



Name of the Bundle	Advanced Bundle V1	Subject	Technical Support Fundamentals
Topic	Power Supply	Last updated on	09 August 2024

1. What is the primary function of a power supply unit (PSU) in a computer system?

- a. To store data
- b. To cool the computer components
- c. To convert AC power to DC power
- d. To enhance processing speed

Answer: c. To convert AC power to DC power

Explanation: The primary function of a PSU is to convert the alternating current (AC) from the wall outlet into direct current (DC) which is used to power the internal components of a computer, as most electronic components in a computer require DC power to operate.

2. What does SMPS stand for?

- a. Simple Mechanical Power Supply
- b. Switched-Mode Power Supply
- c. Standard Mechanical Power Supply
- d. Signal Modulated Power System

Answer: b. Switched-Mode Power Supply

Explanation: SMPS stands for Switched-Mode Power Supply, a type of power supply that uses a switching regulator to efficiently convert electrical power. It is widely used in computers and other electronic devices due to its efficiency and compact size.



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3. Which of the following is a common type of connector used by a PSU to power a motherboard?

- a. SATA
- b. Molex
- c. ATX 24-pin
- d. USB

Answer: c. ATX 24-pin

Explanation: The ATX 24-pin connector is commonly used by a PSU to power a motherboard. This connector provides the necessary power to the motherboard and its components.

4. Which of the following ratings indicates a power supply's maximum output capacity?

- a. Voltage
- b. Wattage
- c. Amperage
- d. Frequency

Answer: b. Wattage

Explanation: Wattage indicates a power supply's maximum output capacity.

It represents the total amount of power the PSU can deliver to the computer's components, such as the CPU, GPU, and storage devices.



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5. Which component inside the PSU is responsible for converting AC to DC?

- a. Transformer
- b. Capacitor
- c. Rectifier
- d. Fan

Answer: c. Rectifier

Explanation: The rectifier inside the PSU is responsible for converting AC (alternating current) to DC (direct current). This process is essential because the components inside a computer require DC power to operate.

6. Which of the following power connectors is used specifically for powering hard drives and optical drives?

- a. ATX 24-pin
- b. PCIe 6/8-pin
- c. SATA power connector
- d. EPS 8-pin

Answer: c. SATA power connector

Explanation: The SATA power connector is used specifically for powering hard drives and optical drives. It provides the necessary voltage levels for these storage devices to operate.



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7. What role does the power supply's fan play in the overall system?

- a. Increases processing speed
- b. Regulates voltage output
- c. Dissipates heat generated by the PSU
- d. Provides power to peripheral devices

Answer: c. Dissipates heat generated by the PSU

Explanation: The fan in the power supply unit (PSU) helps dissipate heat generated during the conversion of AC to DC power. Effective cooling is crucial to maintaining the longevity and reliability of the PSU and overall system stability.

8. If a PSU is labeled as "modular," what does that mean?

- a. It can be easily upgraded with additional components.
- b. Its cables can be detached and replaced as needed.
- c. It has a built-in battery backup.
- d. It only works with certain motherboards.

Answer: b. Its cables can be detached and replaced as needed.

Explanation: A modular PSU allows the user to detach and replace cables as needed. This feature helps improve cable management inside the computer case, reduces clutter, and enhances airflow, which can contribute to better cooling.



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9. What is the primary function of the transformer in an SMPS?

- a. To convert AC to DC
- b. To store energy temporarily
- c. To step up or step down the voltage
- d. To regulate output voltage

Answer: c. To step up or step down the voltage

Explanation: In an SMPS, the transformer is used to step up (increase) or step down (decrease) the voltage to the required level. The transformer operates at high frequencies, which allows the SMPS to be more efficient and compact.

10. Which component in an SMPS is responsible for controlling the switching frequency?

- a. Diode
- b. Capacitor
- c. Transistor
- d. Oscillator

Answer: d. Oscillator

Explanation: The oscillator in an SMPS controls the switching frequency. It generates a high-frequency signal that drives the transistors to switch on and off rapidly, enabling efficient power conversion.



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11. Why is a high switching frequency used in SMPS?

- a. To reduce power loss
- b. To increase power output
- c. To improve noise filtering
- d. To increase the size of the components

Answer: a. To reduce power loss

Explanation: High switching frequency is used in SMPS to reduce power loss and allow the use of smaller inductors and capacitors. This leads to higher efficiency and a more compact power supply design.

12. What is the main purpose of using capacitors in an SMPS circuit?

- a. To store data
- b. To provide thermal protection
- c. To filter and smooth the output voltage
- d. To increase voltage levels

Answer: c. To filter and smooth the output voltage

Explanation: Capacitors in an SMPS are used to filter and smooth the output voltage. After rectification and conversion, the output may contain ripples or noise, which capacitors help to reduce, ensuring a stable DC output.



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13. What is the first step you should take before opening up a computer to work on its power supply?

- a. Turn off the monitor
- b. Unplug the power cord
- c. Wear rubber gloves
- d. Ground yourself with a wrist strap

Answer: b. Unplug the power cord

Explanation: The first and most critical step before working on a computer's power supply is to unplug the power cord from the wall outlet. This ensures that no electrical current is flowing into the system, reducing the risk of electric shock.

14. Why is it important to avoid touching the capacitors inside a power supply unit (PSU)?

- a. They can emit radiation
- b. They store electrical charge even after power is disconnected
- c. They are very fragile and can break easily
- d. They contain toxic chemicals

Answer: b. They store electrical charge even after power is disconnected

Explanation: Capacitors inside a PSU can store electrical charge for a significant amount of time even after the power has been turned off and the unit unplugged. Touching them can result in a dangerous electric shock.



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15. Which of the following is a potential sign that a PSU is failing and could pose a safety risk?

- a. The computer boots up faster than usual
- b. A burning smell or unusual noise
- c. The monitor flickers occasionally
- d. The computer's fan runs quietly

Answer: b. A burning smell or unusual noise

Explanation: A burning smell, unusual noises like buzzing or clicking, or visible smoke can be signs of a failing PSU. These issues should be addressed immediately by shutting down the computer and unplugging it, as a failing PSU could pose a fire hazard.

16. Which of the following is a safety precaution when handling a power supply unit (PSU)?

- a. Only work on the PSU in a well-ventilated area
- b. Always discharge the capacitors before touching any internal components
- c. Use a magnetized screwdriver to prevent losing screws
- d. Handle the PSU while it is plugged in to test for faults

Answer: b. Always discharge the capacitors before touching any internal components

Explanation: Discharging the capacitors before touching any internal components is a crucial safety step. This can be done by either waiting for the charge to dissipate over time or using a resistor to safely discharge the capacitor. This prevents the risk of electric shock.



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17. What should you avoid doing with a power supply unit (PSU) while it is plugged in?

- a. Opening the PSU casing
- b. Using it in a dusty environment
- c. Placing it on a metal surface
- d. Positioning it near other electronic devices

Answer: a. Opening the PSU casing

Explanation: You should never open the PSU casing while it is plugged in, as it contains high-voltage components that can cause serious injury or death. Even when unplugged, caution is necessary due to the residual charge stored in capacitors.

18.. Why is it recommended to use a power supply with overcurrent protection (OCP) and over-voltage protection (OVP)?

- a. To improve the computer's processing speed
- b. To reduce the electricity bill
- c. To protect the computer components from electrical damage
- d. To make the computer run quieter

Answer: c. To protect the computer components from electrical damage

Explanation: Over-current protection (OCP) and over-voltage protection (OVP) are safety features in a PSU that prevent damage to the computer components from unexpected power surges or excessive current. These features can help prevent hardware failures and potential fire hazards.



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19. What is the recommended way to dispose of a faulty or old power supply unit (PSU)?

- a. Throw it in the regular trash
- b. Burn it to prevent reuse
- c. Recycle it at an e-waste facility
- d. Donate it to a friend

Answer: c. Recycle it at an e-waste facility

Explanation: Faulty or old PSUs should be recycled at an e-waste facility, where they can be safely dismantled and the materials can be reused or properly disposed of. This helps prevent environmental contamination and allows for the responsible handling of electronic waste.

20. Why should you avoid using a PSU that has visible physical damage?

- a. It might void the computer's warranty
- b. It could cause poor system performance
- c. It could pose a serious electrical hazard
- d. It may not look aesthetically pleasing

Answer: c. It could pose a serious electrical hazard

Explanation: Using a PSU with visible physical damage can be extremely dangerous, as it could lead to electrical shorts, fires, or electric shocks.

Damaged PSUs should be replaced immediately to ensure the safety of the user and the system.



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21. What should you do if you suspect your PSU is causing system instability or random shutdowns?

- a. Replace the power cord
- b. Install additional cooling fans
- c. Test the PSU with a multimeter or PSU tester
- d. Overclock the CPU to compensate

Answer: c. Test the PSU with a multimeter or PSU tester

Explanation: If you suspect that the PSU is causing system instability or random shutdowns, it's important to test it with a multimeter or a dedicated PSU tester. This will help determine if the PSU is supplying stable and correct voltages. If it fails the test, the PSU should be replaced.

22. What is the danger of using an underpowered PSU for your computer components?

- a. The computer will run more efficiently
- b. It will enhance the performance of your GPU
- c. It could lead to hardware damage or system failure
- d. It will reduce the noise levels

Answer: c. It could lead to hardware damage or system failure

Explanation: Using an underpowered PSU can result in insufficient power delivery to the computer's components, leading to hardware damage, system crashes, and potential data loss. It's important to ensure that the PSU has adequate wattage to support all connected components.



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23. Which feature of a power supply unit (PSU) helps protect against damage from power surges?

- a. Overclocking
- b. Over-voltage protection (OVP)
- c. Modular cabling
- d. High wattage rating

Answer: b. Over-voltage protection (OVP)

Explanation: Over-voltage protection (OVP) is a feature in many PSUs that automatically shuts down the unit if the voltage exceeds a certain threshold, protecting the connected components from damage caused by power surges.

24. Why is it important to use a surge protector with your computer's PSU?

- a. To improve processing speed
- b. To prevent electrical damage from power spikes
- c. To make the computer quieter
- d. To reduce electricity consumption

Answer: b. To prevent electrical damage from power spikes

Explanation: Using a surge protector with your computer's PSU helps protect it from power spikes, which can cause significant damage to the PSU and other computer components. Surge protectors absorb and dissipate excess voltage, safeguarding your system.



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25. Which of the following is a key tip to ensure the longevity of your PSU?

- a. Keep the PSU at maximum load continuously
- b. Regularly clean dust out of the PSU vents
- c. Use the PSU without any cooling fans
- d. Place the PSU in direct sunlight

Answer: b. Regularly clean dust out of the PSU vents

Explanation: Dust can accumulate in the PSU vents, leading to overheating and reduced efficiency. Regularly cleaning out dust helps maintain proper airflow, ensuring the PSU stays cool and operates effectively, thereby prolonging its lifespan.

26. What should you do if your PSU fan stops working?

- a. Continue using it until it fails completely
- b. Manually spin the fan to get it started
- c. Replace or repair the PSU immediately
- d. Ignore it if the PSU is still powering the computer

Answer: c. Replace or repair the PSU immediately

Explanation: If the PSU fan stops working, it can lead to overheating, which may cause the PSU to fail or even damage other components in the system. It's important to replace or repair the PSU immediately to avoid potential damage.



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27. Which PSU feature helps protect against short circuits?

- a. Low noise operation
- b. Over-current protection (OCP)
- c. Active cooling system
- d. Modular design

Answer: b. Over-current protection (OCP)

Explanation: Over-current protection (OCP) is a safety feature that protects the PSU and other components from damage by shutting down the power supply if the current exceeds safe levels, such as during a short circuit.

28. Why is it important to use a PSU with adequate wattage for your system?

- a. It makes the computer run faster
- b. It ensures that all components receive enough power
- c. It reduces the noise level
- d. It allows for more USB ports to be used

Answer: b. It ensures that all components receive enough power

Explanation: Using a PSU with adequate wattage is crucial because it ensures that all components in your system receive the power they need to function properly. If the PSU is underpowered, it can lead to system instability, crashes, and even hardware damage.



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29. What is the purpose of using an uninterruptible power supply (UPS) with your computer?

- a. To enhance internet speed
- b. To prevent data loss during power outages
- c. To reduce system noise
- d. To allow overclocking of the CPU

Answer: b. To prevent data loss during power outages

Explanation: An uninterruptible power supply (UPS) provides temporary power to your computer during a power outage, allowing you to save your work and shut down the system safely. This helps prevent data loss and potential damage to your hardware.

30. What could happen if a PSU is operated at temperatures above its rated limit?

- a. Increased efficiency
- b. Enhanced performance
- c. Overheating and potential failure
- d. Improved cooling

Answer: c. Overheating and potential failure

Explanation: Operating a PSU at temperatures above its rated limit can lead to overheating, which may cause the PSU to fail or reduce its lifespan. It's important to ensure proper ventilation and cooling to keep the PSU within safe temperature ranges.



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31. Why is it recommended to buy a PSU from a reputable manufacturer?

- a. For better aesthetics
- b. To ensure a longer warranty period
- c. To guarantee reliability and safety features
- d. To increase the computer's speed

Answer: c. To guarantee reliability and safety features

Explanation: Reputable manufacturers are more likely to provide PSUs that meet industry standards for safety and reliability. These PSUs typically include important protection features like OVP, OCP, and short circuit protection, ensuring the safety and longevity of your computer component.

32. What tool is commonly used to test the output voltage of an SMPS?

- a. Oscilloscope
- b. Multimeter
- c. Soldering iron
- d. Power drill

Answer: b. Multimeter

Explanation: A multimeter is the most commonly used tool for testing the output voltage of an SMPS. It allows you to measure the voltage, current, and resistance, ensuring that the SMPS is delivering the correct voltages to the computer components.



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33. Before testing an SMPS, what is the first safety precaution you should take?

- a. Wear safety glasses
- b. Disconnect the power cord
- c. Discharge the capacitors
- d. Use an anti-static wrist strap

Answer: b. Disconnect the power cord

Explanation: The first safety precaution before testing an SMPS is to disconnect the power cord. This ensures there is no live current running through the unit, reducing the risk of electric shock.

34. When testing an SMPS without connecting it to a motherboard (bench testing), what is required to turn it on?

- a. Short the PS_ON pin to ground
- b. Connect a load to the 12V rail
- c. Plug it into a working outlet
- d. Turn the power switch on

Answer: a. Short the PS_ON pin to ground

Explanation: To turn on an SMPS during bench testing (without a motherboard), you need to short the PS_ON pin (usually green) to a ground pin (usually black) on the 24-pin ATX connector. This simulates the motherboard's power-on signal, allowing the SMPS to start.



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35. Which of the following is an important safety step after testing an SMPS?

- a. Reinstall the SMPS without discharging capacitors
- b. Clean the SMPS with water
- c. Discharge the capacitors before handling the unit
- d. Immediately plug the SMPS back into the computer

Answer: c. Discharge the capacitors before handling the unit

Explanation: After testing an SMPS, it's important to discharge the capacitors before handling the unit further. Capacitors can retain a charge even after the unit is powered off, posing a risk of electric shock.

36. What is a sign that an SMPS may be supplying incorrect voltages?

- a. The computer boots up faster than usual
- b. The system is stable under heavy load
- c. Random reboots or system crashes
- d. The fan operates at a higher speed

Answer: c. Random reboots or system crashes

Explanation: Random reboots, system crashes, or instability under load can be signs that an SMPS is supplying incorrect or unstable voltages. Testing the SMPS with a multimeter or load tester can help diagnose these issues.



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37. Which of the following voltage levels are commonly provided by the output pins of a standard ATX computer SMPS?

- a. +5V, -5V, +12V, -12V, +3.3V
- b. +7V, -7V, +12V, -12V, +3.3V
- c. +5V, -5V, +9V, -9V, +3.3V
- d. +5V, +12V, +9V, -9V, +3.3V

Answer: A. +5V, -5V, +12V, -12V, +3.3V

Explanation: A typical ATX computer SMPS provides several standard voltage levels: +5V, -5V, +12V, -12V, and +3.3V. These voltages are necessary for powering various components inside the computer, such as the motherboard, hard drives, and other peripherals.

38. What is the function of the 24-pin connector in a computer SMPS?

- a. To provide power to the CPU only
- b. To supply power to the motherboard and peripherals
- c. To connect the SMPS to external devices
- d. To regulate the voltage output of the SMPS

Answer: B. To supply power to the motherboard and peripherals

Explanation: The 24-pin connector is the main power connector used by ATX motherboards. It supplies power to the motherboard and its components, including the CPU, RAM, and peripheral slots. This connector includes various voltage outputs, including +3.3V, +5V, and +12V, which are distributed to different parts of the motherboard.



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39. What is the purpose of the +12V rail in a computer SMPS?

- a. To power low-voltage components like RAM and CPU
- b. To power the cooling fans and storage devices
- c. To power high-current components like the CPU and GPU
- d. To regulate the +5V rail

Answer: c. To power high-current components like the CPU and GPU

Explanation: The +12V rail in a computer SMPS is responsible for supplying power to high-current components, such as the CPU and GPU, which require significant power to operate. It also powers other devices like hard drives and fans, but its primary role is supporting high-power components.