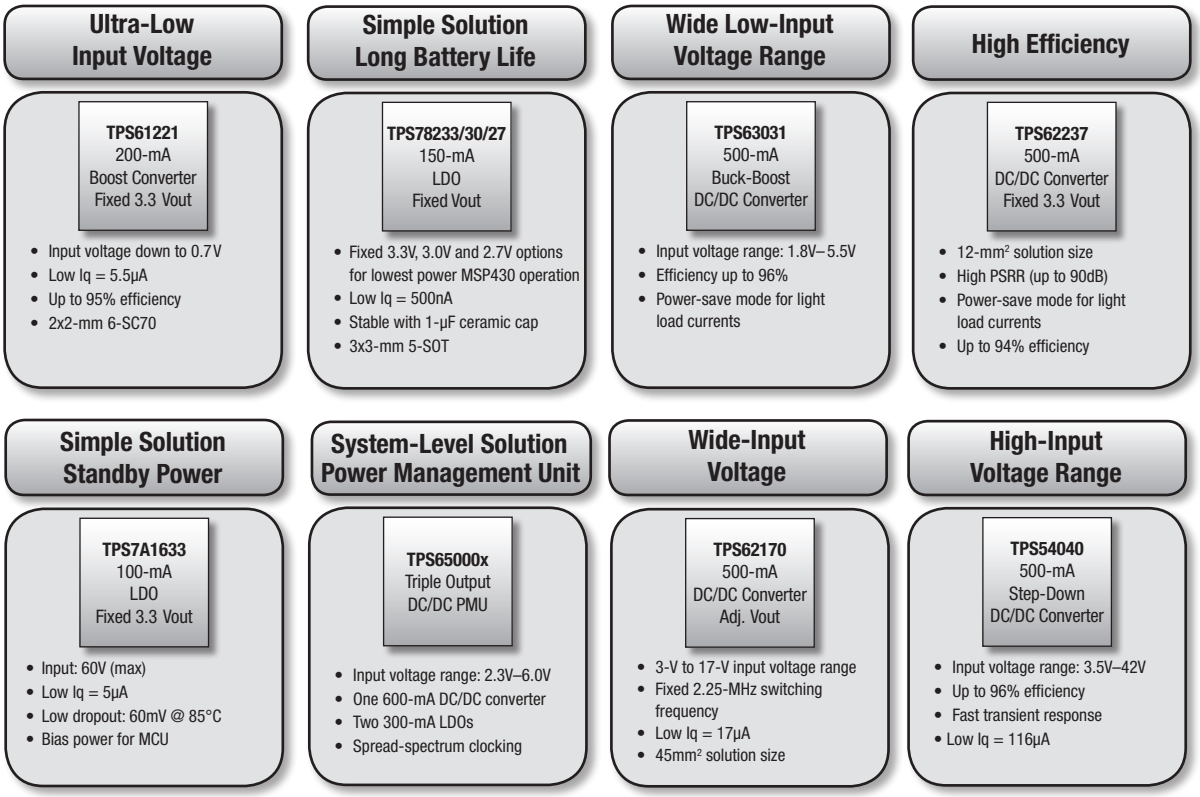
# Power Management Solutions for Ultra-Low-Power 16-Bit MSP430™ MCUs

2012

TI's MSP430 family of ultra-low-power MCUs consists of several devices featuring different sets of peripherals targeted for various applications. The architecture, combined with several low-power modes is optimized to achieve extended battery life in portable measurement applications. Depending on system constraints such as lowest possible standby current, cost sensitivity or need for smallest solution size, TI offers optimized products to power MSP430 MCU-based systems.

### Power Management Solutions Based on Typical System Requirements




| Device | Vin (V) | Iout (mA) | Description | Package |
|---|---|---|---|---|
| TPS61221 | 0.7 – 5.5 | 200 | 5.5-µA quiescent current, 95% efficiency, boost converter | 6-SC70 |
| TPS78233 | 2.2 – 5.5 | 150 | 500-nA quiescent current LDO | SOT23-5, SON-6 |
| TPS63031 | 1.8 – 5.5 | 500 | Up to 96% efficiency, buck-boost converter | 3x3 SON-10 |
| TPS62237 | 2.05 – 6.0 | 500 | Up to 94% efficiency, 3-MHz step-down converter | 1x1.5x0.6 SON-6 |
| TPS7A1633 | 3.0 – 60 | 100 | Low quiescent current LDO for MCU standby | 3x5 MSOP |
| TPS65000x | 2.3 – 6.0 | 600/300/300 | Triple output PMU, 2.25-MHz converter with dual LDOs | 3x3 QFN |
| TPS62170 | 3.0 – 17 | 500 | Up to 95% efficiency, 2.25-MHz step-down converter | 2x2 WSON |
| TPS54040 | 3.5 – 42 | 500 | Adjustable switching 100kHz to 25MHz | MSOP |

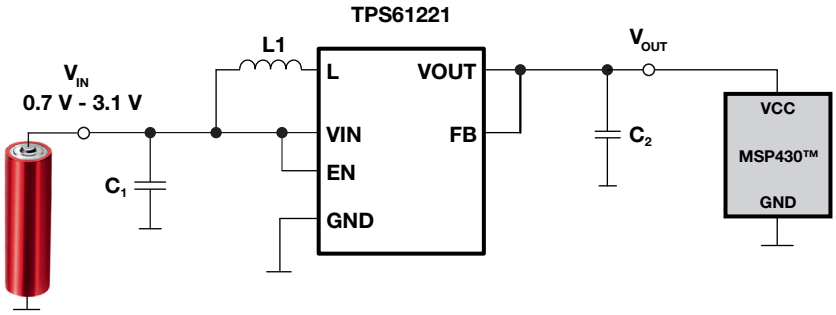
For samples, evaluation boards and reference designs, please check **power.ti.com**, **www.ti.com/processorpower** and **www.ti.com/pmu**

## Ultra-Low Input Voltage: TPS6122x

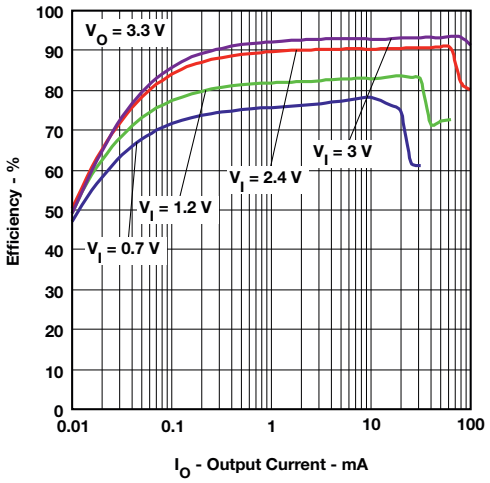
The TPS6122x devices are ideal for powering MCUs operating from batteries including 1- to 3- cell alkaline, NiCd or NiMH. The startup into a load at 0.7-V input voltage, along with overall high efficiency, enables extended use of the battery charge and increases the application run-time.

Overall power consumption can be reduced further by using the pass-through function, setting the DC/DC converter into disable mode while keeping the RTC of the MCU connected to the battery.

**EVM available: TPS61220EVM-319**
**Sample (3.3-V version): TPS61221**




*The fixed 3.3-V device TPS61221 supports input voltages down to 0.7-V.*

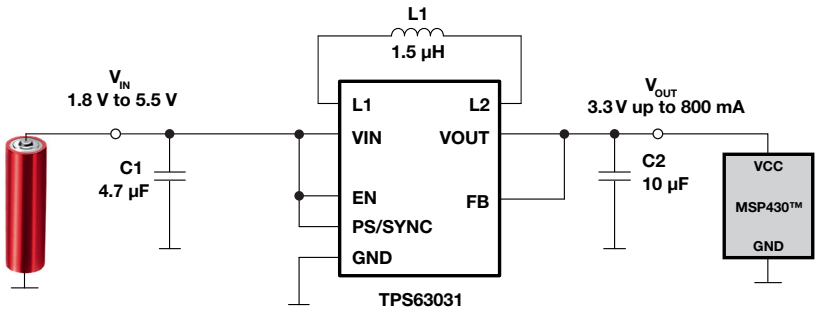



*Efficiency versus output current and input voltage.*

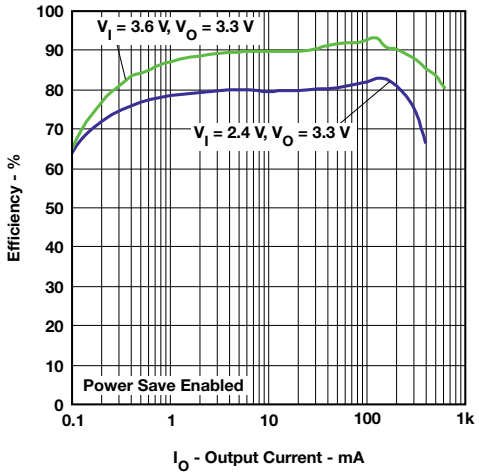
## Wide-Input Voltage Range: TPS6303x

The TPS6303x device family contains fully integrated buck-boost regulators that enable simple design, with no external controls required to maintain a regulated output voltage over the input voltage range (1.8-V to 5.5-V). Portable devices can operate longer, making use of the entire battery charge, with high efficiency over the entire load range.

**EVM available: TPS63030EVM-417**
**Samples (3.3-V version): TPS63031**




*Wide input voltage range enables longer application run-time.*




*The TPS6031's high efficiency extends available battery charge.*

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