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Miniature Laptop Power Supply: Shrinking the Power Supply Size Requirement for a Conventional Laptop

Over the past decade, the power requirement for laptops has grown substantially. As a result, the physical size of laptop power supplies has also increased. A fundamentally different design is needed to shrink the laptop power supply. I have researched various approaches to solve this problem and have come up with several ideas, some of which I have implemented in a prototype. The most substantial improvement that I have made is to replace the power supply's bulky transformer with small capacitors. Additionally, I have centered my design around a resonant circuit topology so that it can operate efficiently at a higher switching frequency. This allows physically smaller capacitors and inductors to be used. We feel that this power supply size could be further shrunk by using a custom enclosure that would replace the circuit's heat sinks and by designing a single integrated circuit component that would contain most of the circuit's parts. Ultimately, we think that the power supply size could be shrunk to 2in x 1.5in x 1in and weigh 5.5oz for a standard 70W laptop.



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