Just like other members of the Kinetis K series portfolio, the Kinetis K1x series MCU family offers a broad selection of pin-, peripheral-, and software-compatible MCU families based on the ARM® Cortex®-M4 core.

**TARGET APPLICATIONS**
- Barcode scanners
- Electronic point of sales (EPOS)
- Flow meters
- Gaming controllers
- HVAC systems
- Home and building automation
- Remote sensors

Kinetis K series MCU families are performance efficient and offer industry-leading low power while providing significant BOM savings through smart on-chip integration. The Kinetis K series MCU portfolio is supported by the most comprehensive set of development tools and software.

The Kinetis K1x MCU family consists of general-purpose MCUs with a variety of memory and integration options. Devices start from 32 KB of flash in a small footprint of 5 x 5 mm 32 QFN package extending up to 1 MB in a 144 MAPBGA package with an optional rich suite of analog, communication, timing and control peripherals. Additionally, its pin compatibility, flexible low-power capabilities and innovative FlexMemory technology help to solve many of the major pain points for embedded designers. Next-generation Kinetis K1x MCUs are further optimized for performance and power consumption and offer more streamlined integration for further BOM cost reductions.

**KINETIS K1x MCU BENEFITS**
- Up to 120 MHz Cortex-M4 core supporting a broad range of processing bandwidth requirement while maintaining excellent cost effectiveness in easy-to-use packages
- Smart integration supporting applications requiring higher performance, lower power and reduction of BOM cost such as: communication peripherals with FIFOs, SPIs with multiple chip selects, UARTs with hardware flow control, multiple internal clock sources (1 kHz, 32 kHz and 4 MHz internal oscillators), superb analog integration with 16-bit ADCs with 12-bit DAC, high-speed comparators, high-precision internal voltage reference and multiple timers with PWM generation capability or very-low-power operation
- Highly reliable, fast access flash memory with four levels of protection for code security/protection
- Outstanding low-power operation with dynamic currents down to 190 µA/MHz, state retention stop mode down to 3.2 µA with 6µS wake-up time and lowest power mode down to 340 nA
- Faster time-to-market with comprehensive enablement solutions, including SDK (drivers, libraries, stacks), IDE, bootloader, RTOS, online community and more
**KINETIS K1x MCU FAMILY**

**KINETIS K1x MCUs**

- **Kinetis software development kit (SDK)**
  - Extensive suite of robust peripheral drivers, stacks and middleware
  - Includes software examples demonstrating the usage of the HAL, peripheral drivers, middleware, and RTOSes
  - Operating system abstraction (OSA) for MQX™ RTOS, FreeRTOS™, and Micrium® µC/OS kernels and BareMetal (no RTOS) applications
- **Processor Expert® software configuration tool**
  - Complimentary software configuration tool providing I/O allocation and pin initialization and configuration of hardware abstraction and peripheral drivers
- **Integrated development environments (IDE)**
  - Atollic® TrueSTUDIO®
  - www.atollic.com/index.php/partnerfreescale
  - Green Hills® Software MULTIBUS
  - www.ghs.com/products/freescale_kinetis.html
  - IAR Embedded Workbench®
  - www.iar.com/kinetis
  - ARM Keil® Microcontroller Development Kit
  - www.keil.com/freescale
  - Kinetic Design Studio IDE
    - No-cost integrated development environment for Kinetis MCUs
    - Eclipse and GCC-based IDE for C/C++ editing, compiling and debugging

**KINETIS K1x MCUs**

<table>
<thead>
<tr>
<th>Kinetis K1x MCU Sub-Family</th>
<th>Kinetis K12 MCUs Baseline</th>
<th>Kinetis K11 MCUs Security Rich</th>
<th>Kinetis K10 MCUs High Mixed-Signal Integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Performance</td>
<td>50 MHz</td>
<td>50 MHz with FPU</td>
<td>72 MHz, 100 MHz, 120 MHz with FPU</td>
</tr>
<tr>
<td>Embedded Memory (Flash, SRAM)</td>
<td>192–512 KB, 32–64 KB</td>
<td>32–160 KB, 8–16 KB</td>
<td>256–1024 KB, 32–128 KB, 1 MB, 128 KB</td>
</tr>
<tr>
<td>Analog</td>
<td>1 x 16-bit ADC, 1 x 12-bit DAC</td>
<td>1 x 16-bit ADC, 1 x 12-bit DAC</td>
<td>2 x 16-bit ADC, 2 x 12-bit DAC</td>
</tr>
<tr>
<td>Security</td>
<td>Hardware encryption and tamper</td>
<td></td>
<td>CAN, FlexBus, CAN, FlexBus, NAND flash controller</td>
</tr>
<tr>
<td>Other features</td>
<td></td>
<td></td>
<td>CAN, FlexBus, N</td>
</tr>
<tr>
<td>Package options</td>
<td>LQFP48, LQFP64, LQFP80, MAP121</td>
<td>LQFP80, MAP121</td>
<td>LQFP80, LQFP100, LQFP144, MAP121, MAP144</td>
</tr>
</tbody>
</table>

**Bootloader**

- Common bootloader for all Kinetis MCUs
- In-system flash programming over a serial connection: erase, program, verify
- ROM or flash-based bootloader with open-source software and host-side programming utilities

**Development Hardware**

- Tower® System development board platform
  - Rapid prototyping and evaluation
  - Low cost, interchangeable modules
- Freedom development boards
  - Low cost (<$30 USD)
  - Arduino® R3 compatible
  - mbd-enabled on select boards

**KINETIS K1x MCU FAMILY**

- Broad ARM technology ecosystem support through NXP Partner Program
- Online enablement with ARM mbed™ development platform
- Rapid and easy Kinetis MCU prototyping and development
- Online mbed™ SDK, developer community
- Free software libraries
- Proprietary MQX RTOS
  - Full-feature RTOS kernel, TCP/IP and USB stacks, file system, shell utility, peripheral drivers, board support packages and more at www.nxp.com/mqx

**www.nxp.com/Kinetis**

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