

# NXP achieves ultra-low output voltage ripple with 6-MHz DC/DC converter

October 12 2012

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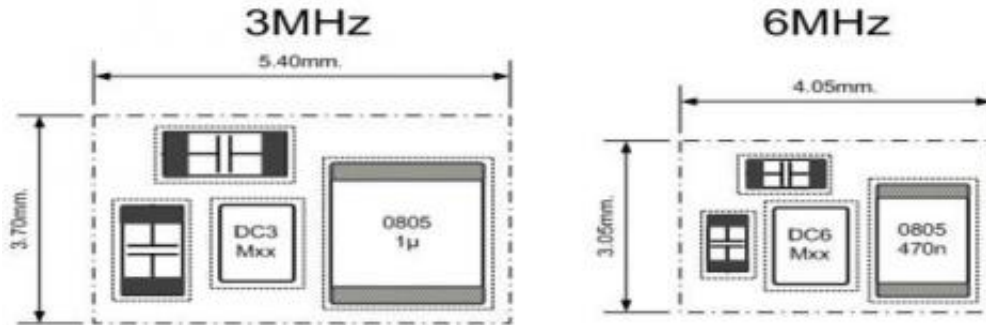


NXP Semiconductors today announced its state-of-the-art DC6M DC/DC switching regulator family featuring a very high 6-MHz frequency, an ultra-low output voltage ripple performance of 7 mV, and high efficiency up to 95 percent. The DC6M family supports up to 650 mA supply current in a very small wafer-level chip-scale package

(WLCSP6), measuring only 1.36 x 0.96 x 0.47 mm. With an input voltage range from 2.3 to 5.5 V, the new DC/DC converters are ideally suited for battery-driven portable devices such as smartphones, as well as other consumer devices where reliable, efficient power management is essential and space is limited.

With a typical output [voltage](#) ripple of only 7 mV, the DC6M family (including the DC6M4, DC6M5 and DC6M6) minimizes disturbances to the [output voltage](#) signal caused by the switching mechanism, thus enabling a stable signal, enhancing energy efficiency, and overcoming a common limitation of most other DC/DC converters today. In addition, the high switching frequency of 6 MHz allows the usage of SMD inductors as small as 470 nH in a flat 0805 package size (available with heights as small as 0.8 mm), further reducing the space required in the design. To illustrate, a typical smartphone application area occupied by a step-down converter and its surrounding components can be reduced by 40 percent when using a 6-MHz DC/DC converter, instead of a 3-MHz alternative. Further, the DC6M buck converter supports the ability to disable the device, which reduces the quiescent current down to 0.2  $\mu$ A.

"DC/DC switching regulators offer built-in efficiency advantages over other voltage regulators. Providing best-in-class performance in a very flat package, our DC6M step-down regulators open exciting new possibilities for engineers in designing sub-systems with higher efficiency, cleaner signals and much smaller footprint – whether they use the DC6M as a standalone or in combination with LDOs," said Frank Hildebrandt, international product marketing manager, standard linear product line, [NXP Semiconductors](#).



The DC6M DC/DC switching regulators are the latest additions to NXP's high-quality DC power management products, including DC/DC converters, low-dropout (LDO) voltage regulators, and voltage references.

## Key Features

The NXP DC6M4, DC6M5 and DC6M6 DC/DC step-down switching regulators provide the following features:

- High 6 MHz switching frequency, which allows the usage of very small inductors (470 nH)
- Availability in output currents of 425, 500 and 650 mA
- Output signal with very low disturbances; output ripple typically at 7 mV
- Very [high efficiency](#) of up to 95%; optimized for loads from 40 to 650 mA
- Ability to disable the device, which reduces the quiescent current down to 0.2  $\mu$ A
- Input voltage range from 2.3 to 5.5 V, and an output voltage

range from 1.2 to 2.85 V, supporting requirements of battery-driven portable devices

- Very small WLCSP6 package (1.36 x 0.96 x 0.47 mm)
- High power dissipation of 800 mW
- Many additional options, including voltage switch; a forced PWM mode for Pulse Width Modulation (instead of automatic Pulse Frequency Modulation/PWM switch); or the SMIA standard (XSHUTDOWN/powergood) option

## Availability

Qualification samples of the DC6M6 series (supporting 650 mA) are available immediately. Indicative pricing for 1,000 pieces is \$0.65 USD.

**More information:** Leaflet on the NXP DC6M4/5/6 6-MHz DC/DC step-down converter: [www.nxp.com/documents/leaflet/75017340.pdf](http://www.nxp.com/documents/leaflet/75017340.pdf)

Product information on the DC6M6 series:

[www.nxp.com/products/power\\_man ... C6M60XX6 FAMILY.html](http://www.nxp.com/products/power_man...C6M60XX6_FAMILY.html)

NXP's standard linear portfolio: [www.nxp.com/standard-linear](http://www.nxp.com/standard-linear)

Provided by NXP

Citation: NXP achieves ultra-low output voltage ripple with 6-MHz DC/DC converter (2012, October 12) retrieved 26 April 2024 from <https://phys.org/news/2012-10-nxp-ultra-low-output-voltage-ripple.html>

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