



## **Low-Load Efficient Wall-Mount Adapter**

CogniPower has developed, and is patenting, a new form of the ordinary wall-mount power adapter. Billions of these power supplies are sold every year.

The conventional wall-mount adapter uses too much electricity when lightly loaded. While running at idle, CogniPower wall adapters use less power than the best conventional adapters. They run high efficiencies, even at very low loads. Our adapters also control the output voltage more precisely than conventional adapters.

Our wall adapters are smaller than others because they can be built without needing the bulky electrolytic capacitors normally used. Not only are electrolytic capacitors physically large, but also they are the main cause of failures in ordinary wall adapters. Tantalum capacitors are smaller and more reliable, but at a cost penalty. The CogniPower design, through better regulation, allows the use of ceramic filter capacitors, which are small, reliable and inexpensive.

Optocouplers often used for feedback. They are slow, highly variable, and are potential points of failure. Indirect feedback from a separate transformer winding is another means of regulation, but controlling a related auxiliary voltage is not the same as regulating the actual output.

In the CogniPower design, a patent-pending technique is used to obtain agile, timely feedback information from the main output, eliminating the optocoupler and allowing the use of a much smaller filter capacitor through better regulation. By replacing the large filter capacitor with a little extra silicon intelligence, the total cost of a power adapter can shrink along with the physical size.

These supplies regulate smoothly all the way down to no load. At 10% load, efficiencies of over 80% can be maintained from low line at 115VAC to high line at 230VAC.

Related techniques can bring similar benefits to "brick" power supplies for laptops and larger power supplies for desktop computers and file servers. Also, a variation on this technology is well-suited for increasing reliability and reducing the cost of LED light bulbs.

A fundamental patent is in process covering means for operating the main switching element from the isolated side, by using the power transformer as a digital isolator.