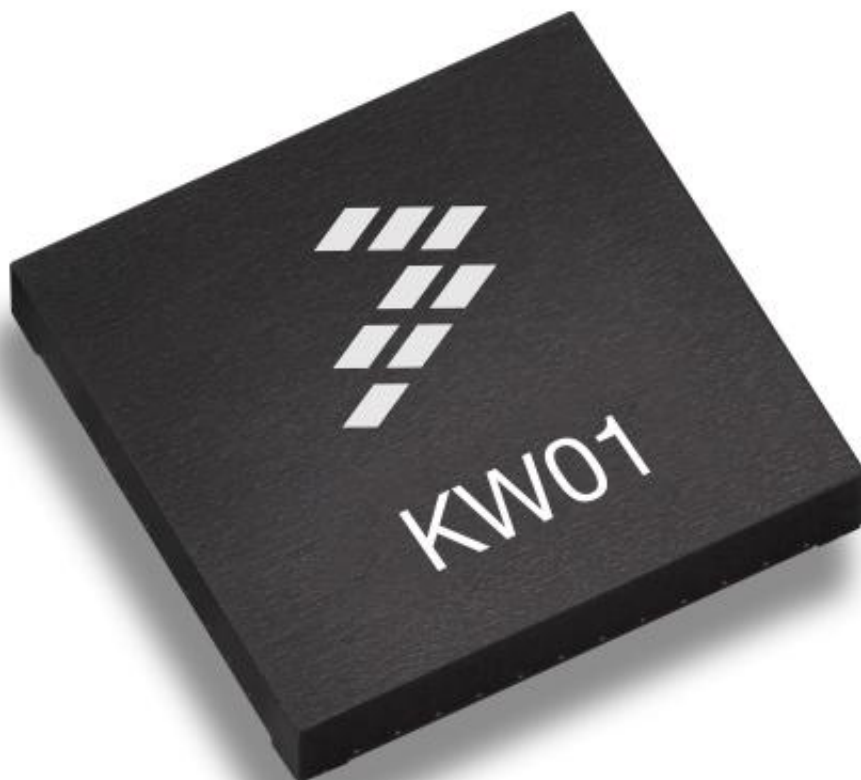


First sub-gigahertz wireless microcontroller using world's most energy-efficient 32-bit processor core

October 9 2012



Freescale Semiconductor (NYSE: FSL) today announced the Kinetis KW01 wireless microcontroller (MCU), expanding its popular Kinetis MCU line with a

device ideally suited for wirelessly networked smart energy applications. Credit: Business Wire

Freescale Semiconductor today announced the Kinetis KW01 wireless microcontroller (MCU), expanding its popular Kinetis MCU line with a device ideally suited for wirelessly networked smart energy applications.

Several protocols are emerging globally for outdoor and indoor smart energy networks that require robust communication and low power consumption. The Kinetis KW01 wireless MCU meets their requirements with a high-performance radio capable of up to 600 Kbps using complex modulation schemes (GFSK, MSK, GMSK and OOK) while operating at multiple frequencies in the range of 290 to 1020 MHz, supporting ISM bands in Japan, USA, Europe, China, India, Brazil, Mexico and others. Additionally, the on-board efficient, low-power CPU system is used to handle numerous network protocols.

For outdoor applications, such as neighborhood area networks that connect many [smart meters](#) to a common data collection point and metropolitan area networks that connect numerous street lamps or sensors, the KW01 wireless MCU can support proprietary protocols and the industry-standard IEEE 802.15.4e/g protocol. For indoor applications connecting wireless sensors, controls, displays, appliances and machinery, the KW01 wireless MCU can support proprietary protocols or standard protocols such as 6LoWPAN, WMBUS (EN13757-4), KNX and ECHONET.

"In a world of evolving wireless protocols for energy management and general control networks, our customers need complete flexibility," said Bruno Baylac, director and general manager of Freescale's Metering, Medical & Connectivity business unit. "The Kinetis KW01 wireless

MCU is able to adapt to multiple protocols, while providing the performance and low power consumption [smart energy](#) applications require."

The Kinetis KW01 MCU is based on an ARM Cortex™-M0+ processor running up to 48 MHz with 128 KB flash memory and 16 KB SRAM capable of consuming as little as 40 uA/MHz in typical conditions. The system and peripherals are designed to achieve 1.7 uA device standby current with a fast wake up time of just 4.3 microseconds, and a device stop current less than 100 nA, which includes radio configuration data retention. These features help maximize battery life in portable systems.

The KW01 device may be used as a comprehensive modem running low-level wireless protocol layers while delegating the upper network protocol layers to run in an external host application processor. The KW01 can also operate without a host for simpler network protocols taking advantage of its on-chip peripherals, such as the 16-bit analog-to-digital converter to implement a single-chip solution for [wireless sensor](#) networking applications.

Kinetis KW01 MCU features

- Radio features
- Benchmark +137 dB budget link for very long range capabilities
- Supports 290-340 MHz, 424-510 MHz, and 862-1020 MHz frequency bands
- Support of multiple modulation schemes (GFSK, MSK, GMSK and OOK)
- Bi-directional over the air data rates from 1 Kbps to 600 Kbps
- Ultra-low-power 32-bit ARM Cortex-M0+ CPU core
- 40 uA/MHz device current during RUN mode
- Less than 100 nA device current during STOP mode

- Multiple, flexible low-power modes including new compute mode that reduces dynamic power by placing peripherals in an asynchronous stop mode
- Memory and peripherals
- 128 KB of on-chip, non-volatile flash memory and 16 KB of RAM for running various communication protocols, from fully proprietary (SMAC - simple media access controller) to globally standardized (IEEE 802.15.4)
- 16-bit analog-to-digital converter
- Touch sense interface

Development support

A comprehensive enablement package that helps simplify development includes:

- PC test tool for a comprehensive evaluation of radio performances and a fast configuration of the radio block
- Out-of-the-box kit experience with certified FCC and CE compliant hardware and software configuration
- Eclipse-based CodeWarrior integrated development environment (IDE) that offers a complete debug module for in-circuit debug and flash
- Tower System modular development platform for rapid prototyping
- Third-party development support, including the IAR IDE, is also available from the extensive ARM ecosystem

Availability

Kinetis KW01 MCU samples are planned for Q4 availability, with volume production in Q1 2013. For more information and pricing, visit

[freescale.com/KW01](https://www.freescale.com/KW01).

Provided by Freescale Semiconductor

Citation: First sub-gigahertz wireless microcontroller using world's most energy-efficient 32-bit processor core (2012, October 9) retrieved 27 April 2024 from

<https://phys.org/news/2012-10-sub-gigahertz-wireless-microcontroller-world-energy-efficient.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.