A Counter-Controlled DPWM Voltage-Mode Buck Converter with VCO

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The proposed DCPWM buck converter uses the voltage of a lithium ion battery used in portable devices, 1.1V to 1.3V, as an input voltage. It also produces 0.3V to 0.6V output voltage, and the expected output voltage ripple is less than 24mV. The load current range is 50mA to 200mA, and 2.2μH inductor and 10μF capacitor are used as external devices. The chip was manufactured using a 0.065μm CMOS 6-metal 1-poly process.
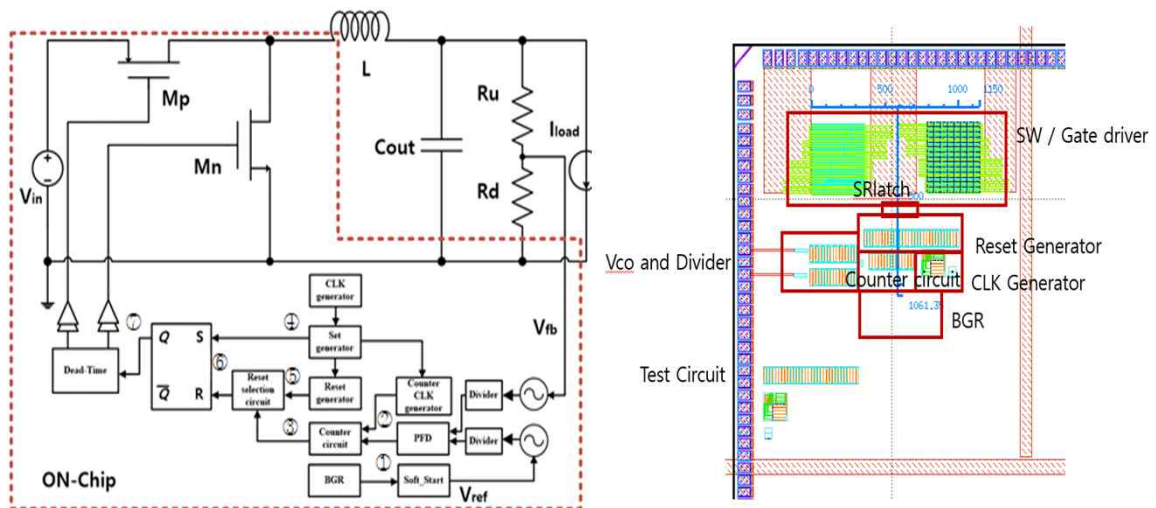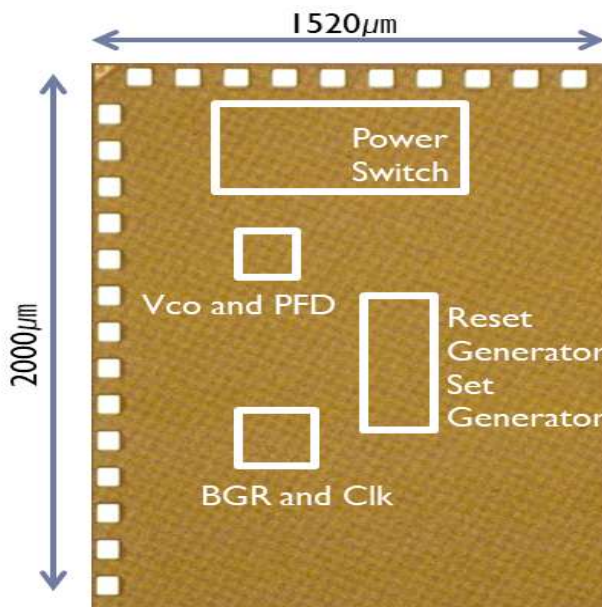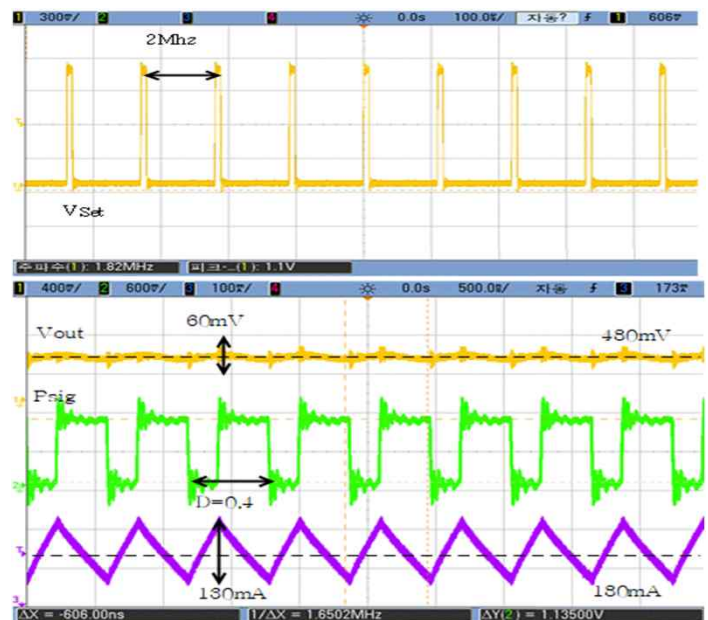
Fig 1.Top Cell

Fig 2. Chip photo

Fig 3. Vout to Inductor I

The proposed DCPWM buck converter provides simulation results of input voltages from 1.1V to 1.3V and load currents from 50mA to 180mA. The switching frequency is 1.5 MHz to 2 MHz. By increasing the internal CLK frequency and increasing the number of reset signals, you can create DCPWM buck converters with various duty ratios.