# World's Smallest 300mA Buck-Boost Regulator from Semtech Enables Smaller, Easier to Design Power Management Solutions

Semtech Corp announced the newest devices in its popular charge pump platform. The new 3.3V, SC630A and 5V, SC632A are the world’s smallest 300mA and 275mA (respectively) buck-boost regulators in a tiny, 2 x 2 x 0.6mm package and are designed to be used with ultra-small, 2.2µF capacitors, making them far smaller and easier to use than conventional, inductor-based buck-boost regulators. This combination of tiny package and capacitor sizes results in an overall design footprint as small as 10mm2.

The SC630A and SC632A are three-mode charge pumps (1x, 1.5x, 2x) with continuous output currents of 300mA (SC630A) and 275mA (SC632A). They are designed using Semtech’s patented, low-noise charge pump technology to provide low EMI solutions compared to inductive boost regulators and are optimized for use in a wide range of applications, including tablets, modems, set top boxes, smart phones, digital cameras, portable media players, multi-LED backlit LCDs, USB On-the-Go, and compact flash/CF+ products.

Buck-boost charge pump regulators increase or decrease voltages incoming from the main power source (input voltage) to meet the output voltage needed by the system components. The SC630A and SC632A are 3.3V and 5V buck-boost charge pump regulators that operate as LDO linear regulators when the input is greater than the 3.3V or 5V respective output voltages. When the input is less than the required output voltages, the devices automatically activate the charge pump to provide voltage boost and the headroom needed for voltage regulation.

Both new charge pumps offer a shutdown current of 0.1µA (typical) and full protection features, including internal soft-start to minimize inrush current, as well as over-current, short-circuit, and over-temperature protection.

The SC630A and SC632A are enhancements to Semtech's already popular SC630 and SC632 buck-boost charge pump regulators. These "A" version parts offer the same great performance as the "non-A" versions, but in a much smaller footprint and with a lower BOM cost. These benefits are achieved via a significant reduction in input and output capacitor size from 22µF down to just 2.2µF, by increasing the charge pump frequency to 1MHz and enhancing the dynamic performance of the regulation loop. This reduces the overall design footprint to as small as 10mm2. Both devices come in a low-profile, thermally enhanced 2 x 2 x 0.6mm MLPQ 8-pin package.

**Key Features of SC630A and SC632A**
• VIN: 2.95V to 5.5V
• VOUT: SC630A = 3.3V ±3%; SC632A = 5V ±3%
• Continuous output current: SC630A = 300mA; SC632A = 275mA
• Use small, 2.2µF capacitors
• Ultra-small footprint:
10mm2 (0402, 1.0mm x 0.5mm caps)
15mm2 (0603, 1.6mm x 0.8mm caps)
• 1MHz fixed frequency
• Source large current amounts: up to 300mA

**Applications**
Cable Modem: Companion Function Chip
Cell Phone/Smart Phone: Audio, Bluetooth, Digital Control, External Memory, Keyboard/Keypad Backlight, LCD Bias, Memory, Mic Amplifier, Microphone Controller, Mixed Signal, Pointing Device, Speaker Driver, USB (OTG), WiFi 802.11x
Digital Camera: External Memory, Image DSP, Image Sensor CCD/CMOS, Keyboard/Keypad Backlight, Memory, Motor Control, System Controller and MCE, Support Function IC, USB, Video Interface
DSL Modem: USB, WI-FI 802.11X
MP3 Player: External Memory Interface, Jack (SPKR), Memory, Support Function IC, Touchpad/User Input Device, USB
Set Top Box: HDMI/DVI, Tuner

**Pricing and Availability**
The SC630A and SC632A are available immediately in production quantities and are priced at $0.45 each in 3,000-piece lots. The ordering codes are SC630AULTRT and SC632AULTRT. Evaluation boards (SC630AEVB, SC632AEVB) are also available. Semtech offers comprehensive design assistance, including field- and factory-based support. Data sheets, volume pricing, and delivery quotes, as well as evaluation kits and samples, are available at http://www.semtech.com/info [1].

**About Semtech**
Semtech Corporation is a leading supplier of analog and mixed-signal semiconductors for high-end consumer, computing, communications and industrial

equipment. Products are designed to benefit the engineering community as well as the global community. The company is dedicated to reducing the impact it, and its products, have on the environment. Internal green programs seek to reduce waste through material and manufacturing control, use of green technology and designing for resource reduction. Publicly traded since 1967, Semtech is listed on the NASDAQ Global Select Market under the symbol SMTC. For more information, visit http://www.semtech.com [2].

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**Links:**
[1] http://www.semtech.com/info
[2] http://www.semtech.com