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)	lout (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	S0T23-5, S0N-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.



Wide input voltage range enables longer application run-time.

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The TPS6031's high efficiency extends available battery charge.



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