

2026 PC Upgrade & GPU + ATX 3.1 PSU Compatibility Checklist (1080p / 1440p / 4K Build Sheet & BIOS/Airflow Pre-Flight Check)

Use this 2-page bench worksheet before ordering a graphics card or power supply. Audit your resolution VRAM floor, calculate ATX 3.1 transient wattage headroom, verify 12V-2x6 (H++) connector and case clearance in millimeters, and follow the clean BIOS/driver pre-flight sequence.

TARGET MONITOR SPEC
Res: _____ · Hz: _____

CURRENT / TARGET CPU
Model: _____

TARGET GPU CANDIDATE
Model: _____

CURRENT PSU & CASE
PSU: _____ W · Max mm: _____

1. 1080p / 1440p / 4K GPU Target & Platform Bottleneck Audit

STEP 1 · RESOLUTION & VRAM FLOOR

- [] Lock Resolution & Frame-Rate Target First: Match the GPU tier to your monitor's native resolution and refresh window (144Hz–240Hz+ esports vs. 60–120Hz AAA path tracing).

[] CPU & RAM Frame-Time Balance: Verify your CPU (e.g., AM5 X3D / Ryzen 9000 / Core Ultra / 13th-14th Gen) and dual-channel DDR5/DDR4 won't bottleneck 1% lows at 1080p/1440p.
- [] Enforce 2026 VRAM Floors: 12GB minimum for high-refresh 1080p / entry 1440p; **16GB sweet spot** for longevity at 1440p Ultra + RT; 16GB–32GB for native 4K.

[] Motherboard PCIe Slot & Display Output Check: Confirm primary top x16 slot runs at PCIe 4.0/5.0 x16 and monitor cable matches DisplayPort 2.1 / 1.4a DSC or HDMI 2.1 bandwidth.

RESOLUTION TIER	VRAM FLOOR (2026)	REFERENCE GPU CLASS (RTX 50 / RX 9000)	TYPICAL BOARD TGP	RECOMMENDED ATX 3.1 PSU	YOUR TARGET / NOTES
1080p High-FPS / Entry 1440p	12GB GDDR6/GDDR7	RX 9070 (220W) / RTX 5070 (250W)	220W – 250W	650W – 750W ATX 3.1	[] Selected · Model: _____
1440p Ultra + Ray Tracing Sweet Spot	16GB GDDR6/GDDR7	RTX 5070 Ti (300W) / RX 9070 XT (304W)	300W – 304W	750W – 850W ATX 3.1	[] Selected · Model: _____
1440p 240Hz OLED / 4K High-Refresh	16GB GDDR7	RTX 5080 (360W)	360W	850W ATX 3.1 (Native 12V-2x6)	[] Selected · Model: _____
4K Flagship Path Tracing & Creator	32GB GDDR7	RTX 5090 (575W)	575W	1000W – 1200W ATX 3.1	[] Selected · Model: _____

2. ATX 3.1 & Native 12V-2x6 (H++) PSU Sizing Worksheet

STEP 2 · TRANSIENT HEADROOM & CONNECTOR SAFETY

ATX 3.1 Transient Headroom Formula: Modern GPUs produce sub-millisecond power excursions up to 1.8x–2.0x TGP. Size continuous PSU capacity using a **1.30x system headroom multiplier** and verify ATX 3.1 / PCIe 5.1 certification: **Recommended PSU Tier (W) = (GPU TGP + CPU PPT/PL2 + 95W System Overhead) × 1.30**

- [] Native 12V-2x6 (H++) Cable Over Dongles: For NVIDIA RTX 50-series cards, use a native ATX 3.1 PSU with a single 600W-rated 12V-2x6 cable (recessed sense pins, shorter terminals) instead of multi-8-pin octopus adapters.

[] 35mm Straight Cable Bend Rule: Leave at least **35mm (1.38 in)** of straight run from the 12V-2x6 plug before bending toward the tempered-glass side panel; confirm zero visible gap on the connector latch.
- [] Dedicated PCIe 8-Pin Cables (AMD RX 9000): For dual/triple 8-pin GPUs (RX 9070 / 9070 XT), run separate 8-pin cables from the PSU—never daisy-chain a single pigtail above 225W total board draw.

[] PSU Age & Hold-Up Time Audit: If your existing PSU is pre-ATX 3.0 or older than 6–7 years, upgrade alongside a 300W+ GPU rather than risking OCP/UVF black-screen trips under transient load.

BUILD POWER COMPONENT	REFERENCE RANGE	YOUR COMPONENT MODEL	SUSTAINED PEAK DRAW (WATTS)
1. Graphics Card TGP (Board Power)	220W (RX 9070) to 575W (RTX 5090)	_____	_____ W
2. CPU Package Power (PPT / PL2 Peak)	88W (65W TDP) · 142W–170W (X3D/AM5) · 253W (i7/i9/Ultra)	_____	_____ W
3. Motherboard, DDR5, NVMe, Fans & AIO	Fixed 95W baseline (or 130W with RGB + 360mm AIO + 3+ NVMe)	Overhead Allowance	+ 95 W
STEP A: Combined Sustained System Peak (1 + 2 + 3)		Sustained System Peak:	= _____ W
STEP B: Multiply by 1.30 (30% Continuous Headroom) & Round Up to Standard ATX 3.1 Tier		Target ATX 3.1 PSU Tier (650/750/850/1000/1200W):	= _____ W

Front Radiator Clearance Formula: Case spec sheets list max GPU length with *front fans only*. If you mount a front AIO radiator, subtract radiator core thickness (typically 27mm–38mm): **Effective Max GPU Length (mm) = Case Spec Max GPU (mm) – Front Radiator Thickness (mm)** (aim for ≥ 15mm install margin).

MECHANICAL DIMENSION	TYPICAL 2026 PARTNER CARD RANGE	YOUR CASE LIMIT	TARGET CARD SPEC	NET MARGIN (LIMIT – CARD)	PASS / ACTION
GPU Length (mm)	242mm (2-fan) · 304–336mm (3-fan) · 358mm (flagship)	_____ mm	_____ mm	_____ mm (want ≥15mm)	[] PASS [] Tight
PCIe Slot Thickness	2.0–2.5 slots (midrange) · 3.0–3.8 slots (OC flagships)	_____ slots	_____ slots	Bottom intake gap ≥15mm	[] PASS [] Check
Card Width + 12V-2x6 Bend	130–150mm card width + 35mm power cable clearance	_____ mm	_____ mm	_____ mm to side glass	[] PASS [] 90° cable
PSU Bay Length (mm)	140–150mm (compact ATX 3.1) · 160–180mm (1000W+)	_____ mm	_____ mm	+30mm modular cable bend	[] PASS [] Remove cage

- [] **Anti-Sag Bracket Included or Installed:** Mandatory for any 3-fan GPU over 285mm / 1.1 kg to prevent PCIe PCB cracking near the locking tab.
- [] **Slightly Positive Case Pressure:** Configure front/bottom filtered intake CFM slightly above rear/top exhaust CFM to feed fresh air directly under the GPU shroud.

A. Pre-Install & UEFI / BIOS Checklist

- [] **Download DDU & Latest WHQL Driver Offline:** Save Display Driver Uninstaller (DDU) and the newest NVIDIA Game Ready/Studio or AMD Adrenalin installer to your desktop before shutting down.
- [] **Safe Mode DDU Wipe (When Switching GPU Vendors/Generations):** Boot into Windows Safe Mode (offline), run "Clean and Shutdown (For installing a new graphics card)".
- [] **Enable Resizable BAR (Above 4G Decoding):** Confirm Resizable BAR / AMD Smart Access Memory is set to **Enabled** in BIOS (adds 5%–12% in modern DX12 titles).
- [] **Re-Verify EXPO / XMP Memory Profile:** Motherboard BIOS resets often drop DDR5 back to 4800 MT/s—confirm EXPO/XMP is active in Task Manager / CPU-Z.

B. Post-Boot Telemetry & Thermal Audit

- [] **GPU-Z Bus Interface Check:** Click the ? render test in GPU-Z and verify Bus Interface reads **PCIe x16 4.0 @ x16 4.0** (or **PCIe x16 5.0 @ x16 5.0**) under load.
- [] **HWInfo64 12V-2x6 / +12V Rail Voltage Check:** During a 15-minute gaming/3DMark loop, confirm GPU 16-pin HVPWR voltage stays above **11.80V** (<2% droop).
- [] **Core vs. Hotspot / VRAM Delta:** Verify GPU core stays ≤75°C and GPU Hotspot / Memory Junction stays ≤88°C under sustained 99% load.
- [] **Windows Display & VRR Check:** Set Windows Display Settings to your monitor's max native Hz, enable G-SYNC / FreeSync VRR, and enable Hardware-Accelerated GPU Scheduling.

INTERACTIVE HARDWARE TOOLS & CURRENT GPU BUYING GUIDES (CLICK TO OPEN)

1. [Interactive GPU + ATX 3.1 PSU Wattage & Clearance Calculator →](https://thehardwarepick.com/tools/gpu-psu-wattage-calculator/)
2. [2026 GPU Hierarchy Tier List \(1080p / 1440p / 4K Benchmarks\) →](https://thehardwarepick.com/best/gpu-hierarchy-tier-list-1080p-1440p-4k/)
3. [Which Graphics Card Should You Buy in 2026? \(Full Guide\) →](https://thehardwarepick.com/best/which-graphics-card-to-buy/)
4. [NVIDIA RTX 5070 vs. AMD RX 9070 Head-to-Head Comparison →](https://thehardwarepick.com/best/rtx-5070-vs-rx-9070/)