“Wolverine”- based microcontrollers

Slashing all MCU power consumption in half

Texas Instruments

"Wolverine:" Industry's lowest power MCU platform

Ultra-low leakage process technology

- Unique mixed signal ultra-low leakage process technology
- Enables variety of new low-power peripherals
- Consistently low power at any temperature

Unparalleled performance with unified FRAM

- World's lowest power memory type is 250x less energy per bit
- Speed and flexibility of traditional RAM
- Near infinite endurance and 100% non-volatile

MSP430™ DNA Evolved

- Continuing to pioneer the low-power landscape
- Leading power efficiency over entire system architecture
- Industry-leading analog integration
- Complete software package for easiest development

Lowest Memory Power | **Lowest Standby Power** | **Lowest Active Power** | **Lowest Peripheral Power**

Power: More than just one number

Lowest Standby Power

360nA w/ RTC, BOR

- **Standby power: Most battery powered applications spend more than 80% of life in standby power mode, waking up intermittently**

Lowest Peripheral Power

75uA 12-bit ADC

- **Analog power: Microcontroller applications require measurement of real-world analog signals integrated with processor functions**

Lowest Memory Power

250x lower w/ FRAM

- **Data write power: Microcontroller applications often record data in non-volatile memory for use in the application**

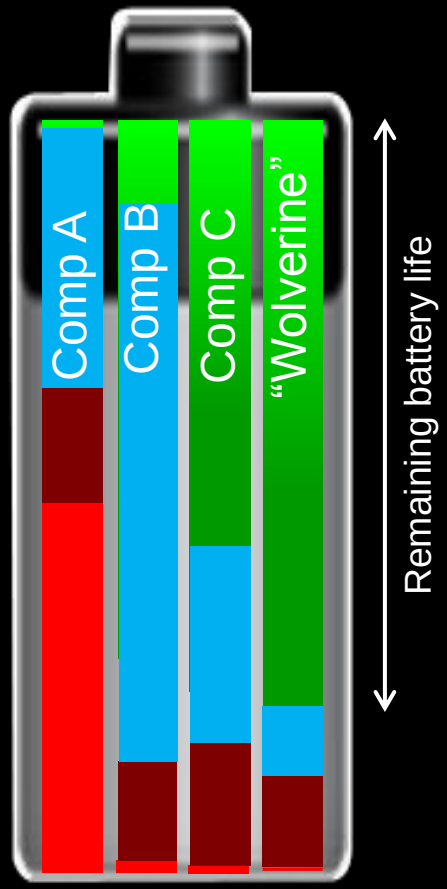
Lowest Active Power

W/ memory access

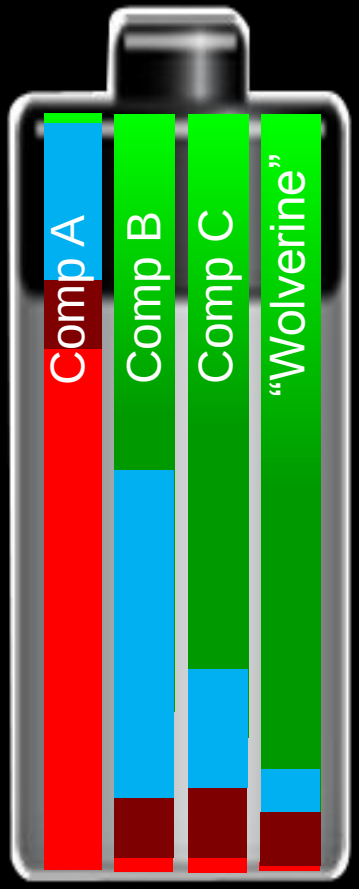
- **Active processing power: Battery-powered applications typically use decision making, basic math and control processing**

Total system power and energy combines all four power metrics

Power: More than just one number impact to battery life



Typical sports fitness application



Typical flow meter application

- Remaining battery life
- Analog
- Active power
- Standby power

Source: TI data and respective company web sites

“Wolverine” : Efficient MCU for simple control applications

Architecture optimized for micro-control applications	• Native bit manipulation • Atomic Operations • Shallow Pipeline for Minimal Latency • Real-time interrupts
Hardware accelerators for common micro-control functions	• Multipliers • Encryption • CRC & random numbers
Fast, lower power data storage with FRAM	• Eliminates need for external EEPROMs • Lowers write power & speed 250x • Offers infinite endurance
Analog and digital integration for complete micro-control solution	• UART, I2C, SPI, PWM, timers • Analog-to-digital converters • Flexible power management and clocking for fast wakeup

MSP: Complete ecosystem

Ultra-low power

World's lowest power MCU

- Ultra-low-power active mode
- 7 low power modes with instant wakeup
- All MSP devices are ultra-low power
- Introducing the ULP "Wolverine" platform

Integration

Intelligent analog & digital peripherals

- Peripherals operate in low power modes
- Minimize physical footprint and bill of materials
- Featuring: FRAM, AES, USB, RF, capacitive touch I/O, metrology engines, LCD, ADC, DAC & MORE

Extensive portfolio, low cost options

Find the right MCU for you

- 400+ devices in production today
- Up 256kB Flash, 18kB RAM, 25+ package options
- Devices starting at $0.25 with MSP430™ Value Line
- Various levels of performance & integration

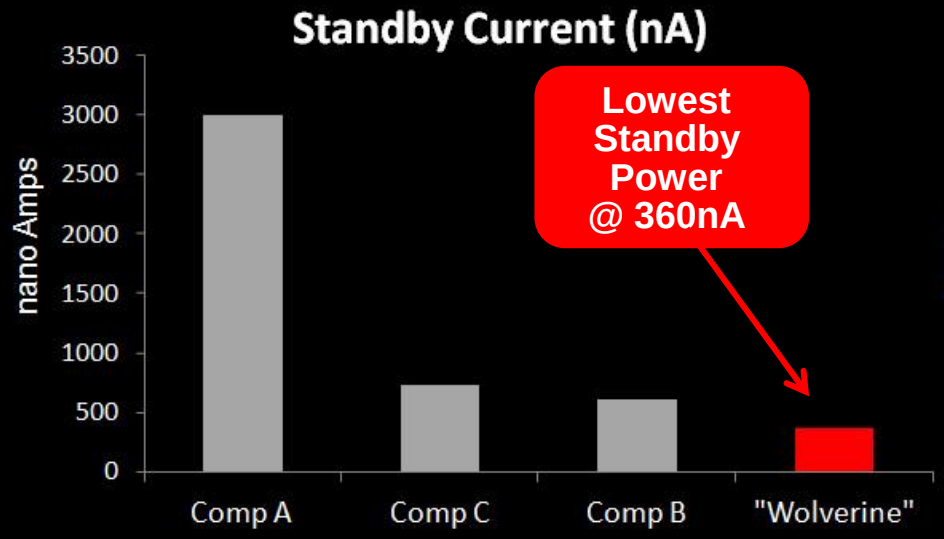
Easy to get started

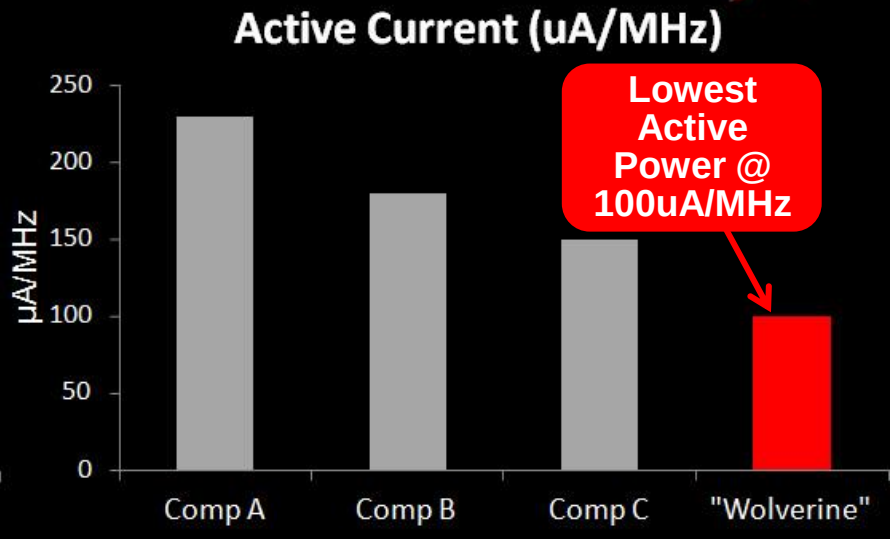
Low cost and simple point of entry

- 1000+ Code Examples for Instant Development
- Speed development with MSP430Ware, GRACE™ software, ULP Advisor™ software
- GUI-based coding & debugging tools available
- Complete development kits starting @ $4.30

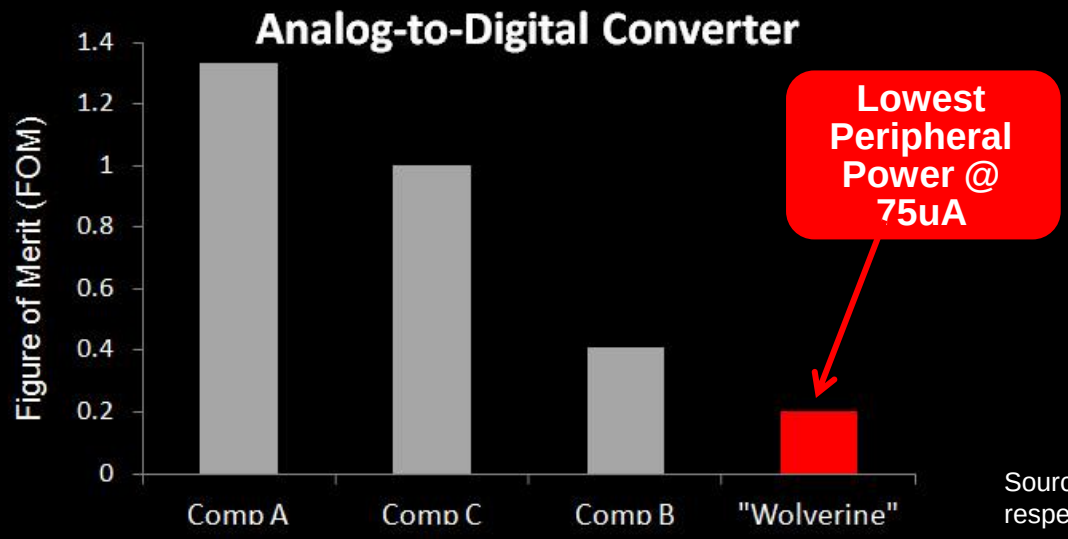
BACKUP

TI's "Wolverine" delivers the lowest power



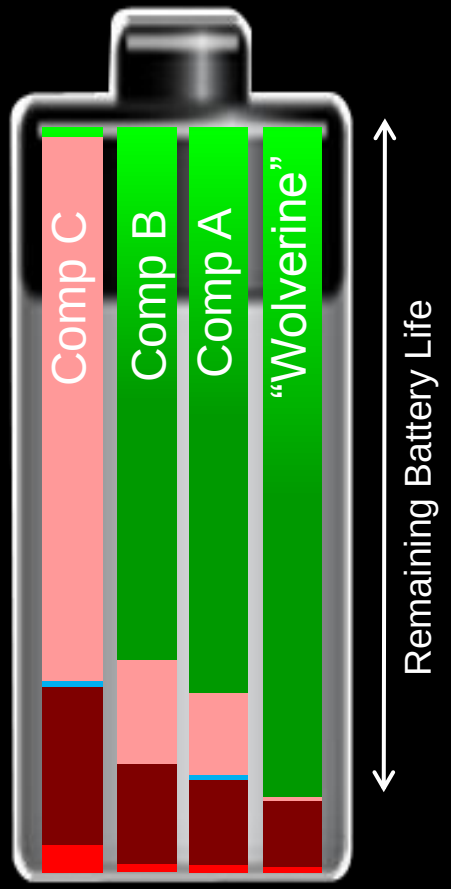


Fast wakeup @ 6.5µs

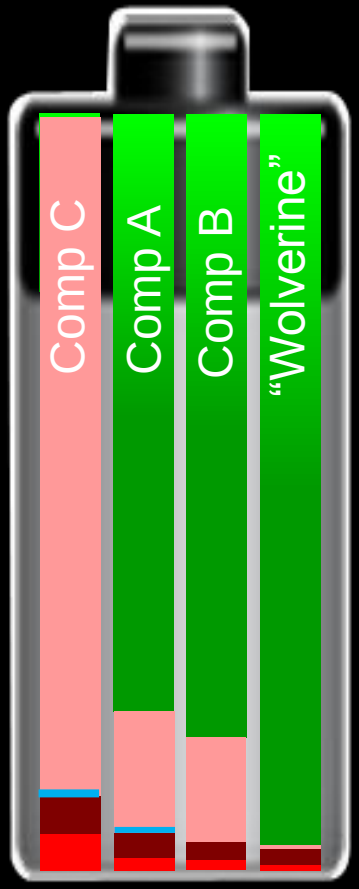


Source: TI data and respective company web sites

Power: More than just one number impact to battery life



Typical Sports Fitness Application



Typical Heat Meter Application

Includes data logging power

- Remaining battery life
- Write component
- ADC12 power
- Active power
- Standby power

Source: TI data and respective company web sites

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