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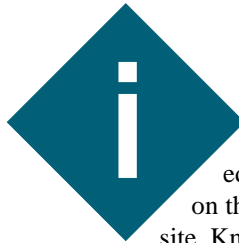
THE MAGAZINE FOR COMPUTER APPLICATIONS

FEATURE ARTICLE

Lawrence Foltzer

A Switcher for Many Reasons

Need a quick solution for a variable high-voltage application? Lawrence shows us that the answer may be as simple as making a variable burst length, fixed duty-cycle, switching power supply driven by an RC-clocked PIC microcontroller.



recently responded to a call for help on the Microchip web site, Knowledge Base,

PICmicro Conference. The gentleman was looking for a device that could provide a programmable/variable (30–150 V) DC supply voltage to actuate a piezoelectric mechanism. His idea was straightforward enough—have a PIC drive a DAC followed by an amplifier.

Previously, I developed a simpler approach to his problem, but for another variable high-voltage application. My technique operates off the same 3–6-V supply the processor uses, doesn't require the DAC, and can all be done with a simple PIC12C508.

My approach (shown in Figure 1) was basically a variable burst-length, fixed duty-cycle switching power supply driven by an RC-clocked PIC micro-

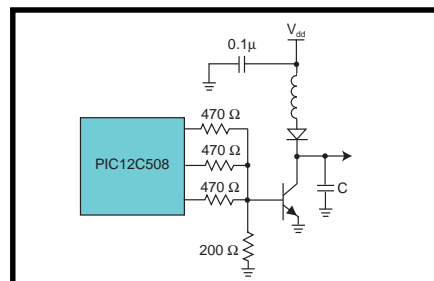


Figure 2—The design details of the switcher are all here.

controller.

As Figure 2 shows, you won't need much power to drive a piezo transducer, a photomultiplier or avalanche photodiode, or a high peak current avalanche pulse generator, so you might try this approach if your system is short on power.

The transistor is a 2N6515 and you'll need a fast high-voltage diode like the MURS160 for the rectifier. Drive impedance needs to be low even though only low drive power is required, given the low switch current. The low-impedance drive suppresses feedback from output to input which otherwise would cause erratic operation of the switcher. You might try driving the switching transistor with a common emitter buffer amplifier and save I/O ports on the processor.

SOURCE

PIC12C508

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SOFTWARE

The code used in this project is available via the [Circuit Cellar web site](http://www.circuitcellar.com).

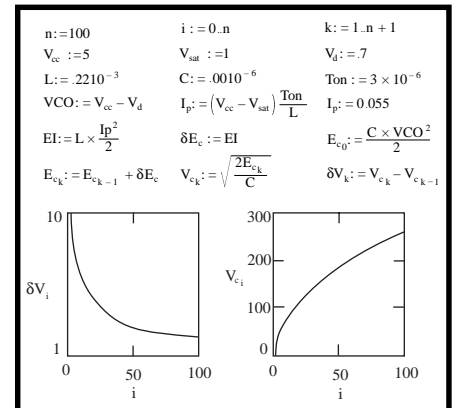


Figure 1—Here's a look at the basic circuit topology for my solution.

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