



IEEE® 802.15.4
solutions for
Kinetis MCUs

Kinetis KW2x Wireless MCUs

The Kinetis KW2x wireless MCU family is based on the ARM® Cortex®-M4 CPU core.

TARGET APPLICATIONS

- ▶ Smart Energy
 - Home energy gateways
 - In-home displays
 - Load control
 - Metering
 - PEV charge monitoring
 - Smart thermostat
 - Solar panel monitoring
- ▶ Commercial and Industrial
 - Asset tracking
 - Building control and monitoring
 - Building HVAC control
 - Fire/security
 - Retail pricing management
 - Security and access control
 - Smart grid and smart metering
 - Usage data collection
- ▶ Residential
 - Access control
 - Curtain/window blind control
 - Intruder alarms
 - Lighting control
 - Remote control
 - Smart thermostats
 - Water heater control
- ▶ Healthcare
 - Asset tracking
 - Fitness monitoring
 - Home healthcare
 - Institutional care
 - Medication asset
 - Monitoring/billing
 - Patient monitoring



OVERVIEW

The Kinetis KW2x MCU integrates a class-leading 2.4 GHz RF transceiver and a robust feature set for a reliable, secure and low-power IEEE® 802.15.4 wireless solution. These wireless MCUs offer up to 512 KB of flash, 64 KB of RAM and up to 64 KB of FlexMemory. Dual PAN support allows the system to simultaneously participate in two networks concurrently, eliminating the need for multiple radio transceivers. The Thread networking protocol stack and the ZigBee® stack are seamlessly integrated into the Kinetis software development kit for rapid creation of wireless embedded systems. Several protocol stacks, tools and IDE are compatible with the Kinetis broad microcontroller portfolio.

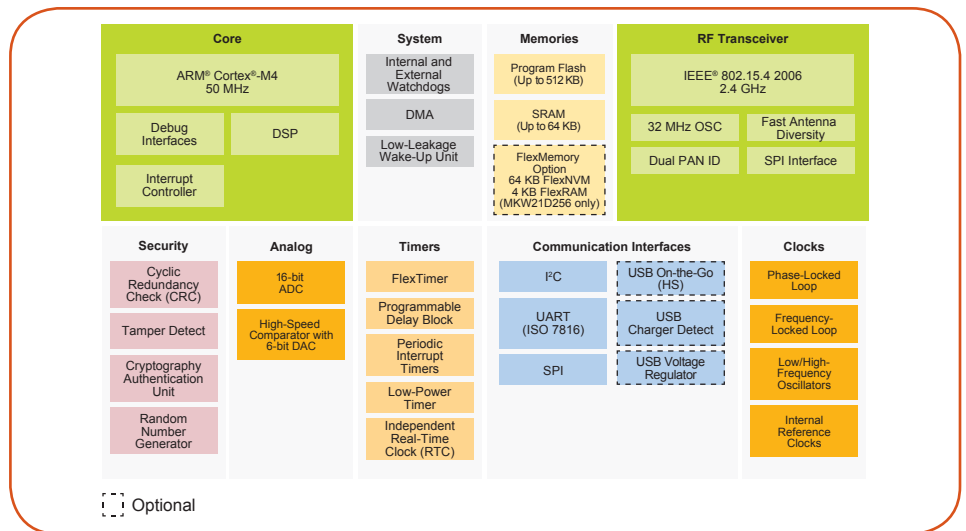
ENABLEMENT

- ▶ Thread protocol certified network stack
 - Router configurations
 - End-Node configurations
- ▶ ZigBee Core Stack and 802.15.4 MAC/PHY fully certified
- ▶ Source code provided for 2 profiles
 - ZigBee Home Automation (ZHA 1.2.1)
 - ZigBee Light Link (ZLL1.0)
- ▶ Source code provided with several demo applications on Thread and ZigBee
- ▶ Kinetis Software Development Kit (SDK) support
- ▶ Freedom Development Platform (2 units per box)
- ▶ USB wireless sniffer for Thread, ZigBee and 802.15.4 MAC

DEVELOPMENT TOOLS

Kit Number	Description
FRDM-KW24D512	Freedom Development Platform (2 boards per box)
USB-KW24D512	USB packet sniffer/dongle

KINETIS KW2X WIRELESS MCU



Features	Benefits
<ul style="list-style-type: none"> • Cortex-M4 core with DSP • Up to 512 KB of flash and up to 64 KB of RAM • Up to 64 KB of FlexMemory (optional) • Secure flash 	<ul style="list-style-type: none"> • Up to 50 MHz core provides a broad range of application support • Large memory footprint provides enough memory to run complicated protocol stacks and user applications on a single IC • FlexMemory provides user-segment byte write/erase EEPROM • Protects code and data from unauthorized access or modification
<ul style="list-style-type: none"> • Tamper detect 	<ul style="list-style-type: none"> • Protects critical IP by detecting tamper events. If a tamper occurs, secure RAM is asynchronously erased and an interrupt can be generated so that the application firmware can take additional actions, including a system reset.
<ul style="list-style-type: none"> • Cryptography acceleration unit 	<ul style="list-style-type: none"> • Coprocessor supports a set of specialized operations to improve throughput of encryption/decryption operations as well as message digest functions, including DES, 3DES, AES, MDA and SHA algorithms
<ul style="list-style-type: none"> • High-performance IEEE 802.15.4-2011 transceiver 	<ul style="list-style-type: none"> • Supports a number of 802.15.4 protocol stacks, including Thread, ZigBee, 6LoWPAN, WirelessHART and ISA 100.11a
<ul style="list-style-type: none"> • Packet processor 	<ul style="list-style-type: none"> • Radio handles many 802.15.4 functions in hardware to reduce the software stack size and reduce power consumption by off loading functions from the CPU
<ul style="list-style-type: none"> • Single ended • Diversity 	<ul style="list-style-type: none"> • Single 50 ohm antenna uses single balun to reduce component count and cost • Fast antenna diversity allows the hardware to automatically select between two antennas for improved reliability in high-interference environments
<ul style="list-style-type: none"> • Dual PAN support 	<ul style="list-style-type: none"> • System can simultaneously participate in two ZigBee networks, eliminating the need for multiple radios
<ul style="list-style-type: none"> • +10 to +8 dBm output power • -102 dBm sensitivity 	<ul style="list-style-type: none"> • 110 dB link budget improves range and lowers cost by reducing the need for external power amplifiers
<ul style="list-style-type: none"> • TX 17 mA @ 0 dBm (CPU sleep) • RX 19 mA max 	<ul style="list-style-type: none"> • Significantly reduces power consumption and extends battery life • Low Power Preamble Search (LPPS) receiver mode
<ul style="list-style-type: none"> • 128-bit random number generator 	<ul style="list-style-type: none"> • Meets the FIPS 140 security requirements for cryptographic modules
<ul style="list-style-type: none"> • 1.8–3.6 V operating range 	<ul style="list-style-type: none"> • Provides wide voltage range to maximize usable voltage for battery operation
<ul style="list-style-type: none"> • Small footprint 	<ul style="list-style-type: none"> • Smaller size and low component count reduces cost
<ul style="list-style-type: none"> • Compatible with Kinetis MCU family 	<ul style="list-style-type: none"> • Software protocol stacks, tools and IDE are compatible with the Kinetis MCUs, including the KW2x
<ul style="list-style-type: none"> • -40 °C to +105 °C operational temperature range 	<ul style="list-style-type: none"> • Ideal for applications that need extended temperature ranges

DEVELOPMENT TOOLS

Device	Flash	RAM	Feature	Package
MKW21D256VHA5	256 KB	32 KB	FlexMemory: 64KB FlexNVM/4KB FlexRAM, No USB	8x8 63-pin LGA
MKW21D512VHA5	512 KB	64 KB	No USB	8x8 63-pin LGA
MKW22D512VHA5	512 KB	64 KB	USB	8x8 63-pin LGA
MKW24D512VHA5	512 KB	64 KB	USB and Smart Energy 2.0	8x8 63-pin LGA