



**THE DATASHEET OF
MK20DN128VLH5**





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

*Feature only supported by a subset family

RNG: Random Number Generator

FPU: Floating Point Unit

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