



**THE DATASHEET OF  
MK20DX32VMP5**





High-performance  
microcontrollers  
with USB On-The-Go

## Kinetis® K2x USB MCU Family

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

- ▶ Barcode scanners
- ▶ Electronic point of sale (EPOS)
- ▶ Gaming accessories
- ▶ Health and wellness monitors
- ▶ Home and building automation
- ▶ Industrial/commercial sensor nodes
- ▶ IoT data concentrators
- ▶ Smart grid data concentrators
- ▶ Sports and activity wearables

### FEATURES

The Kinetis K2x MCU family based on the ARM® Cortex®-M4 core offers full and optional high-speed USB 2.0 On-The-Go (OTG), including options for crystal-less device functionality. Devices range from 32 KB to 2 MB of flash with up to 1 MB of SRAM and up to 2 USB controllers; packages include BGA, LQFP, QFN and WLCSP spanning from 32- to 210-pin options.

The Kinetis K2x MCU family is a scalable portfolio with various levels of integration and security. This portfolio offers a rich suite of analog, communication, timing and control peripherals to accommodate a wide range of requirements.

### COMPREHENSIVE ENABLEMENT SOLUTIONS

#### MCUXpresso software development kit (SDK)

- ▶ Pre-integrated, production-grade software including peripheral drivers, connectivity stacks, middleware and RTOS
- ▶ Usage examples for all drivers, stacks and middleware plus sample applications make getting started easy
- ▶ Customizable downloads based on MCU, evaluation board, and component selections

#### MCUXpresso integrated development environment (IDE)

- ▶ Feature-rich IDE based on Eclipse and GCC providing a powerful application development environment
- ▶ MCU-specific debugging views, code trace and profiling, multicore debugging, and more
- ▶ Supports Freedom, Tower® and your custom development boards with debug probes from NXP®, P&E Micro, and SEGGER
- ▶ Available in full-featured free (code size unlimited) and affordable professional editions (including professional support)



## MCUXpresso config tools

- ▶ Graphical pins tool configures the muxing, electrical properties and routing of pins; provides real-time feedback of I/O conflicts and code generation of pin muxing source and header files
- ▶ Graphical clocks tool configures the MCU clock tree system and provides guidance with system fine-tuning

## Ecosystem partner tools

- ▶ IAR Embedded Workbench®
- ▶ ARM Keil® microcontroller development kit
- ▶ ARM mbed™ IoT Device Platform
- ▶ SOMNIUM® DRT Cortex-M IDE
- ▶ Atollic® TrueSTUDIO®



## Development hardware

- ▶ Low-cost Freedom development boards

## Kinetis 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

## KINETIS K2x USB MCU FAMILY BLOCK DIAGRAM



## KINETIS K2x MCU FAMILIES

| Kinetis K2x USB MCUs  |                        |  |  |     |          |                              |             |   |
|---|------------------------|--|--|-----|----------|------------------------------|-------------|---|
|   | CPU<br>ARM® Cortex®-M4 | Memory   | Communications   |     | Security |                              |             | Development Boards                        |
|   |                        |  | USB Controllers  | CAN | RNG      | Symmetric Crypto Accelerator | Anti-Tamper |   |
| <b>K28</b><br>Dual USBs, large memory and PMC w/core voltage bypass | 150 MHz w/FPU          | 2 MB flash<br>1 MB SRAM<br>SDRAM controller<br>QuadSPI interface | 2 x<br>full-speed crystal-less +<br>high-speed w/ HS PHY | –   | Yes      | Yes                          | –           | FRDM-K28F                                 |
| <b>K27</b><br>Dual USBs and large memory                            | 150 MHz w/FPU          | 2 MB flash<br>1 MB SRAM<br>SDRAM controller<br>QuadSPI interface | 2 x<br>full-speed crystal-less +<br>high-speed w/HS PHY  | –   | Yes      | Yes                          | –           | FRDM-K28F                                 |
| <b>K26</b><br>Dual USBs and high performance                        | 180 MHz w/FPU          | 2 MB flash<br>256 KB SRAM<br>SDRAM controller                    | 2 x<br>full-speed crystal-less +<br>high-speed w/HS PHY  | 2   | Yes      | Yes                          | –           | FRDM-K66F<br>TWR-K65F180M                 |
| <b>K24</b><br>Cost-effective and 256 KB SRAM                        | 120 MHz w/FPU          | 1 MB flash<br>256 KB<br>256 KB SRAM                              | 1 x<br>full-speed  | 1*  | Yes      | Yes                          | –           | FRDM-K64F<br>TWR-K64F120M<br>TWR-K24F120M |
| <b>K22</b><br>Cost-effective  | 120 MHz w/FPU          | 640–1024 KB flash<br>128 KB SRAM                                 | 1 x<br>full-speed  | 1   | –        | –                            | –           | TWR-K21F120MA                             |
|   | 120 MHz w/FPU          | 128 KB–1 MB flash<br>48–128 KB SRAM                              | 1 x<br>full-speed crystal-less                           | –   | Yes      | –                            | –           | FRDM-K22F<br>TWR-K22F120M                 |
|   | 100 MHz w/FPU          | 128 KB flash<br>24 KB SRAM                                       | 1 x<br>full-speed  | –   | –        | –                            | –           | FRDM-K22F<br>TWR-K22F120M                 |
|   | 50 MHz                 | 192–512 KB flash<br>32–64 KB SRAM                                | 1 x<br>full-speed  | –   | –        | –                            | –           | TWR-K21D50M                               |
| <b>K21</b><br>Advanced security                                     | 120 MHz w/FPU          | 640 KB–1 MB flash<br>128 KB SRAM                                 | 1 x<br>full-speed  | 1*  | Yes      | Yes                          | Yes         | TWR-K21F120MA                             |
|   | 50 MHz                 | 192–512 KB flash<br>32–64 KB SRAM                                | 1 x<br>full-speed  | 1*  | Yes      | Yes                          | Yes         | TWR-K21D50M                               |
| <b>K20</b><br>High mixed-signal integration                         | 120 MHz w/FPU          | 512 KB–1 MB flash<br>128 KB SRAM<br>NAND controller              | 2 x<br>full-speed +<br>high-speed                        | 2*  | –        | –                            | –           | TWR-K60F120M                              |
|   | 100 MHz                | 256–512 KB flash<br>32–128 KB SRAM                               | 1 x<br>full-speed  | 2*  | –        | –                            | –           | TWR-K60D100M                              |
|   | 72 MHz                 | 96–288 KB flash<br>16–64 KB SRAM                                 | 1 x<br>full-speed  | 2*  | –        | –                            | –           | TWR-K20D72M                               |
|   | 50 MHz                 | 32–160 KB flash<br>8–16 KB SRAM                                  | 1 x<br>full-speed  | 2*  | –        | –                            | –           | TWR-K20D50M                               |

\*Feature only supported by a subset family

**RNG:** Random Number Generator

**FPU:** Floating Point Unit

## Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

- ⊖ [View MK20DX32VMP5 on WIN SOURCE](#)
- ⊖ [Freescale Semiconductor - NXP Information](#)

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