The Kinetis K series MCU portfolio offers the broadest selection of pin-, peripheral- and software-compatible MCU families based on the ARM® Cortex®-M4 core.

**TARGET APPLICATIONS**
- Building control
- Factory automation
- Home automation
- Industrial drivers
- IoT data concentrators
- Medical monitoring

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

The Kinetis K6x MCU family offers IEEE® 1588 Ethernet, full and optional high-speed USB 2.0 On-The-Go (OTG), including options for crystal-less device functionality. Devices range from 256 KB to 2 MB of flash, with 256 KB of SRAM; packages include BGA, LQFP and WLCSP which span from 100 to 256 pins.

The Kinetis K6x MCU family is a scalable portfolio with various levels of integration, offering a rich suite of analog, communication, timing and control peripherals to accommodate a wide range of requirements.

**COMPREHENSIVE ENABLEMENT SOLUTIONS**
- 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 our proprietary 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 MULTI  
  www.ghs.com/products/freescale_kinetis.html
- IAR Embedded Workbench®  
  www.iar.com
- ARM Keil® microcontroller development kit  
  www.keil.com/freescale
- Kinetis Design Studio IDE
  - No-cost integrated development environment (IDE) for Kinetis MCUs
  - Eclipse and GCC-based IDE for C/C++ editing, compiling and debugging
- Broad ARM 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

KINETIS K6x MCU FAMILY BLOCK DIAGRAM

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

Bootloader

- Common bootloader for all Kinetis MCUs
- In-system flash programming over a serial connection: erase, program, verify

KINETIS K6x MCU BENEFITS

- IEEE® 1588 Ethernet MAC with hardware time stamping provides for precision clock synchronization for real-time industrial control
- Hardware acceleration block helps to optimize the performance of network controllers providing TCP/IP, UDP and ICMP protocol services
- Up to 180 MHz ARM® Cortex®-M4 core supporting a broad range of processing bandwidth requirements while maintaining excellent cost-effectiveness, easy-to-use packages and a wide range of memory densities
- Featuring digital signal processing capabilities with floating-point unit, offering outstanding computational power for control algorithms, sensor data processing and audio processing, among others, while increasing math accuracy and reducing code size
- Hardware encryption coprocessor for secure data transfer and storage with faster (than software) implementations and minimal CPU loading
- Secure digital host controller supports SD, SDIO, MMC or CE-ATA cards for in-application software upgrades, media files or adding Wi-Fi® support
- Outstanding low-power operation with dynamic currents down to 250 μA/MHz, state retention stop mode down to 5.8 μA with 4.5 μS wake-up time and lowest power mode down to 340 nA
- Smart integration supporting applications requiring higher performance, low power and reduction of BOM cost
- Highly reliable, fast access flash memory with four levels of protection for code security/protection
- Faster time-to-market with comprehensive enablement solutions, including SDK (drivers, libraries, stacks), IDE, bootloader, RTOS, online community and more
# KINETIS K6x MCUs: 10/100 ETHERNET MAC WITH FULL-SPEED USB

<table>
<thead>
<tr>
<th>Kinetis K6x MCU Sub-Family</th>
<th>Kinetis K66 MCUs High Performance</th>
<th>Kinetis K65 MCUs High Performance w/ Security</th>
<th>Kinetis K64 MCUs High SRAM</th>
<th>Kinetis K63 MCUs High Mixed-Signal Integration w/ Security</th>
<th>Kinetis K61 MCUs High Mixed-Signal Integration w/ Security</th>
<th>Kinetis K60 MCUs High Mixed-Signal Integration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CPU Performance</strong></td>
<td>180 MHz w/ FPU</td>
<td>120 MHz w/ FPU</td>
<td>120 MHz w/ FPU</td>
<td>120 MHz w/ FPU</td>
<td>120 MHz w/ FPU</td>
<td>120 MHz w/ FPU</td>
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<tr>
<td><strong>Embedded Memory (Flash, SRAM)</strong></td>
<td>Up to 2048 KB, 256 KB</td>
<td>640–1024 KB, 192–256 KB</td>
<td>1024 KB, 256 KB</td>
<td>1024 KB, 128 KB</td>
<td>1024 KB, 128 KB</td>
<td>1024 KB, 128 KB</td>
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<tr>
<td><strong>Analog</strong></td>
<td>2 x 16-bit ADC, 2 x 12-bit DAC</td>
<td>2 x 16-bit ADC, 2 x 12-bit DAC</td>
<td>PGA, 4 x 16-bit ADC, 2 x 12-bit DAC</td>
<td>PGA, 4 x 16-bit ADC, 2 x 12-bit DAC</td>
<td>PGA, 4 x 16-bit ADC, 2 x 12-bit DAC</td>
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<tr>
<td><strong>Security</strong></td>
<td>Hardware encryption</td>
<td>Hardware encryption and tamper detection</td>
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<td>Hardware encryption</td>
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<tr>
<td><strong>Other Features</strong></td>
<td>HS USB w/ PHY, CAN, FlexBus, SDRAM controller</td>
<td>CAN, FlexBus</td>
<td>CAN, FlexBus</td>
<td>CAN, FlexBus, NAND flash controller, HS USB, DDR controller</td>
<td>CAN, FlexBus, NAND Flash controller, HS USB</td>
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<tr>
<td><strong>Package Options</strong></td>
<td>MAP144, LQFP144</td>
<td>WLCSP169, MAP169</td>
<td>MAP100, LQFP144, MAP144, XFBGA121</td>
<td>MAP144, LQFP144</td>
<td>MAP144, LQFP144</td>
<td>MAP144, LQFP144</td>
</tr>
<tr>
<td><strong>Development Board</strong></td>
<td>TWR-K66F180M, FRDM-K66F</td>
<td>TWR-K65F180M, FRDM-K65F</td>
<td>TWR-K64F120M</td>
<td>TWR-K60F120M</td>
<td>TWR-K60F120M</td>
<td>TWR-K60F120M</td>
</tr>
</tbody>
</table>

*Note: Not all features present on each device or development board. Check technical documentation to confirm feature availability per package.*

[www.nxp.com/Kinetis](http://www.nxp.com/Kinetis)