

Re: Electronic dimmer as Variac

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DaveC wrote:

>

> *I want to turn up a switching power supply slowly after repairing it, so as
> to see if anything else is damaged. I have no Variac, and I could use the
> series light bulb trick, but I already have a light dimmer I'm using as a
> variable-temperature control for my soldering iron that could do double-duty
> in this application.*

>

> *I know that the SMPS, when running correctly, will be a load pulse at 75 kHz.
> Has anyone tried using a dimmer as an "electronic variac"? Is it feasible?*

It is very doubtful. A dimmer needs a minimum current load to keep it conducting the remainder of each half cycle after it is fired.

Resistive loads are ideal, and average the resultant waveform quite well. SMPS usually rectify the line waveform and apply that directly to an energy storage capacitor that charges up to the peak waveform voltage each half cycle (and does that during a small part of the cycle, near the peak).

When your dimmer fires, the rectifier and cap will look like a near short circuit to a voltage that is something less than the line voltage at that instant (whatever voltage remains on the cap from the previous half cycle). And the moment the line voltage starts to go down, the rectifier will turn off, isolating the cap from the dimmer, causing the dimmer current to fall below its holding current, so it will turn off. In other words, you will probably not get the smooth control you are needing (any setting that includes the peak of each half cycle will produce the same result) and may damage the dimmer and/or the rectifier and/or the capacitor with the big pulses of current that occur as the dimmer switches on.

Sometimes you need the right tool.

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John Popelish