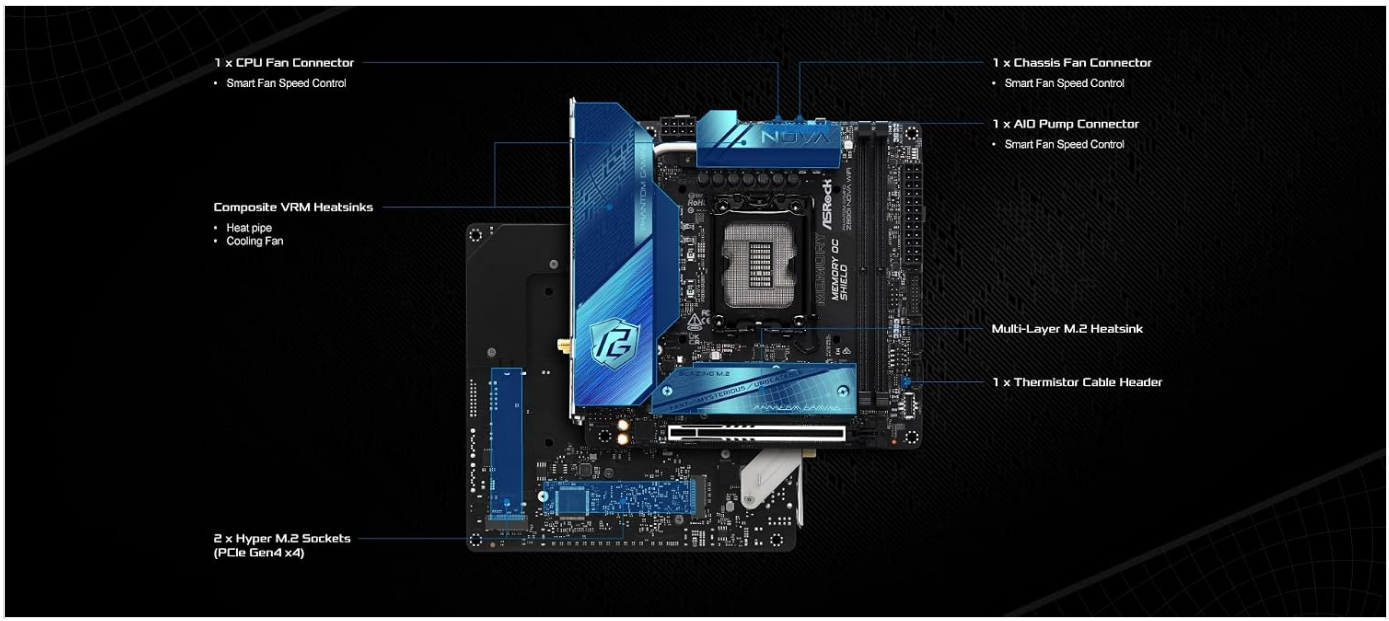

Figure 3.3: Overview of cooling features and additional headers, including CPU fan connector, chassis fan connector, AIO pump connector, thermistor cable header, composite VRM heatsinks, and multi-layer M.2 heatsink.

The motherboard features comprehensive cooling solutions for VRMs and M.2 drives, along with multiple fan headers for system cooling management.

3.3 Rear I/O Panel



Figure 3.4: The rear I/O panel provides various connectivity options including HDMI, two Thunderbolt 4 Type-C ports, multiple USB ports, a 5Gbps LAN port, WiFi 7 and Bluetooth 5.4 antenna connectors, a BIOS Flashback button, and audio jacks.

The integrated I/O shield simplifies installation and provides robust connectivity for peripherals, displays, and network access.

3.4 Motherboard Cooling Design

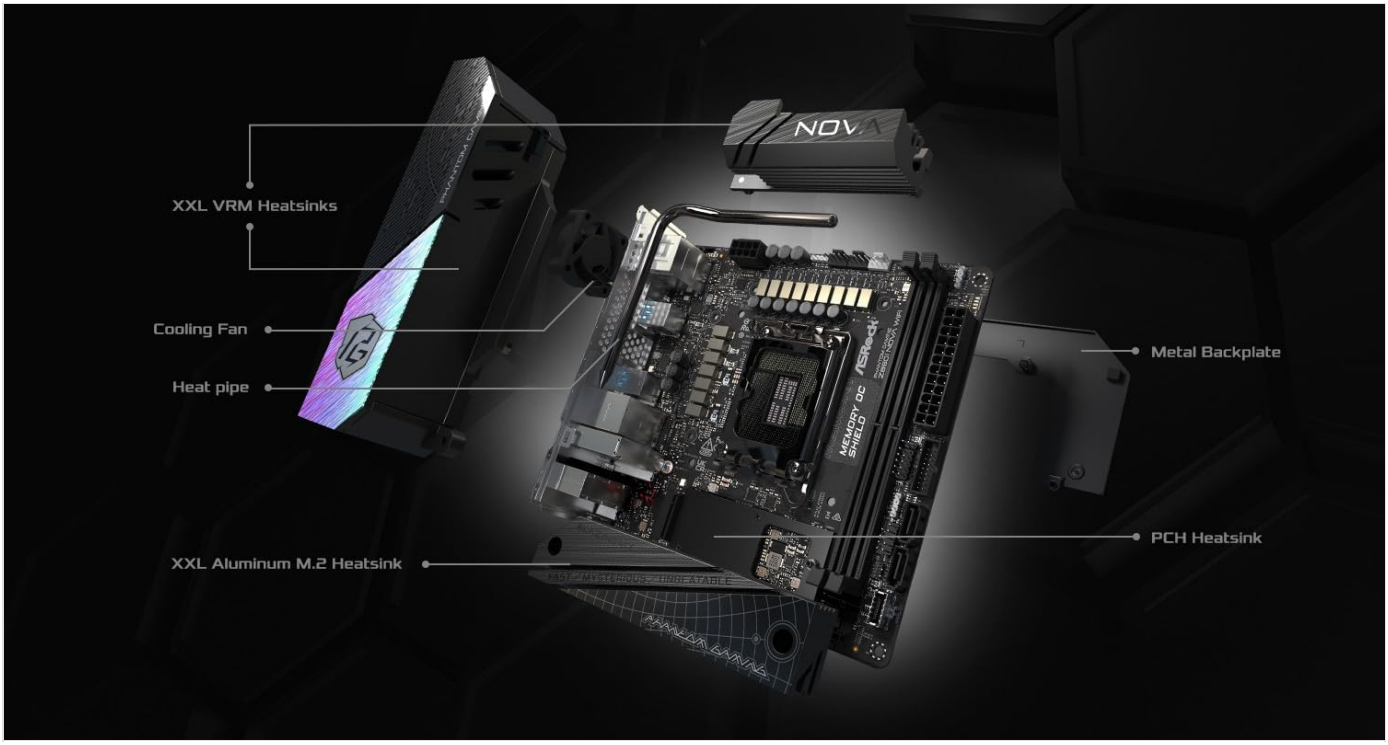

Figure 3.5: Exploded view illustrating the advanced cooling design, featuring XXL VRM heatsinks, a dedicated cooling fan, heat pipes, XXL Aluminum M.2 heatsinks, a PCH heatsink, and a metal backplate for structural rigidity and heat dissipation.

Effective thermal management is crucial for performance. This motherboard incorporates multiple heatsinks and a cooling fan to maintain optimal operating temperatures for critical components.

3.5 Motherboard Backplate



Figure 3.6: The rear of the motherboard features a metal backplate that provides structural support and aids in heat dissipation, particularly around the CPU socket area.

The robust backplate helps prevent PCB bending and improves cooling efficiency by distributing heat away from the CPU area.

3.6 Package Contents

CPU Support List

1. CPU performance may be limited due to system configuration. A top down CPU cooler is recommended.
2. Some CPUs do not have integrated graphics. A PCIe graphics card must be added for output.

Socket	Family	Number	Core	Frequency	FSB	Cache	Power	Validated BIOS	Bootable since BIOS
1851	Core Ultra 9	Ultra 9-285T(B0)	Arrow Lake-S	1.4GHz		36MB	35W	1.38	1.38
1851	Core Ultra 9	Ultra 9-285K(B0)	Arrow Lake-S	3.7GHz		36MB	125W	1.38	1.38
1851	Core Ultra 9	Ultra 9-285(B0)	Arrow Lake-S	2.5GHz		36MB	65W	1.38	1.38
1851	Core Ultra 7	Ultra 7-265T(B0)	Arrow Lake-S	1.5GHz		30MB	35W	1.38	1.38
1851	Core Ultra 7	Ultra 7-265KF(B0)	Arrow Lake-S	3.9GHz		30MB	125W	1.38	1.38
1851	Core Ultra 7	Ultra 7-265K(B0)	Arrow Lake-S	3.9GHz		30MB	125W	1.38	1.38
1851	Core Ultra 7	Ultra 7-265F(B0)	Arrow Lake-S	2.4GHz		30MB	65W	1.38	1.38
1851	Core Ultra 7	Ultra 7-265(B0)	Arrow Lake-S	2.4GHz		30MB	65W	1.38	1.38
1851	Core Ultra 5	Ultra 5-245KF(B0)	Arrow Lake-S	4.2GHz		24MB	125W	1.38	1.38
1851	Core Ultra 5	Ultra 5-245K(B0)	Arrow Lake-S	4.2GHz		24MB	125W	1.38	1.38
1851	Core Ultra 5	Ultra 5-225F(B0)	Arrow Lake-S	3.3GHz		20MB	65W	2.22	2.22
1851	Core Ultra 5	Ultra 5-225(B0)	Arrow Lake-S	3.3GHz		20MB	65W	2.22	2.22
1851	Core Ultra 5	Ultra 5-225(B0)	Arrow Lake-S	3.3GHz		20MB	64W	2.22	2.22
1851	Core Ultra 5	Ultra 5-245(B0)	Arrow Lake-S	3.5GHz		24MB	65W	2.22	2.22
1851	Core Ultra 5	Ultra 5-225F(B0)	Arrow Lake-S	3.3GHz		20MB	64W	2.22	2.22
1851	Core Ultra 5	Ultra 5-235(B0)	Arrow Lake-S	3.4GHz		24MB	65W	2.22	2.22
1851	Core Ultra 5	Ultra 5-225T(B0)	Arrow Lake-S	2.5GHz		20MB	35W	2.22	2.22
1851	Core Ultra 5	Ultra5-235T(B0)	Arrow Lake-S	2.2GHz		24MB	35W	2.22	2.22
1851	Core Ultra 5	Ultra 5-245T(B0)	Arrow Lake-S	2.2GHz		24MB	35W	2.22	2.22
1851	Core Ultra 5	Ultra 5-230F	Arrow Lake-S	3.4GHz		24MB	64W	2.22	2.22

Figure 3.7: The retail package includes the ASRock Z890i Nova WiFi motherboard, a WiFi antenna, SATA data cables, M.2 screws, and a Quick Installation Guide.

Ensure all listed items are present in the package before proceeding with installation.

4. Setup and Installation

Before beginning installation, ensure your workspace is clean and static-free. Always handle the motherboard by its edges and use an anti-static wrist strap.

4.1 CPU Installation (LGA1851 Socket)

1. Locate the LGA1851 CPU socket on the motherboard.
2. Open the CPU socket lever and remove the protective cover.
3. Carefully align the notches on your Intel Core Ultra processor with the keys on the socket.
4. Gently place the CPU into the socket. Do not force it.
5. Close the CPU socket lever to secure the processor.
6. Install your CPU cooler according to its manufacturer's instructions.

4.2 Memory Installation (DDR5 DIMMs)

1. Locate the two DDR5 DIMM slots on the motherboard.
2. Open the retention clips on both ends of the memory slot.

3. Align the notch on the DDR5 memory module with the key in the DIMM slot.
4. Insert the memory module firmly into the slot until the retention clips snap into place.
5. Ensure both clips are fully closed and the module is seated correctly.

4.3 Storage Installation

4.3.1 M.2 NVMe SSDs

The motherboard supports multiple M.2 NVMe SSDs, including a Gen5 slot for maximum performance.

1. Locate the M.2 slots, typically covered by heatsinks.
2. Remove the M.2 heatsink and its protective film.
3. Insert the M.2 SSD into the slot at an angle.
4. Gently push down the SSD and secure it with the provided screw or tool-less mechanism.
5. Reattach the M.2 heatsink.

4.3.2 SATA Drives

Connect SATA data cables from your SATA SSDs or HDDs to the SATA ports on the motherboard. Connect power cables from your power supply to the drives.

4.4 PCIe Card Installation

The motherboard features a PCIe Gen5 x16 slot for your graphics card.

1. Locate the PCIe x16 slot.
2. Open the retention clip at the end of the slot.
3. Align your graphics card with the slot and press it firmly until it clicks into place.
4. Secure the graphics card to your PC case with screws.
5. Connect any necessary PCIe power cables from your power supply to the graphics card.

4.5 Power Connections

Connect the 24-pin ATX power connector and the 8-pin CPU power connector from your power supply to the corresponding ports on the motherboard.

4.6 Front Panel Connections

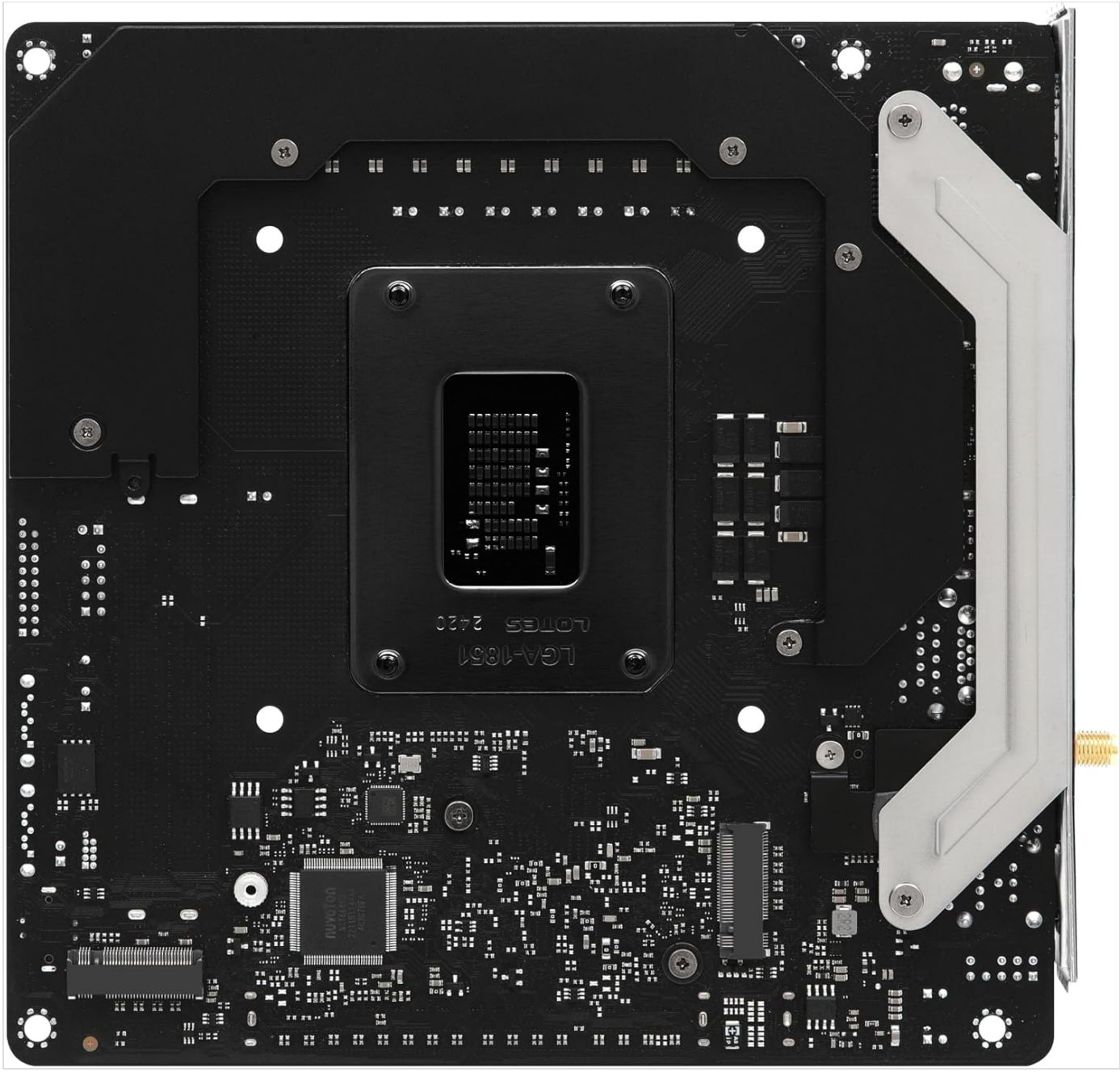

Figure 3.8: The Front Panel USB 3.2 Gen2x2 Type-C Header supports up to 20 Gbps data transfer rates, providing fast connectivity for compatible front panel devices.

Connect your PC case's front panel cables (power button, reset button, USB ports, audio jacks) to the corresponding headers on the motherboard. Refer to the motherboard manual for exact pin layouts.

5. Operating Instructions

5.1 BIOS Setup

To enter the BIOS setup utility, power on your system and repeatedly press the `F2` or `Delete` key during the Power-On Self-Test (POST) process. Here you can configure system settings, boot order, and monitor hardware status.

5.2 BIOS Update

Keeping your BIOS updated ensures optimal performance, compatibility, and security. The ASRock Z890i Nova WiFi motherboard supports two primary methods for BIOS updates: USB BIOS Flashback and Instant Flash.

5.2.1 USB BIOS Flashback Method

This method allows you to update the BIOS without a CPU, RAM, or graphics card installed. It requires a USB drive formatted to FAT32.

1. Prepare a USB drive (at least 32 GB, formatted to FAT32).
2. Download the latest BIOS file from the official ASRock website for your specific motherboard model.
3. Extract the downloaded zip file. Rename the BIOS ROM file to "CREATIVE.ROM" and copy it to the root directory of your FAT32-formatted USB drive.
4. Turn off the power supply's AC switch for 3 minutes, then turn it back on. Do not power on the system.
5. Insert the USB drive into the designated USB BIOS Flashback port on the rear I/O panel (refer to your motherboard manual for the exact port location).
6. Press and hold the USB BIOS Flashback button on the rear I/O for about three seconds until the LED light starts to blink.
7. The BIOS update procedure will take a few minutes. Wait until the LED stops blinking, indicating that the BIOS update has been completed. If the LED light turns solid green, the BIOS Flashback is not operating properly.
8. Turn on the system and press `F2` or `Delete` during POST to enter the BIOS setup menu and verify the updated BIOS version.

5.2.2 Instant Flash Method

This method updates the BIOS from within the BIOS setup utility using a USB drive.

1. Prepare a USB drive (at least 32 GB, formatted to FAT32).
2. Download the latest BIOS file from the official ASRock website for your specific motherboard model.
3. Extract the downloaded zip file and copy the BIOS ROM file to the root directory of your FAT32-formatted USB drive.
4. Insert the USB drive into any USB port on the motherboard.
5. Turn on the system and press `F2` or `Delete` during POST to enter the BIOS setup menu.
6. Go to the "Tool" menu and select "Instant Flash" to execute it.
7. Confirm any notices (e.g., suspend BitLocker) and proceed.
8. ASRock Instant Flash will automatically detect the BIOS file on your USB drive. Select the appropriate BIOS version and click "Yes" to update.
9. Do not power off the system during the UEFI update. Once complete, it will show "Programming success. Press Enter to reboot system." Click "OK" to reboot.
10. After the system restarts, press `F2` to enter the BIOS setup menu during POST.
11. Go to the "Exit" menu, select "Load UEFI Default," and press "Yes" to continue.
12. Select "Save Changes and Exit" and press "Yes" to exit the BIOS setup menu. The system will now boot up with the new BIOS.

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Video 5.1: Official ASRock Motherboard BIOS Update Tutorial. This video demonstrates both USB BIOS Flashback and Instant Flash methods for updating your motherboard's firmware.

5.3 Network Connectivity

- **Wired LAN:** Connect an Ethernet cable to the 5Gbps LAN port on the rear I/O panel for high-speed wired network access.
- **Wireless (WiFi 7):** Install the included WiFi antenna to the connectors on the rear I/O panel. The motherboard supports WiFi 7 for advanced wireless networking, including the 6GHz band.
- **Bluetooth 5.4:** The integrated Bluetooth 5.4 allows for wireless connection to compatible peripherals such as headphones, keyboards, and mice.

5.4 Thunderbolt 4 Type-C Ports

The two Thunderbolt 4 Type-C ports on the rear I/O panel offer versatile connectivity with data transfer speeds up to 40 Gbps. These ports support various devices, including high-speed storage, external displays (if your CPU has integrated graphics), and docking stations.

6. CPU Support List



Figure 3.9: Partial CPU Support List. For the complete and most up-to-date list, please visit the official ASRock website.

This table provides a reference for compatible Intel Core Ultra Processors. CPU performance may be limited by system configuration. A top-down CPU cooler is recommended. Some CPUs do not have integrated graphics; a PCIe graphics card must be added for output.

7. Specifications

Feature	Detail
Brand	ASRock
Model Name	Z890I NOVA WIFI
CPU Socket	LGA 1851
Compatible Processors	Intel Core Ultra
Chipset Type	Intel Z890
RAM Memory Technology	DDR5
Memory Clock Speed	9466 MHz (OC)
Memory Storage Capacity	128 GB
Graphics Output	1 HDMI, 2 Thunderbolt 4 Type-C
Network Connectivity	WiFi 7, Bluetooth 5.4, 5Gbps LAN
Platform	Windows 11
Package Dimensions	9.14 x 7.76 x 3.78 inches
Item Weight	2.88 pounds

8. Troubleshooting

If you encounter issues with your motherboard, consider the following general troubleshooting steps:

- **No Power/No Display:**
  - Ensure all power cables (24-pin ATX, 8-pin CPU, PCIe for GPU) are securely connected.
  - Verify that the power supply is switched on and functioning.
  - Check monitor connections and ensure the monitor is powered on and set to the correct input.
  - If using a CPU without integrated graphics, ensure a dedicated graphics card is properly installed and powered.
- **System Instability/Crashes:**
  - Check RAM seating and ensure modules are fully inserted. Test with one RAM stick at a time.
  - Ensure CPU cooler is properly installed and making good contact with the CPU. Monitor CPU temperatures.
  - Update BIOS to the latest version (refer to Section 5.2).
  - Verify that all drivers for motherboard components are installed and up-to-date.
- **Storage Not Detected:**
  - For M.2 SSDs, ensure they are fully seated and secured. Check if the M.2 slot is enabled in BIOS.
  - For SATA drives, ensure data and power cables are securely connected. Check SATA port status in BIOS.
- **Network Connectivity Issues:**
  - For wired LAN, ensure the Ethernet cable is connected and the router/modem is functioning. Check LAN drivers.
  - For WiFi, ensure the antenna is securely attached. Check WiFi drivers and network settings in your operating system.

For more specific troubleshooting or persistent issues, consult the detailed manual available on the ASRock website or contact ASRock technical support.

9. Maintenance

Proper maintenance can extend the lifespan and ensure the stable operation of your motherboard:

- **Keep it Clean:** Regularly clean dust from your PC case and motherboard components using compressed air. Ensure fans and heatsinks are free from obstructions.
- **Ventilation:** Ensure adequate airflow within your PC case to prevent overheating.
- **BIOS Updates:** Periodically check the ASRock website for new BIOS versions and update as recommended to improve stability and compatibility.
- **Driver Updates:** Keep all system drivers (chipset, audio, LAN, etc.) updated to ensure optimal performance and resolve potential issues.

10. Warranty and Support

This ASRock motherboard comes with a manufacturer's warranty. For detailed warranty terms, conditions, and duration, please refer to the warranty card included in your product packaging or visit the official ASRock website.
For technical support, driver downloads, BIOS updates, and product information, please visit the official ASRock support website:

www.asrock.com

You may also contact ASRock customer service for assistance with product-related inquiries.

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