



Disassembly and Analysis of Switching Power Supplies

Acknowledgements: Developed by Palmerino Mazzucco and Roger Harlow, members of electronics faculty of Mesa Community College, Mesa Arizona

Special Note: Complete this activity before the Drill Down Activity: Internet Research on Switching Power Supplies. You will use what you learn in this activity to complete the next Drill Down.

Time Required: 1-2 Hours

Equipment and Tools

- One switching power supply per team, salvaged from standard microcomputer (Note: Look for outdated models that are easy to acquire and cost very little. If possible each team should have a different model.)
- Screwdrivers: Phillips or flathead depending on individual chassis
- Wire cutters and needle-nose pliers may be needed

Team Activity: This is a team activity. Each team should consist of two to four students.

Learning Objectives

- Acquire general knowledge of the configuration and application of a common switching power supply—knowledge will vary with chosen power supply.
- Identify the type and configuration of the chosen power supply, and match it with an appropriate type that is described in the module content.
- Produce a report of power supply findings that includes electrical/electronic specifications, named components, vendor information, and suggested common problems that may occur in the supply's functions. Base these suggestions on fundamental electrical/electronic theory and/or knowledge of device functions.

Performance and Task Procedures

1. Delegate tasks in your team so that each member is allowed to work on the task and has equal participation in discussions and input into the final report.
2. Physically inspect the power supply. Record data such as distinctive markings on the supply that identify the system and characteristics of the power supply model, current capacity, output voltage levels, date of manufacture, and switching supply type.



3. Disassemble the power supply and make a list of as many recognizable switching power supply components as possible. Resistors and common capacitors need not be included in this list. Look for unique semiconductor devices, fuses, transformers, coils, integrated circuits, and other distinguishing components and features.
4. Examine and describe (in notes for the final report) the chassis used to store the power supply, the design of heat sinks, and any other structures that perform a function such as heat transfer and the shielding of circuits.

For example, discuss among your team and document the purpose of any slots or vents used in the design of the chassis and heat sink. Is the switching supply cooled by one or more fans? Do you observe a bridge rectifier in the circuit? What is its purpose?

Do you notice any fuses and transformers inside the power supply? What are the ratings of the fuses used in this application, and how might the ratings be determined? Document the findings.

5. Observe and locate the input power terminals to the switching supply. Document the type of AC or DC input power needs used to operate this switching supply. Do the specifications marked, if any, indicate what the minimum input levels would be for this supply to continue providing a DC output?
6. Observe and document the number of outputs coming from this supply via the external cabling. Document any ideas you have about why so many output wires are required from the switching supply and why so few input wires are required.

Deliverables: Final Report

The deliverables include a written report or an oral presentation that includes the following:

- Organized and complete power supply specifications. In some cases, the vendor data may have been removed. If so, find all other references to specifications that can be found on components, and assemble an organized list.
- A list of all identified components that make up the switching power supply. Describe their function as well as possible. Include model numbers for integrated circuits and diodes whenever possible. Provide transformer data if applicable.
- A summary of what was learned about the power supply, its specific function, its application (type of computer), and explain how (if possible) the



particular power supply was matched to this system. At the end of the report, include a list of any questions about the power supply, its application, or its function that were not answered.

- Present the report orally to your class as directed by your instructor. This report should be formal and presented as if the team were presenting to a company, group of engineers, or any other business-related activity. Present the unanswered questions to the class as a challenge to see if peers can help answer them.

Scoring or Grading Criteria

It is the instructor's decision whether to grade this activity or not.

Reports should exhibit the following characteristics:

- Concise, to the point, and easily understood by other students
- Well written and presented with proper sentence structure and no grammar errors