

## **Abstract**

### **An Integrated Digital Controller for DC–DC Switching Converter with Dual–Band Switching**

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A 0.6 $\mu$ m CMOS integrated digital PID controller for a buck converter is presented. It consists of: (1) a VCO driving a counter to serve as an ADC; (2) a PID compensator that Employs variable integration times for enhancing accuracy and stability, and (3) a dual-band switching PWM generator with a modified tapped delay line for better output resolution and area efficiency. The converter switches at 1 MHz, while the tracking time is 50 $\mu$ s for a step change of 1V.