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ASRock B850 PRO RS

ASRock AMD AM5 B850 Pro RS Motherboard Instruction Manual

Model: B850 PRO RS | Brand: ASRock

1. Product Overview

The ASRock AMD AM5 B850 Pro RS Motherboard is designed to support AMD Ryzen 9000, 8000, and 7000 Series processors, offering robust performance and extensive connectivity. It features 4 DDR5 slots supporting up to 8000MHz, a 24-pin power connection, ATX form factor, 21 USB ports, and PCIe 5.0 for advanced graphics and storage solutions.

Key Features

- Supports AMD Ryzen 9000, 8000 and 7000 Series processors
- AMD B850 chipset
- 4 x DDR5 DIMM slots, up to 256 GB total memory
- PCIe 5.0 x16 slot for graphics cards
- 3 x M.2 slots for fast SSD storage
- 2.5 Gigabit LAN
- HDMI 2.1 connection
- 21x USB ports, including USB 3.2 Gen2x2 Type-C
- ATX Form Factor (12" x 9.6")
- 14+2+1 phase power supply



Front view of the ASRock AMD AM5 B850 Pro RS Motherboard, showcasing its layout and heatsinks.

Official video providing an overview of the AMD B850 Series Motherboards, including the Pro RS model.

2. Setup and Installation

Motherboard Layout



Detailed diagram of the ASRock B850 Pro RS Motherboard highlighting key components like CPU socket, DDR5 slots, M.2 slots, and power connectors.

CPU Installation

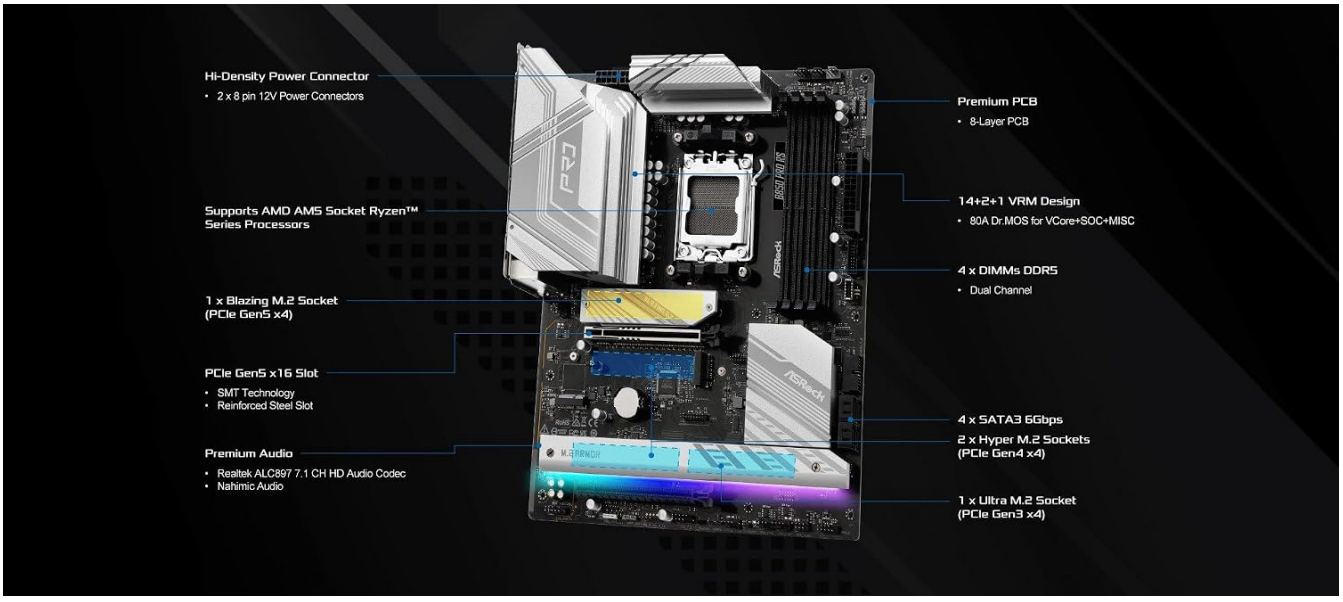
Carefully align your AMD AM5 processor with the socket. Ensure the triangular mark on the CPU matches the mark on the socket. Gently lower the CPU into the socket without forcing it. Close the retention arm to secure the CPU.

Memory (RAM) Installation

Open the clips on both ends of the DDR5 DIMM slots. Align the notch on the memory module with the key in the DIMM slot. Press down firmly on both ends of the memory module until the clips snap into place. For optimal performance, install memory modules in the recommended dual-channel configuration as per the user manual.

Storage Device Installation

The motherboard supports 3 M.2 slots for NVMe SSDs and multiple SATA 6Gbps ports for traditional hard drives or SSDs. For M.2 SSDs, remove the M.2 heatsink, insert the SSD into the slot, and secure it with the provided screw or tool-less mechanism. Reattach the heatsink. For SATA drives, connect the SATA data cable to the motherboard and the drive, and connect a SATA power cable from your power supply to the drive.



Close-up view of the M.2 slots on the ASRock B850 Pro RS Motherboard, indicating support for fast NVMe SSD storage.

Graphics Card Installation

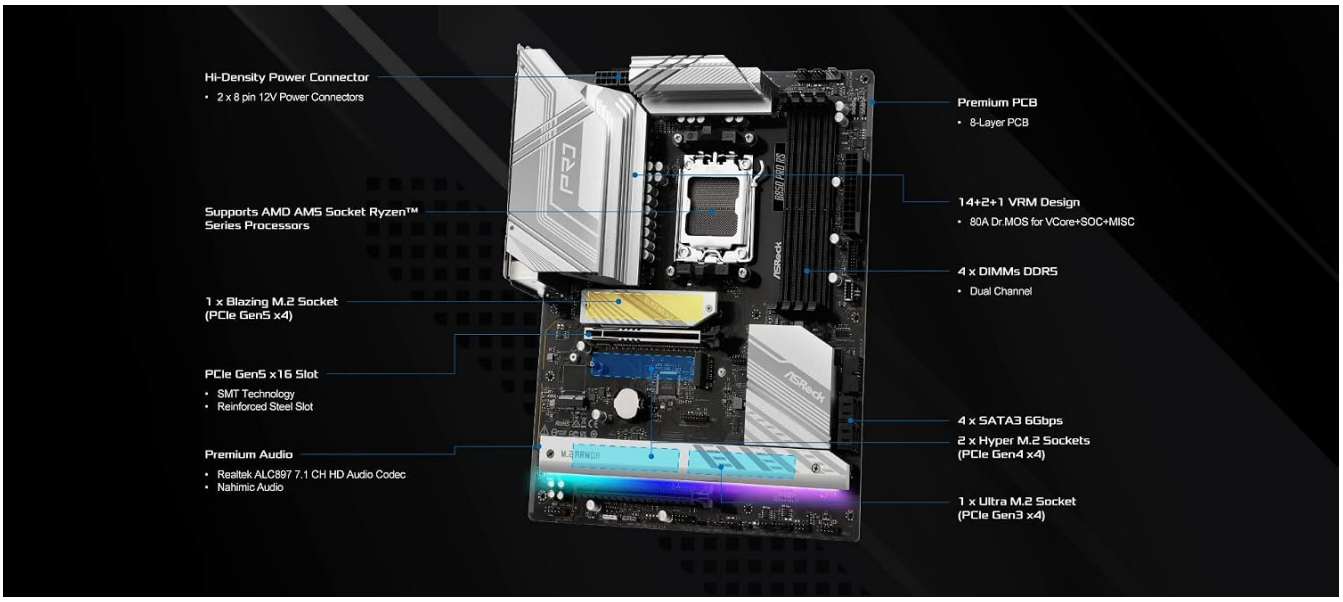
Insert your PCIe 5.0 x16 graphics card into the primary PCIe slot. Ensure it is seated firmly and the retention clip locks. Secure the card to your chassis with screws. Connect any necessary PCIe power cables from your power supply to the graphics card.

Power Connections

Connect the 24-pin ATX power connector from your power supply to the corresponding header on the motherboard. Also, connect the 8-pin (or 4+4-pin) CPU power connector to the motherboard. Ensure all power connections are secure.

Connecting Peripherals

Connect your monitor to the HDMI 2.1 port on the rear I/O panel. Utilize the 21x USB ports, including USB 3.2 Gen2x2 Type-C, for your keyboard, mouse, and other USB devices. Connect your Ethernet cable to the 2.5 Gigabit LAN port for network access.



Rear I/O panel of the ASRock B850 Pro RS Motherboard, showing various USB ports, HDMI, LAN, and audio jacks.

3. Operating Instructions

Initial Boot-Up

After all components are installed and connected, power on your system. During the Power-On Self-Test (POST), repeatedly press the **Delete** or **F2** key to enter the BIOS/UEFI setup utility. This allows you to configure system settings.

BIOS/UEFI Settings

The BIOS/UEFI interface allows you to adjust various system parameters, including boot order, CPU settings, memory profiles (e.g., EXPO), fan speeds, and storage configurations. Refer to the detailed user manual for specific settings and their functions.

Network Configuration

The motherboard features a 2.5 Gigabit LAN port for high-speed wired network connectivity. Ensure your operating system drivers are installed for optimal performance. For wireless connectivity (if using a Wi-Fi variant), install the necessary drivers and connect to your preferred network.

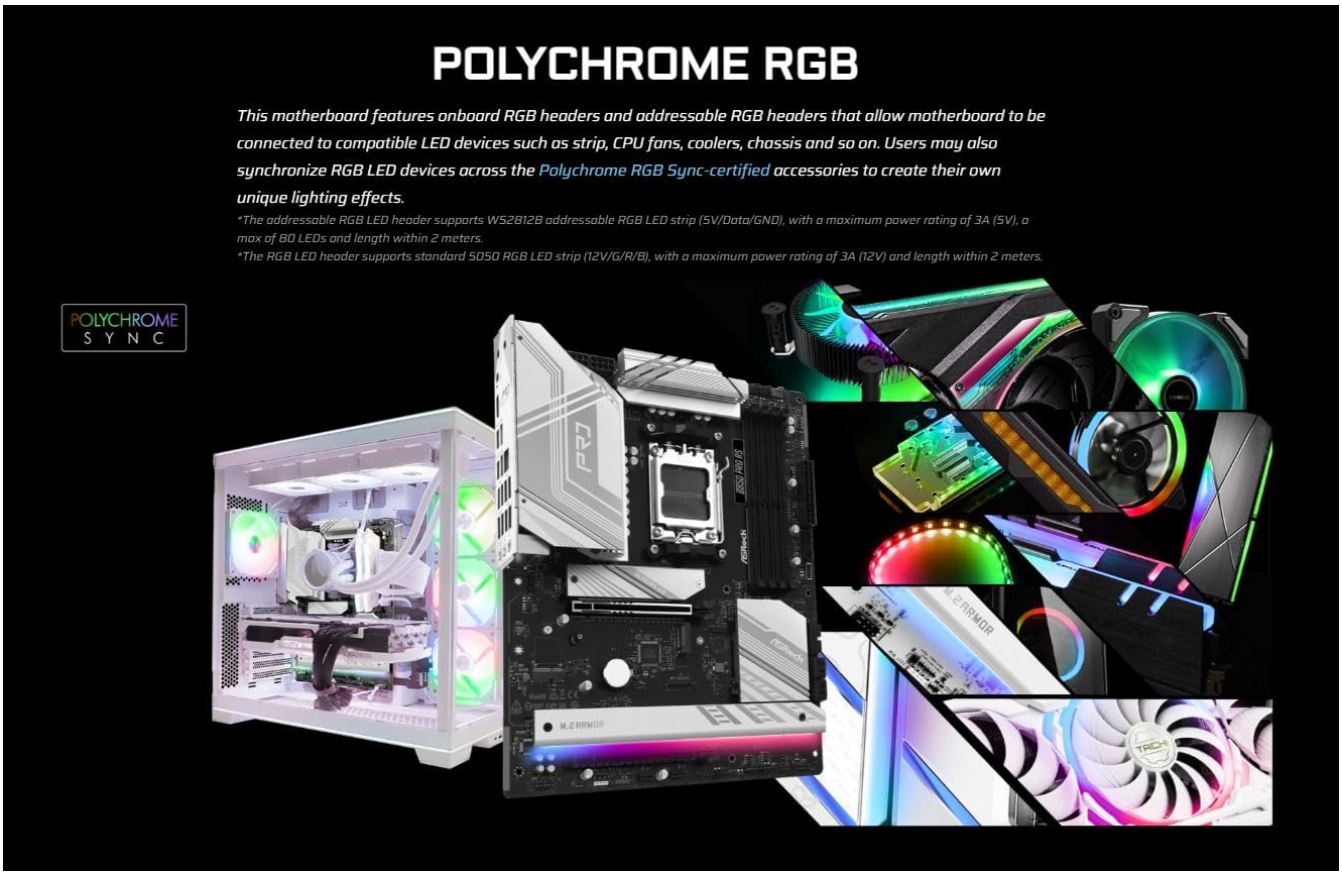


Illustration highlighting the 2.5 Gigabit LAN feature for high-speed network connectivity.

RGB Lighting Control

The ASRock B850 Pro RS Motherboard supports Polychrome RGB, allowing you to customize the lighting effects of compatible LED devices connected to the motherboard. Use the ASRock Polychrome SYNC software to synchronize and control your RGB components.

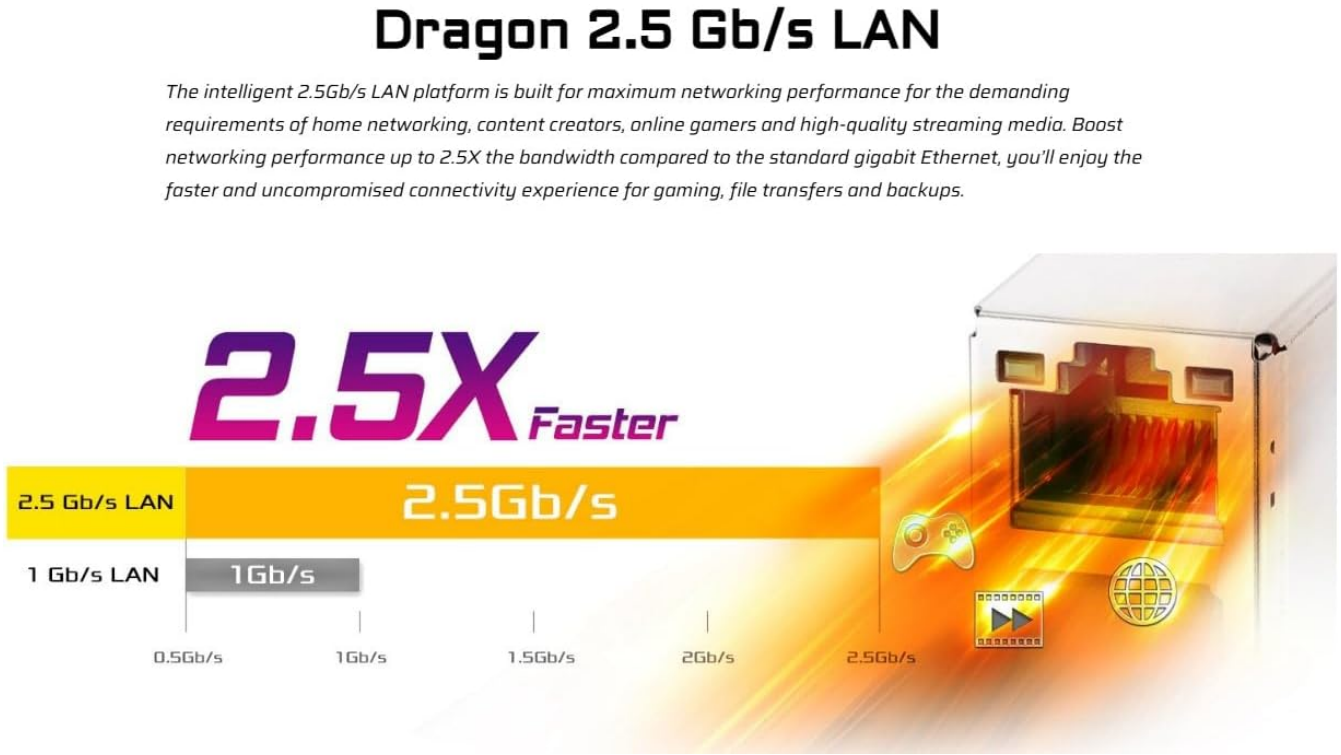


Diagram illustrating the Polychrome RGB lighting capabilities of the motherboard, allowing customization of LED devices.

4. Maintenance

BIOS Update Procedures

Keeping your BIOS updated is crucial for system stability, compatibility with new hardware, and access to the latest features. ASRock provides two primary methods for updating the BIOS: USB BIOS Flashback and Instant Flash. Refer to the video tutorial below for detailed instructions on both methods.

Detailed tutorial on how to update your ASRock Motherboard's BIOS using USB BIOS Flashback and Instant Flash methods.

General Cleaning

Regularly clean your motherboard and PC components to prevent dust buildup, which can lead to overheating and performance issues. Use compressed air to remove dust from heatsinks, fans, and crevices. Ensure the system is powered off and unplugged before cleaning. Avoid using liquid cleaners directly on components.

5. Troubleshooting

Common Issues

- **No Power/No POST:** Double-check all power connections (24-pin ATX, 8-pin CPU, GPU power). Ensure RAM modules are correctly seated. Try booting with minimal components (CPU, one RAM stick, GPU).
- **System Instability/Crashes:** This can often be related to memory. Verify RAM is compatible and running at stable speeds (check EXPO settings in BIOS). Ensure CPU cooler is properly installed and making good contact. Update drivers for all components.
- **Peripheral Detection Issues:** If USB devices or other peripherals are not detected, ensure they are connected to the correct ports. Check BIOS settings for USB controller status. Update chipset drivers.
- **BIOS Update Failure:** If a BIOS update fails, refer to the USB BIOS Flashback procedure as it can often recover from such situations without needing a working CPU or RAM.

Contact Support

If you encounter persistent issues that cannot be resolved using the troubleshooting steps, please visit the official ASRock support page for further assistance: ASRock Support

6. Technical Specifications

Feature	Specification
CPU Socket	Socket AM5
Compatible Processors	AMD Ryzen 9000, 8000, 7000 Series
Chipset Type	AMD B850
RAM Memory Technology	DDR5
Memory Clock Speed	Up to 8000 MHz
DDR5 DIMM Slots	4 (Max 256 GB)
PCIe Slots	1 x PCIe 5.0 x16

M.2 Slots	3
LAN	2.5 Gigabit LAN
USB Ports	21x (including USB 3.2 Gen2x2 Type-C)
Video Output	HDMI 2.1
Form Factor	ATX (12" x 9.6")
Power Design	14+2+1 Phase

CPU Support List

Socket	Family	Model	Power	Core	Frequency	L2 Cache	L3 Cache	CPU Rev.	Validated BIOS	Bootable since BIOS
AM5	Ryzen 9	9950X(100-000001277)	170W	Granite Ridge	4.3GHZ	16MB	64MB		3.11	3.11
AM5	Ryzen 9	9950X3D(100-000000719)	170W	Granite Ridge	4.3GHz	16MB	128MB		3.15	3.10
AM5	Ryzen 9	9900X3D(100-000001368)	120W	Granite Ridge	4.4GHz	12MB	128MB		3.15	3.10
AM5	Ryzen 9	9900X(100-000000662)	120W	Granite Ridge	4.4GHz	12MB	64MB		3.11	3.11
AM5	Ryzen 7	9800X3D(100-000001084)	120W	Granite Ridge	4.7GHz	8MB	96MB		3.11	3.11
AM5	Ryzen 7	9700X(100-000001404)	65W	Granite Ridge	3.8GHz	8MB	32MB		3.11	3.11
AM5	Ryzen 5	9600X(100-000001405)	65W	Granite Ridge	3.9GHz	6MB	32MB		3.11	3.11
AM5	Ryzen 5	9600(100-000000718)	65W	Granite Ridge	3.8GHz	6MB	32MB		3.15	3.10
AM5	Ryzen 7 PRO	PRO 8700GE(100-000001240)	35W	Phoenix 1	3.65GHz	8MB	16MB		3.11	3.11
AM5	Ryzen 7 PRO	PRO 8700G(100-000001238)	65W/45W	Phoenix 1	4.2GHz	8MB	16MB		3.11	3.11
AM5	Ryzen 7	8700F(100-000001590)	65W/45W	Phoenix 1	4.1GHz	8MB	16MB		3.11	3.11
AM5	Ryzen 7	8700G(100-000001236)	65W/45W	Phoenix 1	4.2GHz	8MB	16MB		3.11	3.11
AM5	Ryzen 5 PRO	PRO 8600GE(100-000001241)	35W	Phoenix 1	3.9GHz	6MB	16MB		3.11	3.11
AM5	Ryzen 5 PRO	PRO 8600G(100-000001239)	65W/45W	Phoenix 1	4.35GHz	6MB	16MB		3.11	3.11
AM5	Ryzen 5	8400F(100-000001591)	65W/45W	Phoenix 1	4.2GHz	6MB	16MB		3.11	3.11
AM5	Ryzen 5	8600G(100-000001237)	65W/45W	Phoenix 1	4.3GHZ	6MB	16MB		3.11	3.11
AM5	Ryzen 5 PRO	PRO 8500GE(100-000001185)	35W	Phoenix 2	3.4GHz	6MB	16MB		3.11	3.11
AM5	Ryzen 5 PRO	PRO 8500G(100-000001183)	65W/45W	Phoenix 2	3.55GHz	6MB	16MB		3.11	3.11
AM5	Ryzen 5	8500GE(100-000001184)	35W	Phoenix 2	3.4GHz	6MB	16MB		3.11	3.11
AM5	Ryzen 5	8500G(100-000000931)	65W/45W	Phoenix 2	3.5GHz	6MB	16MB		3.11	3.11
AM5	Ryzen 3 PRO	PRO 8300GE(100-000001189)	35W	Phoenix 2	3.5GHz	4MB	8MB		3.11	3.11
AM5	Ryzen 3 PRO	PRO 8300G(100-000001187)	65W/45W	Phoenix 2	3.45GHz	4MB	8MB		3.11	3.11
AM5	Ryzen 3	8300GE(100-000001188)	35W	Phoenix 2	3.5GHz	4MB	8MB		3.11	3.11
AM5	Ryzen 3	8300G(100-000001186)	65W/45W	Phoenix 2	3.45GHz	4MB	8MB		3.11	3.11
AM5	Ryzen 9	7950X3D(100-000000908)	120W	Raphael	4.2GHz	16MB	128MB		3.11	3.11
AM5	Ryzen 9	7900X3D(100-000000909)	120W	Raphael	4.4GHz	12MB	128MB		3.11	3.11
AM5	Ryzen 9	7950X(100-000000514-00)	170W	Raphael	4.5GHz	16MB	64MB		3.11	3.11
AM5	Ryzen 9	7900X(100-000000589-00)	170W	Raphael	4.7GHz	12MB	64MB		3.11	3.11
AM5	Ryzen 9	7900(100-000000590)	65W	Raphael	3.7GHz	12MB	64MB		3.11	3.11
AM5	Ryzen 9	Pro 7945(100-000000598)	65W	Raphael	3.7GHz	12MB	64MB		3.11	3.11
AM5	Ryzen 7	Pro 7745(100-000000599)	65W	Raphael PRO	3.8GHz	8MB	32MB		3.11	3.11
AM5	Ryzen 7	7800X3D(100-000000910)	120W	Raphael	4.2GHz	8MB	96MB		3.11	3.11
AM5	Ryzen 7	7700X(100-000000591-00)	105W	Raphael	4.5GHz	8MB	32MB		3.11	3.11
AM5	Ryzen 7	7700(100-000000592)	65W	Raphael	3.8GHz	8MB	32MB		3.11	3.11
AM5	Ryzen 5	Pro 7645(100-000000600)	65W	Raphael	3.8GHz	6MB	32MB		3.11	3.11
AM5	Ryzen 5	7600X(100-000000593-00)	105W	Raphael	4.7GHz	8MB	32MB		3.11	3.11
AM5	Ryzen 5	7600(100-000001015)	65W	Raphael	3.8GHz	6MB	32MB		3.11	3.11
AM5	Ryzen 5	7500F(100-000000597)	65W	Raphael	3.7GHz	6MB	32MB		3.11	3.11
AM5	Ryzen 5	7600X3D(100-000001721)	65W	Raphael	4.1GHz	6MB	96MB		3.11	3.11
AM5	Ryzen 5	7400F(100-000001845)	65W	Raphael	3.7GHz	6MB	32MB		3.15	3.10
AM5	Ryzen 9 PRO	PRO 9945(100-000001407)	65W	Granite Ridge PRO	3.4GHz	12MB	64MB		3.30	3.30
AM5	Ryzen 7 PRO	PRO 9745(100-000001408)	65W	Granite Ridge PRO	3.8GHz	8MB	32MB		3.30	3.30
AM5	Ryzen 7	9700F(100-000001902)	65W	Granite Ridge	3.8GHz	8MB	32MB		3.30	3.30
AM5	Ryzen 5 PRO	PRO 9645(100-000001409)	65W	Granite Ridge PRO	3.9GHz	6MB	32MB		3.30	3.30
AM5	Ryzen 5	7400(100-000001900)	65W	Raphael	3.3GHz	6MB	16MB		3.30	3.30
AM5	Ryzen 5 PRO	PRO 7445(100-000001899)	65W	Raphael	3.3GHz	6MB	16MB		3.30	3.30
AM5	Ryzen 5	9500F(100-000001406)	65W	Granite Ridge	3.8GHz	6MB	32MB		3.30	3.30

Table detailing supported AMD Ryzen processors for the AM5 socket, including model numbers, power, core, frequency, cache, and compatible BIOS versions.



Top-down view of the ASRock B850 Pro RS Motherboard with dimensions (12" x 9.6") indicated.

7. Warranty and Support

Warranty Information

For detailed warranty information regarding your ASRock AMD AM5 B850 Pro RS Motherboard, please refer to the warranty card included in your product packaging or visit the official ASRock website. Warranty terms and conditions may vary by region and retailer.

Customer Support

For technical support, driver downloads, and additional product information, please visit the ASRock official support page or contact their customer service directly. You can find more resources at the ASRock Store on Amazon.

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