

## Re: Using a uC for DC-DC conversion?

**Source:** <http://sci.tech-archive.net/Archive/sci.electronics.design/2004-10/3720.html>

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**Date:** 10/13/04

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Hi Ken,

>Some of Linear's chips use "burst mode". I've seen switchers that used  
>"hit and miss" regulation where the transistor either turned on for a  
>fixed time or didn't. This is basically a granularity of 1 bit.

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>In both cases, the output capacitor must be larger to reduce the ripple.

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Yes, that's what I meant with idling like a rough engine. In engines they just use a larger flywheel which is their "capacitor". In race cars they reduce that again which is why their engines quit if you don't play with the accelerator all the time.

The best kind of "regulator" was the one on old European WW I planes: The cylinders were rotating around a fixed shaft so the only way to throttle power was to connect or disconnect ignition to some cylinders. It was best not to land these in dry grass.

>Don't some low cost micros have comparitors? You don't really need  
>anything like a good adc. You only really care right near the regulation  
>point. Chances are a "too high" / "too low" signal would be enough to  
>make a regulator that worked.

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>

They often only have one comparator and not much in terms of a mux in front. So if you need adjustable voltage and current you run into a bind. Throw in a third parameter as is often the case in applications with a micro and you are in a real pickle.

>>making the code that runs the PWM safe and fast enough. After all, one  
>>minor hangup in this area could result in a plume of smoke.

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>Design carefully. If you leave the ground pin of a switcher chip  
>disconnected you get the same result.

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LOL! That is a good one.

>>*Next, there*

>>*is the trend to ever lower VCC levels which renders the task of turning*

>>*on a FET hard enough non-trivial.*

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>>

>

>*Use a PIC they still run at 5V. If you have to make a level shifter, you*

>*may as well use a switcher chip in place of it.*

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>

Most apps also require micro power, IOW next to nothing in current when in standby. No power switch. Some of the 80C51 families can do that but the MSP currently leads the pack here. They do make a few 5V versions but these are not mainstream and there is always the worry about whether a chip will be available for 10 years or more.

Regards, Joerg

<http://www.analogconsultants.com>