freescale
Kinetis

Kinetis K Series MCUs

Selector Guide

A Performance and Integration Series
Based on ARM® Cortex®-M4 Cores

August 2014

freescale.com/Kinetis/KSeries

Energy Efficient Solutions by Freescale

Product Longevity

Contents

Kinetis K Series MCUs

Freescale's Kinetis K series MCU portfolio includes more than 600 compatible low-power, high-performance 32-bit MCUs built on the ARM Cortex-M4 core. This series is designed for scalable performance, integration, connectivity, communications, HMI and security, offering additional features for exceptional integration in a variety of package options.

Ultra Scalable – Preserve your engineering investments with hundreds of Kinetis MCUs providing unsurpassed availability and scalability up to 2 MB flash and 256 KB SRAM, while offering software and hardware compatibility.

Optimized Integration – Reduce overall BOM cost with options for smart-on-chip integration including HMI, security, mixed-signal capabilities, and connectivity options such as USB with crystal-less functionality.

Performance and Power Efficiency – Experience the best in performance, up to 120 MHz with floating point unit, and take advantage of extended battery life with multiple low-power modes and enhanced power-conscious peripherals.

Comprehensive Enablement – Speed application development with an extensive suite of software and tools from Freescale and other ARM ecosystem providers.

Package Your Way for Kinetis MCUs

Freescale's Package Your Way program, specific for Kinetis MCUs, takes Kinetis MCU package options to the next level – now offering alternative package options in addition to the existing packages. Alternative packages are additional package options for select Kinetis MCU families, where pin out and pricing information is readily available. These devices are then committed for sampling and production based on customer demand. Learn more at **freescale.com/KPYW**.

Comprehensive Enablement Solutions

Find the information you need to get started at **freescale.com/Kinetis**

Getting Started

- Software and Tools for Kinetis MCUs
- Freescale Solution Advisor
- Kinetis MCU Community

Development Hardware

- Freescale Freedom Development Platforms
- Tower System Development Platforms

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 RTOS
- Operating system abstraction (OSA) for Freescale MQX™ RTOS, FreeRTOS, and Micrium uC/OS kernels and baremetal (no RTOS) applications

Processor Expert Software and Embedded Components

- Complimentary software configuration tool providing IO allocation and pin initialization and configuration of hardware abstraction and peripheral drivers

Integrated Development Environments (IDE)

- Atollic® TrueSTUDIO®
- Green Hills Software MULTI
- IAR Embedded Workbench®
- ARM Keil® MCU Development Kit
- Kinetis Design Studio IDE – No-cost, Eclipse and GCC-based IDE for C/C++ editing, compiling and debugging
- Broad ARM ecosystem support through the Freescale Connect Partner Program

Online Enablement with ARM mbed™ Development Platform

- Rapid and easy prototyping and development for Kinetis MCUs
- Online mbed SDK, Developer Community
- Free software libraries

Freescale MQX RTOS

- Commercial-grade MCU software platform at no cost with optional add-on software and support packages

Kinetis Bootloader

- Common bootloader for 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 K0x Family of Entry-Level MCUs

The Kinetis K0x MCU family, based on the ARM Cortex-M4 core, is the new entry point into the Kinetis K series MCU portfolio and provides a bridge from the Kinetis L series MCU family. Devices start from 64 KB of flash and are offered in several small-footprint package options. The Kinetis K0x MCU family provides the perfect balance of performance and power consumption, running at 100 MHz with floating point unit, while offering low dynamic power consumption and best-in-class static current consumption with more than 10 flexible low-power modes. Each family member combines the ultra-low-power performance with a streamlined level of integration optimized to meet the needs of a broad number of applications. For more information about the Kinetis K0x MCU family, **click here**.

Targeted Applications:

Consumer devices, health and wellness monitors, home and building automation, industrial/commercial sensor nodes, sports and activity wearables

Sub-Family K02: Optimized Entry-Level MCUs

Footnotes	Part Number	CPU Frequency	Pin Count	Package	Total Flash Memory	Flash	SRAM	UART (Total)	High Baudrate UART	PIT (32-bit)	SPI + Chip Selects	I²C	Motor Control General Purpose PWM	Quad Decoder General Purpose PWM	FTM External Clk	Low Power Timer	PDB	Software Watchdog	Hardware Watchdog	Total 16-bit ADC DP	Total 16-bit ADC SE	12-bit DAC	Analog Comparator	Analog Comparator Inputs	Vref	SPFPU	DMA	GPIO (w interrupt)	Evaluation Board (Appendix Page 17)
	MK02FN128VFM10	100 MHz	32	QFN	128 KB	128 KB	16 KB	2	2	1x4ch	4/0/0	1	1x6ch	2x2ch	2	1	1	Y	Y	-	13ch	1	2	2/3/0/0	Y	Y	4ch	26	T5, F2
[1]	MK02FN128VLF10	100 MHz	48	LQFP	128 KB	128 KB	16 KB	2	2	1x4ch	5/0/0	1	1x6ch	2x2ch	2	1	1	Y	Y	1ch	21ch	1	2	3/4/0/0	Y	Y	4ch	35	T5, F2
	MK02FN128VLH10	100 MHz	64	LQFP	128 KB	128 KB	16 KB	2	2	1x4ch	5/0/0	1	1x6ch	2x2ch	2	1	1	Y	Y	2ch	24ch	1	2	6/4/0/0	Y	Y	4ch	46	T5, F2
	MK02FN64VFM10	100 MHz	32	QFN	64 KB	64 KB	16 KB	2	2	1x4ch	4/0/0	1	1x6ch	2x2ch	2	1	1	Y	Y	-	13ch	1	2	2/3/0/0	Y	Y	4ch	26	T5, F2
[1]	MK02FN64VLF10	100 MHz	48	LQFP	64 KB	64 KB	16 KB	2	2	1x4ch	5/0/0	1	1x6ch	2x2ch	2	1	1	Y	Y	1ch	21ch	1	2	3/4/0/0	Y	Y	4ch	35	T5, F2
	MK02FN64VLH10	100 MHz	64	LQFP	64 KB	64 KB	16 KB	2	2	1x4ch	5/0/0	1	1x6ch	2x2ch	2	1	1	Y	Y	2ch	24ch	1	2	6/4/0/0	Y	Y	4ch	46	T5, F2

Common Features

Temp Range: -40 C to 105 C
Voltage Range: 1.71–3.6 V, Flash Write Voltage: 1.71

Main OSC (Oscillator Crystal/Resonator): 32–40 KHz/8–32 MHz
48 MHz IRC, High Drive GPIOs (18 mA): 8

Debug: JTAG, cJTAG, SWD, PMC, MCG, NMI, CRC, DSP,
Trace: TPIU, FPB, DWT, ITM

Footnotes

[1] Package Your Way (PYW)

Kinetis K1x Family of Baseline MCUs

The Kinetis K1x MCU family, based on ARM Cortex-M4 core, 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-pin QFN package extending up to 1 MB in a 144-pin MAPBGA package with an optional rich suite of analog, communication, timing and control peripherals. Additionally, its pin compatibility, flexible low-power capabilities and innovative flex memory 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, offering more streamlined integration for further BOM cost reductions. For more information about the Kinetis K1x MCU family, **click here**.

Targeted Applications:

Barcode scanners, electronic point-of-sales (EPOS) terminals, flow meters, gaming controllers, HVAC systems, home and building automation, remote sensors

Sub-Family K10: Basic MCU with Mixed-Signal Integration

Footnotes	Part Number	CPU Frequency	Pin Count	Package	Total Flash Memory	Flash	FlexNVM	EEPROM/FlexRAM	SRAM	UART (Total)	High Baudrate UART w/ISO7816	High Baudrate UART	Enhanced SDHC (bit)	SPI + Chip Selects	I²C	I²S	CAN	Motor Control General Purpose PWM	Quad Decoder General Purpose PWM	FTM External Clk	Low Power Timer	PDB	Total 16-bit ADC DP	Total 16-bit ADC SE	PGA	12-bit DAC	Analog Comparator	Analog Comparator Inputs	Vref	Cache	MPU	SPFPU	DMA	5 V Tolerant	GPIO (w interrupt)	Evaluation Board (Appendix Page 17)
	MK10DN128VFM5	50 MHz	32	QFN	128 KB	128 KB	-	-	16 KB	3	1	1	-	4/0/0	1	1	-	1x8ch	1x2ch	2	1	1	-	10ch	-	-	2	2/2/0/0	-	-	-	-	4ch	-	24	T1,F1
	MK10DN128VFT5	50 MHz	48	QFN	128 KB	128 KB	-	-	16 KB	3	1	1	-	5/0/0	1	1	-	1x8ch	1x2ch	2	1	1	1ch	16ch	-	-	2	3/3/0/0	Y	-	-	-	4ch	-	33	T1,F1
	MK10DN128VLF5	50 MHz	48	LQFP	128 KB	128 KB	-	-	16 KB	3	1	1	-	5/0/0	1	1	-	1x8ch	1x2ch	2	1	1	1ch	16ch	-	-	2	3/3/0/0	Y	-	-	-	4ch	-	33	T1,F1
	MK10DN128VLH5	50 MHz	64	LQFP	128 KB	128 KB	-	-	16 KB	3	1	1	-	5/0/0	1	1	-	1x8ch	1x2ch	2	1	1	2ch	19ch	-	-	2	6/4/0/0	Y	-	-	-	4ch	-	44	T1,F1
	MK10DN128VMP5	50 MHz	64	MAPBGA	128 KB	128 KB	-	-	16 KB	3	1	1	-	5/0/0	1	1	-	1x8ch	1x2ch	2	1	1	2ch	19ch	-	-	2	6/4/0/0	Y	-	-	-	4ch	-	44	T1,F1
	MK10DN32VFM5	50 MHz	32	QFN	32 KB	32 KB	-	-	8 KB	3	1	1	-	4/0/0	1	1	-	1x8ch	1x2ch	2	1	1	-	10ch	-	-	2	2/2/0/0	-	-	-	-	4ch	-	24	T1,F1
	MK10DN32VFT5	50 MHz	48	QFN	32 KB	32 KB	-	-	8 KB	3	1	1	-	5/0/0	1	1	-	1x8ch	1x2ch	2	1	1	1ch	16ch	-	-	2	3/3/0/0	Y	-	-	-	4ch	-	33	T1,F1
	MK10DN32VLF5	50 MHz	48	LQFP	32 KB	32 KB	-	-	8 KB	3	1	1	-	5/0/0	1	1	-	1x8ch	1x2ch	2	1	1	1ch	16ch	-	-	2	3/3/0/0	Y	-	-	-	4ch	-	33	T1,F1
	MK10DN32VLH5	50 MHz	64	LQFP	32 KB	32 KB	-	-	8 KB	3	1	1	-	5/0/0	1	1	-	1x8ch	1x2ch	2	1	1	2ch	19ch	-	-	2	6/4/0/0	Y	-	-	-	4ch	-	44	T1,F1
	MK10DN32VMP5	50 MHz	64	MAPBGA	32 KB	32 KB	-	-	8 KB	3	1	1	-	5/0/0	1	1	-	1x8ch	1x2ch	2	1	1	2ch	19ch	-	-	2	6/4/0/0	Y	-	-	-	4ch	-	44	T1,F1
	MK10DN64VFM5	50 MHz	32	QFN	64 KB	64 KB	-	-	16 KB	3	1	1	-	4/0/0	1	1	-	1x8ch	1x2ch	2	1	1	-	10ch	-	-	2	2/2/0/0	-	-	-	-	4ch	-	24	T1,F1
	MK10DN64VFT5	50 MHz	48	QFN	64 KB	64 KB	-	-	16 KB	3	1	1	-	5/0/0	1	1	-	1x8ch	1x2ch	2	1	1	1ch	16ch	-	-	2	3/3/0/0	Y	-	-	-	4ch	-	33	T1,F1
	MK10DN64VLF5	50 MHz	48	LQFP	64 KB	64 KB	-	-	16 KB	3	1	1	-	5/0/0	1	1	-	1x8ch	1x2ch	2	1	1	1ch	16ch	-	-	2	3/3/0/0	Y	-	-	-	4ch	-	33	T1,F1
	MK10DN64VLH5	50 MHz	64	LQFP	64 KB	64 KB	-	-	16 KB	3	1	1	-	5/0/0	1	1	-	1x8ch	1x2ch	2	1	1	2ch	19ch	-	-	2	6/4/0/0	Y	-	-	-	4ch	-	44	T1,F1
	MK10DN64VMP5	50 MHz	64	MAPBGA	64 KB	64 KB	-	-	16 KB	3	1	1	-	5/0/0	1	1	-	1x8ch	1x2ch	2	1	1	2ch	19ch	-	-	2	6/4/0/0	Y	-	-	-	4ch	-	44	T1,F1
	MK10DX128VFM5	50 MHz	32	QFN	160 KB	128 KB	32 KB	2 KB	16 KB	3	1	1	-	4/0/0	1	1	-	1x8ch	1x2ch	2	1	1	-	10ch	-	-	2	2/2/0/0	-	-	-	-	4ch	-	24	T1,F1
	MK10DX128VFT5	50 MHz	48	QFN	160 KB	128 KB	32 KB	2 KB	16 KB	3	1	1	-	5/0/0	1	1	-	1x8ch	1x2ch	2	1	1	1ch	16ch	-	-	2	3/3/0/0	Y	-	-	-	4ch	-	33	T1,F1
	MK10DX128VLF5	50 MHz	48	LQFP	160 KB	128 KB	32 KB	2 KB	16 KB	3	1	1	-	5/0/0	1	1	-	1x8ch	1x2ch	2	1	1	1ch	16ch	-	-	2	3/3/0/0	Y	-	-	-	4ch	-	33	T1,F1
	MK10DX128VLH5	50 MHz	64	LQFP	160 KB	128 KB	32 KB	2 KB	16 KB	3	1	1	-	5/0/0	1	1	-	1x8ch	1x2ch	2	1	1	2ch	19ch	-	-	2	6/4/0/0	Y	-	-	-	4ch	-	44	T1,F1
	MK10DX128VMP5	50 MHz	64	MAPBGA	160 KB	128 KB	32 KB	2 KB	16 KB	3	1	1	-	5/0/0	1	1	-	1x8ch	1x2ch	2	1	1	2ch	19ch	-	-	2	6/4/0/0	Y	-	-	-	4ch	-	44	T1,F1
	MK10DX32VFM5	50 MHz	32	QFN	64 KB	32 KB	32 KB	2 KB	8 KB	3	1	1	-	4/0/0	1	1	-	1x8ch	1x2ch	2	1	1	-	10ch	-	-	2	2/2/0/0	-	-	-	-	4ch	-	24	T1,F1
	MK10DX32VFT5	50 MHz	48	QFN	64 KB	32 KB	32 KB	2 KB	8 KB	3	1	1	-	5/0/0	1	1	-	1x8ch	1x2ch	2	1	1	1ch	16ch	-	-	2	3/3/0/0	Y	-	-	-	4ch	-	33	T1,F1
	MK10DX32VLF5	50 MHz	48	LQFP	64 KB	32 KB	32 KB	2 KB	8 KB	3	1	1	-	5/0/0	1	1	-	1x8ch	1x2ch	2	1	1	1ch	16ch	-	-	2	3/3/0/0	Y	-	-	-	4ch	-	33	T1,F1
	MK10DX32VLH5	50 MHz	64	LQFP	64 KB	32 KB	32 KB	2 KB	8 KB	3	1	1	-	5/0/0	1	1	-	1x8ch	1x2ch	2	1	1	2ch	19ch	-	-	2	6/4/0/0	Y	-	-	-	4ch	-	44	T1,F1
	MK10DX32VMP5	50 MHz	64	MAPBGA	64 KB	32 KB	32 KB	2 KB	8 KB	3	1	1	-	5/0/0	1	1	-	1x8ch	1x2ch	2	1	1	2ch	19ch	-	-	2	6/4/0/0	Y	-	-	-	4ch	-	44	T1,F1
	MK10DX64VFM5	50 MHz	32	QFN	96 KB	64 KB	32 KB	2 KB	16 KB	3	1	1	-	4/0/0	1	1	-	1x8ch	1x2ch	2	1	1	-	10ch	-	-	2	2/2/0/0	-	-	-	-	4ch	-	24	T1,F1
	MK10DX64VFT5	50 MHz	48	QFN	96 KB	64 KB	32 KB	2 KB	16 KB	3	1	1	-	5/0/0	1	1	-	1x8ch	1x2ch	2	1	1	1ch	16ch	-	-	2	3/3/0/0	Y	-	-	-	4ch	-	33	T1,F1
	MK10DX64VLF5	50 MHz	48	LQFP	96 KB	64 KB	32 KB	2 KB	16 KB	3	1	1	-	5/0/0	1	1	-	1x8ch	1x2ch	2	1	1	1ch	16ch	-	-	2	3/3/0/0	Y	-	-	-	4ch	-	33	T1,F1
	MK10DX64VLH5	50 MHz	64	LQFP	96 KB	64 KB	32 KB	2 KB	16 KB	3	1	1	-	5/0/0	1	1	-	1x8ch	1x2ch	2	1	1	2ch	19ch	-	-	2	6/4/0/0	Y	-	-	-	4ch	-	44	T1,F1
	MK10DX64VMP5	50 MHz	64	MAPBGA	96 KB	64 KB	32 KB	2 KB	16 KB	3	1	1	-	5/0/0	1	1	-	1x8ch	1x2ch	2	1	1	2ch	19ch	-	-	2	6/4/0/0	Y	-	-	-	4ch	-	44	T1,F1
	MK10DX128VLH7	72 MHz	64	LQFP	160 KB	128 KB	32 KB	2 KB	32 KB	3	1	1	-	5/0/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	26ch	2	1	3	6/4/2/0	Y	-	-	-	16ch	Y	44	T2
	MK10DX128VLK7	72 MHz	80	LQFP	160 KB	128 KB	32 KB	2 KB	32 KB	4	1	1	-	5/3/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	31ch	2	1	3	6/4/2/0	Y	-	-	-	16ch	Y	56	T2
	MK10DX128VLL7	72 MHz	100	LQFP	160 KB	128 KB	32 KB	2 KB	32 KB	5	1	1	-	6/4/0	2	1	1	1x8ch	2x2ch	2	1	1	4ch	37ch	2	1	3	6/4/2/0	Y	-	-	-	16ch	Y	70	T2
	MK10DX128VMC7	72 MHz	121	MAPBGA	160 KB	128 KB	32 KB	2 KB	32 KB	5	1	1	-	6/4/0	2	1	1	1x8ch	2x2ch	2	1	1	4ch	39ch	2	1	3	6/4/3/0	Y	-	-	-	16ch	Y	74	T2
	MK10DX256VLH7	72 MHz	64	LQFP	288 KB	256 KB	32 KB	2 KB	64 KB	3	1	1	-	5/0/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	26ch	2	1	3	6/4/2/0	Y	-	-	-	16ch	Y	44	T2
	MK10DX256VLK7	72 MHz	80	LQFP	288 KB	256 KB	32 KB	2 KB	64 KB	4	1	1	-	5/3/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	31ch	2	1	3	6/4/2/0	Y	-	-	-	16ch	Y	56	T2
	MK10DX256VLL7	72 MHz	100	LQFP	288 KB	256 KB	32 KB	2 KB	64 KB	5	1	1	-	6/4/0	2	1	1	1x8ch	2x2ch	2	1	1	4ch	37ch	2	1	3	6/4/2/0	Y	-	-	-	16ch	Y	70	T2
	MK10DX256VMC7	72 MHz	121	MAPBGA	288 KB	256 KB	32 KB	2 KB	64 KB	5	1	1	-	6/4/0	2	1	1	1x8ch	2x2ch	2	1	1	4ch	39ch	2	1	3	6/4/3/0	Y	-	-	-	16ch	Y	74	T2
	MK10DX64VLH7	72 MHz	64	LQFP	96 KB	64 KB	32 KB	2 KB	16 KB	3	1	1	-	5/0/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	26ch	2	1	3	6/4/2/0	Y	-	-	-	16ch	Y	44	T2
	MK10DX64VLK7	72 MHz	80	LQFP	96 KB	64 KB	32 KB	2 KB	16 KB	4	1	1	-	5/3/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	31ch	2	1	3	6/4/2/0	Y	-	-	-	16ch	Y	56	T2
	MK10DX64VMC7	72 MHz	121	MAPBGA	96 KB	64 KB	32 KB	2 KB	16 KB	5	1	1	-	6/4/0	2	1	1	1x8ch	2x2ch	2	1	1	4ch	39ch	2	1	3	6/4/2/0	Y	-	-	-	16ch	Y	74	T2
[1]	MK10DN512VLK10	100 MHz	80	LQFP	512 KB	512KB	-	-	128 KB	4	1	1	4	5/3/0	2	1	2	1x8ch	2x2ch	2	1	1	2ch	31ch	2	1	3	6/4/2/0	Y	-	Y	-	16ch	Y	56	T9
[1]	MK10DN512VLL10	100 MHz	100	LQFP	512 KB	512KB	-	-	128 KB	5	1	1	4	6/4/1	2	1	2	1x8ch	2x2ch	2	1	1	4ch	37ch	2	1	3	6/4/2/0	Y	-	Y	-	16ch	Y	70	T9
[1]	MK10DN512VLQ10	100 MHz	144	LQFP	512 KB	512KB	-	-	128 KB	6	1	1	8	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	46ch	2	2	3	6/5/4/0	Y	-	Y	-	16ch	Y	104	T9
[1]	MK10DN512VMC10	100 MHz	121	MAPBGA	512 KB	512KB	-	-	128 KB	6	1	1	8	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	42ch	2	2	3	6/4/3/0	Y	-	Y	-	16ch	Y	90	T9
[1]	MK10DN512VMD10	100 MHz	144	MAPBGA	512 KB	512KB	-	-	128 KB	6	1	1	8	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	46ch	2	2	3	6/5/4/0	Y	-	Y	-	16ch	Y	104	T9
[1]	MK10DX128VLQ10	100 MHz	144	LQFP	256 KB	128 KB	128 KB	4 KB	32 KB	6	1	1	8	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	46ch	2	2	3	6/5/4/0	Y	-	Y	-	16ch	Y	104	T9
[1]	MK10DX128VMD10	100 MHz	144	MAPBGA	256 KB	128 KB	128 KB	4 KB	32 KB	6	1	1	8	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	46ch	2	2	3	6/5/4/0	Y	-	Y	-	16ch	Y	104	T9
[1]	MK10DX256VLQ10	100 MHz	144	LQFP	512 KB	256 KB	256 KB	4 KB	64 KB	6	1	1	8	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	46ch	2	2	3	6/5/4/0	Y	-	Y	-	16ch	Y	104	T9
[1]	MK10DX256VMD10	100 MHz	144	MAPBGA	512 KB	256 KB	256 KB	4 KB	64 KB	6	1	1	8	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	46ch	2	2	3	6/5/4/0	Y	-	Y	-	16ch	Y	104	T9
[1,2]	MK10FN1M0VLQ12	120 MHz	144	LQFP	1 MB	1 MB	-	-	128 KB	6	2	0	8	6/4/2	2	2	2	2x8ch	2x2ch	2	1	1	4ch	62ch	4	2	4	5/2/2/5	Y	16 KB	Y	Y	32ch	Y	104	T10
[1,2]	MK10FN1M0VMD12	120 MHz	144	MAPBGA	1 MB	1 MB	-	-	128 KB	6	2	0	8	6/4/2	2	2	2	2x8ch	2x2ch	2	1	1	4ch	62ch	4	2	4	5/2/2/5	Y	16 KB	Y	Y	32ch	Y	104	T10
[1,2]	MK10FX512VLQ12	120 MHz	144	LQFP	1 MB	512 KB	512 KB	16 KB	128 KB	6	2	0	8	6/4/2	2	2	2	2x8ch	2x2ch	2	1	1	4ch	62ch	4	2	4	5/2/2/5	Y	16 KB	Y	Y	32ch	Y	104	T10
[1,2]	MK10FX512VMD12	120 MHz	144	MAPBGA	1 MB	512 KB	512 KB	16 KB	128 KB	6	2	0	8	6/4/2	2	2	2	2x8ch	2x2ch	2	1	1	4ch	62ch	4	2	4	5/2/2/5	Y	16 KB	Y	Y	32ch	Y	104	T10

Common Features

Temp Range: -40 C to 105 C
Voltage Range: 1.71–3.6 V
Flash Write Voltage: 1.71 V

Main OSC: 32–40 KHz/8–32 MHz
Debug: JTAG, cJTAG, SWD
RTC (32 KHz OSC, Vbat)

PIT (32 bit): 1x4ch, TSI (Capacitive Touch): 16ch
Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP
Serial Programming Interface, CMT (Carrier Module Transmitter)
Trace: TPIU, FPB, DWT, ITM

Footnotes

[1] Trace: TPIU, FPB, DWT, ITM,ETM, ETB
[2] Secondary OSC: 32–40 KHz/8–32 MHz,
[2] NAND Flash Controller

Sub-Family K11: Basic MCU with Anti-Tamper/DryICE Solutions

Footnotes	Part Number	CPU Frequency	Pin Count	Package	Total Flash Memory	Flash	FlexNVM	EEPROM/FlexRAM	SRAM	UART (Total)	High Baudrate UART w/ISO7816	High Baudrate UART	SPI + Chip Selects	I²C	I²S	CAN	Motor Control General Purpose PWM	Quad Decoder General Purpose PWM	FTM External Clk	Low Power Timer	PDB	Total 16-bit ADC DP	Total 16-bit ADC SE	PGA	12-bit DAC	Analog Comparator	Analog Comparator Inputs	Vref	Cache	MPU	SPFPU	DMA	GPIO (w interrupt)	Evaluation Board (Appendix Page 17)
	MK11DN512AVLK5	50 MHz	80	LQFP	512 KB	512 KB	–	–	64 KB	4	1	1	5/3/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	24ch	–	–	2	5/4/0/0	–	–	–	–	16ch	60	T3
	MK11DN512AVMC5	50 MHz	121	MAPBGA	512 KB	512 KB	–	–	64 KB	4	1	1	5/3/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	24ch	–	1	2	5/4/0/0	Y	–	–	–	16ch	64	T3
	MK11DN512VLK5	50 MHz	80	LQFP	512 KB	512 KB	–	–	64 KB	4	1	1	5/3/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	24ch	–	–	2	5/4/0/0	–	–	–	–	16ch	60	T3
	MK11DN512VMC5	50 MHz	121	MAPBGA	512 KB	512 KB	–	–	64 KB	4	1	1	5/3/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	24ch	–	1	2	5/4/0/0	Y	–	–	–	16ch	64	T3
	MK11DX128AVLK5	50 MHz	80	LQFP	192 KB	128 KB	64 KB	4 KB	32 KB	4	1	1	5/3/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	24ch	–	–	2	5/4/0/0	–	–	–	–	16ch	60	T3
	MK11DX128AVMC5	50 MHz	121	MAPBGA	192 KB	128 KB	64 KB	4 KB	32 KB	4	1	1	5/3/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	24ch	–	1	2	5/4/0/0	Y	–	–	–	16ch	64	T3
	MK11DX128VLK5	50 MHz	80	LQFP	192 KB	128 KB	64 KB	4 KB	32 KB	4	1	1	5/3/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	24ch	–	–	2	5/4/0/0	–	–	–	–	16ch	60	T3
	MK11DX128VMC5	50 MHz	121	MAPBGA	192 KB	128 KB	64 KB	4 KB	32 KB	4	1	1	5/3/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	24ch	–	1	2	5/4/0/0	Y	–	–	–	16ch	64	T3
	MK11DX256AVLK5	50 MHz	80	LQFP	320 KB	256 KB	64 KB	4 KB	32 KB	4	1	1	5/3/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	24ch	–	–	2	5/4/0/0	–	–	–	–	16ch	60	T3
	MK11DX256AVMC5	50 MHz	121	MAPBGA	320 KB	256 KB	64 KB	4 KB	32 KB	4	1	1	5/3/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	24ch	–	1	2	5/4/0/0	Y	–	–	–	16ch	64	T3
	MK11DX256VLK5	50 MHz	80	LQFP	320 KB	256 KB	64 KB	4 KB	32 KB	4	1	1	5/3/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	24ch	–	–	2	5/4/0/0	–	–	–	–	16ch	60	T3
	MK11DX256VMC5	50 MHz	121	MAPBGA	320 KB	256 KB	64 KB	4 KB	32 KB	4	1	1	5/3/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	24ch	–	1	2	5/4/0/0	Y	–	–	–	16ch	64	T3

Common Features

Temp Range: -40 C to 105 C
Voltage Range: 1.71–3.6 V, Flash Write Voltage: 1.71

Main OSC (Oscillator Crystal/Resonator): 32–40 KHz/8–32 MHz
Debug: JTAG, cJTAG, SWD, RTC (32 KHz OSC, Vbat)

PIT (32 bit): 1x4ch
Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP
Serial Programming Interface, CMT (Carrier Module Transmitter)

Hardware Encryption and Tamper Detect
Trace: TPIU, FPB, DWT, ITM, ETM

Sub-Family K12: Optimized Baseline MCU

Footnotes	Part Number	CPU Frequency	Pin Count	Package	Total Flash Memory	Flash	FlexNVM	EEPROM/FlexRAM	SRAM	UART (Total)	High Baudrate UART w/ISO7816	High Baudrate UART	SPI + Chip Selects	I²C	I²S	CAN	Motor Control General Purpose PWM	Quad Decoder General Purpose PWM	FTM External Clk	Low Power Timer	PDB	Total 16-bit ADC DP	Total 16-bit ADC SE	PGA	12-bit DAC	Analog Comparator	Analog Comparator Inputs	Vref	Cache	MPU	SPFPU	DMA	GPIO (w interrupt)	Evaluation Board (Appendix Page 17)
	MK12DN512VLH5	50 MHz	64	LQFP	512 KB	512 KB	–	–	64 KB	3	1	1	5/0/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	2ch	22ch	–	1	2	4/ 2/0/0	Y	–	–	–	16ch	44	T3
	MK12DN512VLK5	50 MHz	80	LQFP	512 KB	512 KB	–	–	64 KB	4	1	1	5/3/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	24ch	–	1	2	4/2/0/0	Y	–	–	–	16ch	60	T3
	MK12DN512VMC5	50 MHz	121	MAPBGA	512 KB	512 KB	–	–	64 KB	4	1	1	5/3/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	24ch	–	1	2	4/2/0/0	Y	–	–	–	16ch	60	T3
	MK12DX128VLF5	50 MHz	48	LQFP	192 KB	128 KB	64 KB	4 KB	32 KB	3	1	1	5/0/0	1	1	–	1x8ch	1x2ch	2	1	1	1ch	18ch	–	–	2	2/2/0/0	Y	–	–	–	16ch	33	T3
	MK12DX128VLH5	50 MHz	64	LQFP	192 KB	128 KB	64 KB	4 KB	32 KB	3	1	1	5/0/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	2ch	22ch	–	1	2	4/2/0/0	Y	–	–	–	16ch	44	T3
	MK12DX128VLK5	50 MHz	80	LQFP	192 KB	128 KB	64 KB	4 KB	32 KB	4	1	1	5/3/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	24ch	–	1	2	4/2/0/0	Y	–	–	–	16ch	60	T3
	MK12DX128VMC5	50 MHz	121	MAPBGA	192 KB	128 KB	64 KB	4 KB	32 KB	4	1	1	5/3/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	24ch	–	1	2	4/2/0/0	Y	–	–	–	16ch	60	T3
	MK12DX256VLF5	50 MHz	48	LQFP	320 KB	256 KB	64 KB	4 KB	32 KB	3	1	1	5/0/0	1	1	–	1x8ch	1x2ch	2	1	1	1ch	18ch	–	–	2	2/2/0/0	Y	–	–	–	16ch	33	T3
	MK12DX256VLH5	50 MHz	64	LQFP	320 KB	256 KB	64 KB	4 KB	32 KB	3	1	1	5/0/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	2ch	22ch	–	1	2	4/2/0/0	Y	–	–	–	16ch	44	T3
	MK12DX256VLK5	50 MHz	80	LQFP	320 KB	256 KB	64 KB	4 KB	32 KB	4	1	1	5/3/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	24ch	–	1	2	4/2/0/0	Y	–	–	–	16ch	60	T3
	MK12DX256VMC5	50 MHz	121	MAPBGA	320 KB	256 KB	64 KB	4 KB	32 KB	4	1	1	5/3/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	24ch	–	1	2	4/2/0/0	Y	–	–	–	16ch	60	T3

Common Features

Temp Range: -40 C to 105 C
Voltage Range: 1.71–3.6 V, Flash Write Voltage: 1.71

Main OSC (Oscillator Crystal/Resonator): 32–40 KHz/8–32 MHz
Debug: JTAG, cJTAG, SWD, RTC (32 KHz OSC, Vbat)

PIT (32 bit): 1x4ch
Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP
Serial Programming Interface, CMT (Carrier Module Transmitter)

Trace: TPIU, FPB, DWT, ITM, ETM

Kinetis K2x Family of USB MCUs

The Kinetis K2x MCU family, based on the ARM Cortex-M4 core, is pin, peripheral and software compatible with many of the Kinetis K series MCU families, offering full and high-speed USB 2.0 On-The-Go options, in addition to other features like device charge detect capability and USB crystal-less functionality. This family starts from 32 KB of flash in a 5 x 5 mm 32-pin QFN package extending up to 1 MB in a 144-pin MAPBGA package with up to 256 KB of SRAM. Next-generation Kinetis K2x MCUs are further optimized for performance with industry-leading power consumption, offering more streamlined integration for further BOM cost reductions. For more information about the Kinetis K2x MCU family, **click here**.

Targeted Applications:

Barcode scanners, electronic point-of-sales (EPOS) terminals, gaming accessories, health and wellness monitors, home and building automation, industrial/commercial sensor nodes, IoT data concentrators, multi-functional printers, smart grid data concentrators, sports and activity wearables

Sub-Family K20: USB MCU with Mixed-Signal Integration

Footnotes	Part Number	CPU Frequency	Pin Count	Package	Total Flash Memory	Flash	FlexNVM	EEPROM/FlexRAM	SRAM	UART (Total)	High Baudrate UART w/ISO7816	High Baudrate UART	Enhanced SDHC (bit)	Touch Sensing Inputs (TSI)	SPI + Chip Selects	I²C	I²S	CAN	Motor Control General Purpose PWM	Quad Decoder General Purpose PWM	FTM External Clk	Low Power Timer	PDB	Total 16-bit ADC DP	Total 16-bit ADC SE	PGA	12 -bit DAC	Analog Comparator	Analog Comparator Inputs	Vref	MPU	DMA	5 V Tolerant	GPIO (w interrupt)	Evaluation Board (Appendix Page 17)
	MK20DN128VFM5	50 MHz	32	QFN	128 KB	128 KB	–	–	16 KB	2	1	1	–	16	4/0/0	1	1	–	1x8ch	1x2ch	2	1	1	–	6ch	–	–	2	2/2/0/0	–	–	4ch	–	20	T1,F1
	MK20DN128VFT5	50 MHz	48	QFN	128 KB	128 KB	–	–	16 KB	3	1	1	–	14	5/0/0	1	1	–	1x8ch	1x2ch	2	1	1	1ch	12ch	–	–	2	3/3/0/0	Y	–	4ch	–	29	T1,F1
	MK20DN128VLF5	50 MHz	48	LQFP	128 KB	128 KB	–	–	16 KB	3	1	1	–	14	5/0/0	1	1	–	1x8ch	1x2ch	2	1	1	1ch	12ch	–	–	2	3/3/0/0	Y	–	4ch	–	29	T1,F1
	MK20DN128VLH5	50 MHz	64	LQFP	128 KB	128 KB	–	–	16 KB	3	1	1	–	16	5/0/0	1	1	–	1x8ch	1x2ch	2	1	1	2ch	15ch	–	–	2	6/4/0/0	Y	–	4ch	–	40	T1,F1
	MK20DN128VMP5	50 MHz	64	MAPBGA	128 KB	128 KB	–	–	16 KB	3	1	1	–	16	5/0/0	1	1	–	1x8ch	1x2ch	2	1	1	2ch	15ch	–	–	2	6/4/0/0	Y	–	4ch	–	40	T1,F1
	MK20DN32VFM5	50 MHz	32	QFN	32 KB	32 KB	–	–	8 KB	2	1	1	–	16	4/0/0	1	1	–	1x8ch	1x2ch	2	1	1	–	6ch	–	–	2	2/2/0/0	–	–	4ch	–	20	T1,F1
	MK20DN32VFT5	50 MHz	48	QFN	32 KB	32 KB	–	–	8 KB	3	1	1	–	14	5/0/0	1	1	–	1x8ch	1x2ch	2	1	1	1ch	12ch	–	–	2	3/3/0/0	Y	–	4ch	–	29	T1,F1
	MK20DN32VLF5	50 MHz	48	LQFP	32 KB	32 KB	–	–	8 KB	3	1	1	–	14	5/0/0	1	1	–	1x8ch	1x2ch	2	1	1	1ch	12ch	–	–	2	3/3/0/0	Y	–	4ch	–	29	T1,F1
	MK20DN32VLH5	50 MHz	64	LQFP	32 KB	32 KB	–	–	8 KB	3	1	1	–	16	5/0/0	1	1	–	1x8ch	1x2ch	2	1	1	2ch	15ch	–	–	2	6/4/0/0	Y	–	4ch	–	40	T1,F1
	MK20DN32VMP5	50 MHz	64	MAPBGA	32 KB	32 KB	–	–	8 KB	3	1	1	–	16	5/0/0	1	1	–	1x8ch	1x2ch	2	1	1	2ch	15ch	–	–	2	6/4/0/0	Y	–	4ch	–	40	T1,F1
	MK20DN64VFM5	50 MHz	32	QFN	64 KB	64 KB	–	–	16 KB	2	1	1	–	16	4/0/0	1	1	–	1x8ch	1x2ch	2	1	1	–	6ch	–	–	2	2/2/0/0	–	–	4ch	–	20	T1,F1
	MK20DN64VFT5	50 MHz	48	QFN	64 KB	64 KB	–	–	16 KB	3	1	1	–	14	5/0/0	1	1	–	1x8ch	1x2ch	2	1	1	1ch	12ch	–	–	2	3/3/0/0	Y	–	4ch	–	29	T1,F1
	MK20DN64VLF5	50 MHz	48	LQFP	64 KB	64 KB	–	–	16 KB	3	1	1	–	14	5/0/0	1	1	–	1x8ch	1x2ch	2	1	1	1ch	12ch	–	–	2	3/3/0/0	Y	–	4ch	–	29	T1,F1
	MK20DN64VLH5	50 MHz	64	LQFP	64 KB	64 KB	–	–	16 KB	3	1	1	–	16	5/0/0	1	1	–	1x8ch	1x2ch	2	1	1	2ch	15ch	–	–	2	6/4/0/0	Y	–	4ch	–	40	T1,F1
	MK20DN64VMP5	50 MHz	64	MAPBGA	64 KB	64 KB	–	–	16 KB	3	1	1	–	16	5/0/0	1	1	–	1x8ch	1x2ch	2	1	1	2ch	15ch	–	–	2	6/4/0/0	Y	–	4ch	–	40	T1,F1
	MK20DX128VFM5	50 MHz	32	QFN	160 KB	128 KB	32 KB	2 KB	16 KB	2	1	1	–	16	4/0/0	1	1	–	1x8ch	1x2ch	2	1	1	–	6ch	–	–	2	2/2/0/0	–	–	4ch	–	20	T1,F1
	MK20DX128VFT5	50 MHz	48	QFN	160 KB	128 KB	32 KB	2 KB	16 KB	3	1	1	–	14	5/0/0	1	1	–	1x8ch	1x2ch	2	1	1	1ch	12ch	–	–	2	3/3/0/0	Y	–	4ch	–	29	T1,F1
	MK20DX128VLF5	50 MHz	48	LQFP	160 KB	128 KB	32 KB	2 KB	16 KB	3	1	1	–	14	5/0/0	1	1	–	1x8ch	1x2ch	2	1	1	1ch	12ch	–	–	2	3/3/0/0	Y	–	4ch	–	29	T1,F1
	MK20DX128VLH5	50 MHz	64	LQFP	160 KB	128 KB	32 KB	2 KB	16 KB	3	1	1	–	16	5/0/0	1	1	–	1x8ch	1x2ch	2	1	1	2ch	15ch	–	–	2	6/4/0/0	Y	–	4ch	–	40	T1,F1
	MK20DX128VMP5	50 MHz	64	MAPBGA	160 KB	128 KB	32 KB	2 KB	16 KB	3	1	1	–	16	5/0/0	1	1	–	1x8ch	1x2ch	2	1	1	2ch	15ch	–	–	2	6/4/0/0	Y	–	4ch	–	40	T1,F1
	MK20DX32VFM5	50 MHz	32	QFN	64 KB	32 KB	32 KB	2 KB	8 KB	2	1	1	–	16	4/0/0	1	1	–	1x8ch	1x2ch	2	1	1	–	6ch	–	–	2	2/2/0/0	–	–	4ch	–	20	T1,F1
	MK20DX32VFT5	50 MHz	48	QFN	64 KB	32 KB	32 KB	2 KB	8 KB	3	1	1	–	14	5/0/0	1	1	–	1x8ch	1x2ch	2	1	1	1ch	12ch	–	–	2	3/3/0/0	Y	–	4ch	–	29	T1,F1
	MK20DX32VLF5	50 MHz	48	LQFP	64 KB	32 KB	32 KB	2 KB	8 KB	3	1	1	–	14	5/0/0	1	1	–	1x8ch	1x2ch	2	1	1	1ch	12ch	–	–	2	3/3/0/0	Y	–	4ch	–	29	T1,F1
	MK20DX32VLH5	50 MHz	64	LQFP	64 KB	32 KB	32 KB	2 KB	8 KB	3	1	1	–	16	5/0/0	1	1	–	1x8ch	1x2ch	2	1	1	2ch	15ch	–	–	2	6/4/0/0	Y	–	4ch	–	40	T1,F1
	MK20DX32VMP5	50 MHz	64	MAPBGA	64 KB	32 KB	32 KB	2 KB	8 KB	3	1	1	–	16	5/0/0	1	1	–	1x8ch	1x2ch	2	1	1	2ch	15ch	–	–	2	6/4/0/0	Y	–	4ch	–	40	T1,F1
	MK20DX64VFM5	50 MHz	32	QFN	96 KB	64 KB	32 KB	2 KB	16 KB	2	1	1	–	16	4/0/0	1	1	–	1x8ch	1x2ch	2	1	1	–	6ch	–	–	2	2/2/0/0	–	–	4ch	–	20	T1,F1
	MK20DX64VFT5	50 MHz	48	QFN	96 KB	64 KB	32 KB	2 KB	16 KB	3	1	1	–	14	5/0/0	1	1	–	1x8ch	1x2ch	2	1	1	1ch	12ch	–	–	2	3/3/0/0	Y	–	4ch	–	29	T1,F1
	MK20DX64VLF5	50 MHz	48	LQFP	96 KB	64 KB	32 KB	2 KB	16 KB	3	1	1	–	14	5/0/0	1	1	–	1x8ch	1x2ch	2	1	1	1ch	12ch	–	–	2	3/3/0/0	Y	–	4ch	–	29	T1,F1
	MK20DX64VLH5	50 MHz	64	LQFP	96 KB	64 KB	32 KB	2 KB	16 KB	3	1	1	–	16	5/0/0	1	1	–	1x8ch	1x2ch	2	1	1	2ch	15ch	–	–	2	6/4/0/0	Y	–	4ch	–	40	T1,F1
	MK20DX64VMP5	50 MHz	64	MAPBGA	96 KB	64 KB	32 KB	2 KB	16 KB	3	1	1	–	16	5/0/0	1	1	–	1x8ch	1x2ch	2	1	1	2ch	15ch	–	–	2	6/4/0/0	Y	–	4ch	–	40	T1,F1
	MK20DX128VLH7	72 MHz	64	LQFP	160 KB	128 KB	32 KB	2 KB	32 KB	3	1	1	–	16	5/0/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	22ch	2	1	3	6/4/2/0	Y	–	16ch	Y	40	T2
	MK20DX128VLK7	72 MHz	80	LQFP	160 KB	128 KB	32 KB	2 KB	32 KB	4	1	1	–	16	5/3/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	27ch	2	1	3	6/4/2/0	Y	–	16ch	Y	52	T2
	MK20DX128VLL7	72 MHz	100	LQFP	160 KB	128 KB	32 KB	2 KB	32 KB	5	1	1	–	16	6/4/0	2	1	1	1x8ch	2x2ch	2	1	1	4ch	33ch	2	1	3	6/4/2/0	Y	–	16ch	Y	66	T2
	MK20DX128VMC7	72 MHz	121	MAPBGA	160 KB	128 KB	32 KB	2 KB	32 KB	5	1	1	–	16	6/4/0	2	1	1	1x8ch	2x2ch	2	1	1	4ch	35ch	2	1	3	6/4/3/0	Y	–	16ch	Y	70	T2
	MK20DX256VLH7	72 MHz	64	LQFP	288 KB	256 KB	32 KB	2 KB	64 KB	3	1	1	–	16	5/0/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	22ch	2	1	3	6/4/2/0	Y	–	16ch	Y	40	T2
	MK20DX256VLK7	72 MHz	80	LQFP	288 KB	256 KB	32 KB	2 KB	64 KB	4	1	1	–	16	5/3/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	27ch	2	1	3	6/4/2/0	Y	–	16ch	Y	52	T2
	MK20DX256VLL7	72 MHz	100	LQFP	288 KB	256 KB	32 KB	2 KB	64 KB	5	1	1	–	16	6/4/0	2	1	1	1x8ch	2x2ch	2	1	1	4ch	33ch	2	1	3	6/4/2/0	Y	–	16ch	Y	66	T2
	MK20DX256VMC7	72 MHz	121	MAPBGA	288 KB	256 KB	32 KB	2 KB	64 KB	5	1	1	–	16	6/4/0	2	1	1	1x8ch	2x2ch	2	1	1	4ch	35ch	2	1	3	6/4/3/0	Y	–	16ch	Y	70	T2
	MK20DX64VLH7	72 MHz	64	LQFP	96 KB	64 KB	32 KB	2 KB	16 KB	3	1	1	–	16	5/0/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	22ch	2	1	3	6/4/2/0	Y	–	16ch	Y	40	T2
	MK20DX64VLK7	72 MHz	80	LQFP	96 KB	64 KB	32 KB	2 KB	16 KB	4	1	1	–	16	5/3/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	27ch	2	1	3	6/4/2/0	Y	–	16ch	Y	52	T2
	MK20DX64VMC7	72 MHz	121	MAPBGA	96 KB	64 KB	32 KB	2 KB	16 KB	5	1	1	–	16	6/4/0	2	1	1	1x8ch	2x2ch	2	1	1	4ch	35ch	2	1	3	6/4/3/0	Y	–	16ch	Y	70	T2
[1]	MK20DN512VLK10	100 MHz	80	LQFP	512 KB	512 KB	–	–	128 KB	4	1	1	4	16	5/3/0	2	1	2	1x8ch	2x2ch	2	1	1	2ch	27ch	2	1	3	6/4/2/0	Y	Y	16ch	Y	52	T9
[1]	MK20DN512VLL10	100 MHz	100	LQFP	512 KB	512 KB	–	–	128 KB	5	1	1	4	16	6/4/1	2	1	2	1x8ch	2x2ch	2	1	1	4ch	33ch	2	1	3	6/4/2/0	Y	Y	16ch	Y	66	T9
[1]	MK20DN512VLQ10	100 MHz	144	LQFP	512 KB	512 KB	–	–	128 KB	6	1	1	8	16	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	42ch	2	2	3	6/5/4/0	Y	Y	16ch	Y	100	T9
[1]	MK20DN512VMC10	100 MHz	121	MAPBGA	512 KB	512 KB	–	–	128 KB	6	1	1	8	16	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	38ch	2	2	3	6/4/3/0	Y	Y	16ch	Y	86	T9

Sub-Family K20: USB MCU with Mixed-Signal Integration (cont.)

Footnotes	Part Number	CPU Frequency	Pin Count	Package	Total Flash Memory	Flash	FlexNVM	EEPROM/FlexRAM	SRAM	UART (Total)	High Baudrate UART w/ISO7816	High Baudrate UART	Enhanced SDHC (bit)	Touch Sensing Inputs (TSI)	SPI + Chip Selects	I²C	I²S	CAN	Motor Control General Purpose PWM	Quad Decoder General Purpose PWM	FTM External Clk	Low Power Timer	PDB	Total 16-bit ADC DP	Total 16-bit ADC SE	PGA	12-bit DAC	Analog Comparator	Analog Comparator Inputs	Vref	MPU	DMA	5 V Tolerant	GPIO (w interrupt)	Evaluation Board (Appendix Page 17)
[1]	MK20DN512VMD10	100 MHz	144	MAPBGA	512 KB	512 KB	–	–	128 KB	6	1	1	8	16	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	42ch	2	2	3	6/5/4/0	Y	Y	16ch	Y	100	T9
[1,3]	MK20DN512ZCAB10R	100 MHz	120	WLCSP	512 KB	512 KB	–	–	128 KB	6	1	1	4	16	6/4/1	2	1	2	1x8ch	2x2ch	2	1	1	4ch	38ch	2	2	3	6/5/3/0	Y	Y	16ch	Y	79	T9
[1]	MK20DX128VLQ10	100 MHz	144	LQFP	256 KB	128 KB	128 KB	4 KB	32 KB	6	1	1	8	16	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	42ch	2	2	3	6/5/4/0	Y	Y	16ch	Y	100	T9
[1]	MK20DX128VMD10	100 MHz	144	MAPBGA	256 KB	128 KB	128 KB	4 KB	32 KB	6	1	1	8	16	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	42ch	2	2	3	6/5/4/0	Y	Y	16ch	Y	100	T9
[1]	MK20DX256VLK10	100 MHz	80	LQFP	512 KB	256 KB	256 KB	4 KB	64 KB	4	1	1	4	16	5/3/0	2	1	2	1x8ch	2x2ch	2	1	1	2ch	27ch	2	1	3	6/4/2/0	Y	Y	16ch	Y	52	T9
[1]	MK20DX256VLQ10	100 MHz	144	LQFP	512 KB	256 KB	256 KB	4 KB	64 KB	6	1	1	8	16	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	42ch	2	2	3	6/5/4/0	Y	Y	16ch	Y	100	T9
[1]	MK20DX256VMC10	100 MHz	121	MAPBGA	512 KB	256 KB	256 KB	4 KB	64 KB	6	1	1	8	16	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	38ch	2	2	3	6/4/3/0	Y	Y	16ch	Y	86	T9
[1]	MK20DX256VMD10	100 MHz	144	MAPBGA	512 KB	256 KB	256 KB	4 KB	64 KB	6	1	1	8	16	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	42ch	2	2	3	6/5/4/0	Y	Y	16ch	Y	100	T9
[1]	MK20DX256VLL10	100 MHz	100	LQFP	512 KB	256 KB	256 KB	4 KB	64 KB	5	1	1	4	16	6/4/1	2	1	2	1x8ch	2x2ch	2	1	1	4ch	33ch	2	1	3	6/4/2/0	Y	Y	16ch	Y	66	T9
[1,2]	MK20FN1M0VLQ12	120 MHz	144	LQFP	1MB	1MB	–	–	128 KB	6	2	0	8	16	6/4/2	2	2	2	2x8ch	2x2ch	2	1	1	4ch	58ch	4	2	4	5/2/2/5	Y	Y	32ch	Y	100	T10
[1,2]	MK20FN1M0VMD12	120 MHz	144	MAPBGA	1MB	1MB	–	–	128 KB	6	2	0	8	16	6/4/2	2	2	2	2x8ch	2x2ch	2	1	1	4ch	58ch	4	2	4	5/2/2/5	Y	Y	32ch	Y	100	T10
[1,2]	MK20FX512VLQ12	120 MHz	144	LQFP	1MB	512 KB	512 KB	16 KB	128 KB	6	2	0	8	16	6/4/2	2	2	2	2x8ch	2x2ch	2	1	1	4ch	58ch	4	2	4	5/2/2/5	Y	Y	32ch	Y	100	T10
[1,2]	MK20FX512VMD12	120 MHz	144	MAPBGA	1MB	512 KB	512 KB	16 KB	128 KB	6	2	0	8	16	6/4/2	2	2	2	2x8ch	2x2ch	2	1	1	4ch	58ch	4	2	4	5/2/2/5	Y	Y	32ch	Y	100	T10

Common Features
Temp Range: -40 C to 105 C
Voltage Range: 1.71–3.6 V
Flash Write Voltage: 1.71 V

Main OSC: 32–40 KHz/8–32 MHz
Debug: JTAG, cJTAG, SWD
RTC (32 KHz OSC, Vbat)
Trace: TPIU, FPB, DWT, ITM

PIT (32 bit): 1x4ch
Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP
Serial Programming Interface, CMT (Carrier Module Transmitter)
USB OTG LS/FS (1), USB Device Charge Detect, USB 120 mAReg

Footnotes
[1] Trace: TPIU, FPB, DWT, ITM,ETM, ETB
[2] NAND Flash Controller, [2] Cache: 16 KB
[2] Secondary OSC: 32–40 KHz/8–32 MHz, [2] SPFPU
[3] Temp Range: -40 C to 85 C

Sub-Family K21: USB MCU with Anti-Tamper/DryICE Solutions

Footnotes	Part Number	CPU Frequency	Pin Count	Package	Total Flash Memory	Flash	FlexNVM	EEPROM/FlexRAM	SRAM	UART (Total)	High Baudrate UART w/ISO7816	High Baudrate UART	Enhanced SDHC (bit)	SPI + Chip Selects	I²C	I²S	CAN	Motor Control General Purpose PWM	Quad Decoder General Purpose PWM	FTM External Clk	Low Power Timer	PDB	Total 16-bit ADC DP	Total 16-bit ADC SE	12-bit DAC	Analog Comparator	Analog Comparator Inputs	Vref	MPU	SPFPU	DMA	5 V Tolerant	GPIO (w interrupt)	Evaluation Board (Appendix Page 17)
	MK21DN512AVLK5	50 MHz	80	LQFP	512 KB	512 KB	–	–	64 KB	4	1	1	–	5/3/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	20ch	–	2	5/4/0/0	–	–	–	16ch	–	56	T3
	MK21DN512AVMC5	50 MHz	121	MAPBGA	512 KB	512 KB	–	–	64 KB	4	1	1	–	5/3/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	20ch	1	2	5/4/0/0	–	–	–	16ch	–	64	T3
	MK21DN512VLK5	50 MHz	80	LQFP	512 KB	512 KB	–	–	64 KB	4	1	1	–	5/3/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	20ch	–	2	5/4/0/0	–	–	–	16ch	–	56	T3
	MK21DN512VMC5	50 MHz	121	MAPBGA	512 KB	512 KB	–	–	64 KB	4	1	1	–	5/3/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	20ch	1	2	5/4/0/0	–	–	–	16ch	–	64	T3
	MK21DX128AVLK5	50 MHz	80	LQFP	192 KB	128 KB	64 KB	4 KB	32 KB	4	1	1	–	5/3/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	20ch	–	2	5/4/0/0	–	–	–	16ch	–	56	T3
	MK21DX128AVMC5	50 MHz	121	MAPBGA	192 KB	128 KB	64 KB	4 KB	32 KB	4	1	1	–	5/3/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	20ch	1	2	5/4/0/0	–	–	–	16ch	–	64	T3
	MK21DX128VLK5	50 MHz	80	LQFP	192 KB	128 KB	64 KB	4 KB	32 KB	4	1	1	–	5/3/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	20ch	–	2	5/4/0/0	–	–	–	16ch	–	56	T3
	MK21DX128VMC5	50 MHz	121	MAPBGA	192 KB	128 KB	64 KB	4 KB	32 KB	4	1	1	–	5/3/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	20ch	1	2	5/4/0/0	–	–	–	16ch	–	64	T3
	MK21DX256AVLK5	50 MHz	80	LQFP	320 KB	256 KB	64 KB	4 KB	32 KB	4	1	1	–	5/3/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	20ch	–	2	5/4/0/0	–	–	–	16ch	–	56	T3
	MK21DX256AVMC5	50 MHz	121	MAPBGA	320 KB	256 KB	64 KB	4 KB	32 KB	4	1	1	–	5/3/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	20ch	1	2	5/4/0/0	–	–	–	16ch	–	64	T3
	MK21DX256VLK5	50 MHz	80	LQFP	320 KB	256 KB	64 KB	4 KB	32 KB	4	1	1	–	5/3/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	20ch	–	2	5/4/0/0	–	–	–	16ch	–	56	T3
	MK21DX256VMC5	50 MHz	121	MAPBGA	320 KB	256 KB	64 KB	4 KB	32 KB	4	1	1	–	5/3/0	2	1	–	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	20ch	1	2	5/4/0/0	–	–	–	16ch	–	64	T3
[1]	MK21FN1M0AVLQ12	120 MHz	144	LQFP	1MB	1MB	–	–	128 KB	6	1	1	8	6/4/2	3	1	1	1x8ch	2x2ch	2	1	1	4ch	42ch	2	3	6/5/4/0	Y	Y	Y	16ch	Y	100	T4
[1]	MK21FN1M0AVMC12	120 MHz	121	MAPBGA	1MB	1MB	–	–	128 KB	5	1	1	8	6/4/2	3	1	1	1x8ch	2x2ch	2	1	1	4ch	40ch	2	3	6/4/3/0	Y	Y	Y	16ch	Y	81	T4
[1]	MK21FN1M0AVMD12	120 MHz	144	MAPBGA	1MB	1MB	–	–	128 KB	6	1	1	8	6/4/2	3	1	1	1x8ch	2x2ch	2	1	1	4ch	42ch	2	3	6/5/4/0	–	Y	Y	16ch	Y	95	T4
[1]	MK21FN1M0VLQ12	120 MHz	144	LQFP	1MB	1MB	–	–	128 KB	6	1	1	8	6/4/2	3	1	1	1x8ch	2x2ch	2	1	1	4ch	42ch	2	3	6/5/4/0	–	Y	Y	16ch	Y	104	T4
[1]	MK21FN1M0VMC12	120 MHz	121	MAPBGA	1MB	1MB	–	–	128 KB	5	1	1	8	6/4/2	3	1	1	1x8ch	2x2ch	2	1	1	4ch	40ch	2	3	6/4/3/0	Y	Y	Y	16ch	Y	81	T4
[1]	MK21FN1M0VMD12	120 MHz	144	MAPBGA	1MB	1MB	–	–	128 KB	6	1	1	8	6/4/2	3	1	1	1x8ch	2x2ch	2	1	1	4ch	42ch	2	3	6/5/4/0	Y	Y	Y	16ch	Y	104	T4
[1]	MK21FX512AVLQ12	120 MHz	144	LQFP	640 KB	512 KB	128 KB	4 KB	128 KB	6	1	1	8	6/4/2	3	1	1	1x8ch	2x2ch	2	1	1	4ch	42ch	2	3	6/5/4/0	Y	Y	Y	16ch	Y	100	T4
[1]	MK21FX512AVMC12	120 MHz	121	MAPBGA	640 KB	512 KB	128 KB	4 KB	128 KB	5	1	1	8	6/4/2	3	1	1	1x8ch	2x2ch	2	1	1	4ch	40ch	2	3	6/4/3/0	Y	Y	Y	16ch	Y	81	T4
[1]	MK21FX512AVMD12	120 MHz	144	MAPBGA	640 KB	512 KB	128 KB	4 KB	128 KB	6	1	1	8	6/4/2	3	1	1	1x8ch	2x2ch	2	1	1	4ch	42ch	2	3	6/5/4/0	–	Y	Y	16ch	Y	95	T4
[1]	MK21FX512VLQ12	120 MHz	144	LQFP	640 KB	512 KB	128 KB	4 KB	128 KB	6	1	1	8	6/4/2	3	1	1	1x8ch	2x2ch	2	1	1	4ch	42ch	2	3	6/5/4/0	–	Y	Y	16ch	Y	104	T4
[1]	MK21FX512VMC12	120 MHz	121	MAPBGA	640 KB	512 KB	128 KB	4 KB	128 KB	5	1	1	8	6/4/2	3	1	1	1x8ch	2x2ch	2	1	1	4ch	40ch	2	3	6/4/3/0	Y	Y	Y	16ch	Y	81	T4
[1]	MK21FX512VMD12	120 MHz	144	MAPBGA	640 KB	512 KB	128 KB	4 KB	128 KB	6	1	1	8	6/4/2	3	1	1	1x8ch	2x2ch	2	1	1	4ch	42ch	2	3	6/5/4/0	Y	Y	Y	16ch	Y	104	T4

Common Features
Temp Range: -40 C to 105 C
Voltage Range: 1.71–3.6 V
Flash Write Voltage: 1.71 V

Main OSC: 32–40 KHz/8–32 MHz
Debug: JTAG, cJTAG, SWD
RTC (32 KHz OSC, Vbat)
Trace: TPIU, FPB, DWT, ITM, ETM

PIT (32 bit): 1x4ch
Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP
Serial Programming Interface, CMT (Carrier Module Transmitter)
USB OTG LS/FS (1), USB Device Charge Detect, USB 120 mAReg

Footnotes
[1] Trace: TPIU, FPB, DWT, ITM, ETM, ETB

Sub-Family K22: Optimized USB MCU

Footnotes	Part Number	CPU Frequency	Pin Count	Package	Total Flash Memory	Flash	FlexNVM	EEPROM/FlexRAM	SRAM	UART (Total)	High Baudrate UART w/ISO7816	High Baudrate UART	Enhanced SDHC (bit)	SPI + Chip Selects	I²C	I²S	CAN	USB 120 mAReg	Motor Control General Purpose PWM	Quad Decoder General Purpose PWM	FTM External Clk	Low Power Timer	PDB	Total 16-bit ADC DP	Total 16-bit ADC SE	12-bit DAC	Analog Comparator	Analog Comparator Inputs	MPU	SPFPU	DMA	GPIO (w interrupt)	Evaluation Board (Appendix Page 17)
[1,2]	MK22DN512VLH5	50 MHz	64	LQFP	512 KB	512 KB	–	–	64 KB	3	1	1	–	5/0/0	2	1	–	Y	1x8ch + 1x2ch	1x2ch	2	1	1	2ch	18ch	1	2	4/ 2/0/0	–	–	16ch	40	T3
[1,2]	MK22DN512VLK5	50 MHz	80	LQFP	512 KB	512 KB	–	–	64 KB	4	1	1	–	5/3/0	2	1	–	Y	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	20ch	1	2	4/2/0/0	–	–	16ch	56	T3
[1,2]	MK22DN512VMC5	50 MHz	121	MAPBGA	512 KB	512 KB	–	–	64 KB	4	1	1	–	5/3/0	2	1	–	Y	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	20ch	1	2	4/2/0/0	–	–	16ch	56	T3
[1,2]	MK22DX128VLF5	50 MHz	48	LQFP	192 KB	128 KB	64 KB	4 KB	32 KB	3	1	1	–	5/0/0	1	1	–	Y	1x8ch	1x2ch	2	1	1	1ch	14ch	0	2	2/2/0/0	–	–	16ch	29	T3
[1,2]	MK22DX128VLH5	50 MHz	64	LQFP	192 KB	128 KB	64 KB	4 KB	32 KB	3	1	1	–	5/0/0	2	1	–	Y	1x8ch + 1x2ch	1x2ch	2	1	1	2ch	18ch	1	2	4/2/0/0	–	–	16ch	40	T3
[1,2]	MK22DX128VLK5	50 MHz	80	LQFP	192 KB	128 KB	64 KB	4 KB	32 KB	4	1	1	–	5/3/0	2	1	–	Y	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	20ch	1	2	4/2/0/0	–	–	16ch	56	T3
[1,2]	MK22DX128VMC5	50 MHz	121	MAPBGA	192 KB	128 KB	64 KB	4 KB	32 KB	4	1	1	–	5/3/0	2	1	–	Y	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	20ch	1	2	4/2/0/0	–	–	16ch	56	T3
[1,2]	MK22DX256VLF5	50 MHz	48	LQFP	320 KB	256 KB	64 KB	4 KB	32 KB	3	1	1	–	5/0/0	1	1	–	Y	1x8ch	1x2ch	2	1	1	1ch	14ch	0	2	2/2/0/0	–	–	16ch	29	T3
[1,2]	MK22DX256VLH5	50 MHz	64	LQFP	320 KB	256 KB	64 KB	4 KB	32 KB	3	1	1	–	5/0/0	2	1	–	Y	1x8ch + 1x2ch	1x2ch	2	1	1	2ch	18ch	1	2	4/2/0/0	–	–	16ch	40	T3
[1,2]	MK22DX256VLK5	50 MHz	80	LQFP	320 KB	256 KB	64 KB	4 KB	32 KB	4	1	1	–	5/3/0	2	1	–	Y	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	20ch	1	2	4/2/0/0	–	–	16ch	56	T3
[1,2]	MK22DX256VMC5	50 MHz	121	MAPBGA	320 KB	256 KB	64 KB	4 KB	32 KB	4	1	1	–	5/3/0	2	1	–	Y	1x8ch + 1x2ch	1x2ch	2	1	1	3ch	20ch	1	2	4/ 2/0/0	–	–	16ch	56	T3
[1,2,3]	MK22FN1M0VLH12	120 MHz	64	LQFP	1 MB	1 MB	–	–	128 KB	3	1	1	–	5/0/0	3	1	1	Y	2x8ch	2x2ch	2	1	1	2ch	22ch	1	3	6/4/2/0	Y	Y	16ch	40	T4
[1,2,3]	MK22FN1M0VLK12	120 MHz	80	LQFP	1 MB	1 MB	–	–	128 KB	4	1	1	4	5/3/0	3	1	1	Y	2x8ch	2x2ch	2	1	1	3ch	27ch	1	3	6/4/2/0	Y	Y	16ch	52	T4
[1,2,3]	MK22FN1M0VLL12	120 MHz	100	LQFP	1 MB	1 MB	–	–	128 KB	5	1	1	4	6/4/1	3	1	1	Y	2x8ch	2x2ch	2	1	1	5ch	33ch	1	3	6/4/2/0	Y	Y	16ch	66	T4
[1,2,3]	MK22FN1M0VLQ12	120 MHz	144	LQFP	1 MB	1 MB	–	–	128 KB	6	1	1	8	6/4/2	3	1	1	Y	2x8ch	2x2ch	2	1	1	5ch	42ch	2	3	6/5/4/0	Y	Y	16ch	100	T4
[1,2,3]	MK22FN1M0VMC12	120 MHz	121	MAPBGA	1 MB	1 MB	–	–	128 KB	6	1	1	8	6/4/2	3	1	1	Y	2x8ch	2x2ch	2	1	1	5ch	38ch	2	3	6/5/4/0	Y	Y	16ch	86	T4
[1,2,3]	MK22FN1M0VMD12	120 MHz	144	MAPBGA	1 MB	1 MB	–	–	128 KB	6	1	1	8	6/4/2	3	1	1	Y	2x8ch	2x2ch	2	1	1	5ch	42ch	2	3	6/5/4/0	Y	Y	16ch	100	T4
[1,2,3]	MK22FX512VLH12	120 MHz	64	LQFP	640 KB	512 KB	128 KB	4 KB	128 KB	3	1	1	–	5/0/0	3	1	1	Y	2x8ch	2x2ch	2	1	1	2ch	22ch	1	3	6/4/2/0	Y	Y	16ch	40	T4
[1,2,3]	MK22FX512VLK12	120 MHz	80	LQFP	640 KB	512 KB	128 KB	4 KB	128 KB	4	1	1	4	5/3/0	3	1	1	Y	2x8ch	2x2ch	2	1	1	3ch	27ch	1	3	6/4/2/0	Y	Y	16ch	52	T4
[1,2,3]	MK22FX512VLL12	120 MHz	100	LQFP	640 KB	512 KB	128 KB	4 KB	128 KB	5	1	1	4	6/4/1	3	1	1	Y	2x8ch	2x2ch	2	1	1	5ch	33ch	1	3	6/4/2/0	Y	Y	16ch	66	T4
[1,2,3]	MK22FX512VLQ12	120 MHz	144	LQFP	640 KB	512 KB	128 KB	4 KB	128 KB	6	1	1	8	6/4/2	3	1	1	Y	2x8ch	2x2ch	2	1	1	5ch	42ch	2	3	6/5/4/0	Y	Y	16ch	100	T4
[1,2,3]	MK22FX512VMC12	120 MHz	121	MAPBGA	640 KB	512 KB	128 KB	4 KB	128 KB	6	1	1	8	6/4/2	3	1	1	Y	2x8ch	2x2ch	2	1	1	5ch	38ch	2	3	6/5/4/0	Y	Y	16ch	86	T4
[1,2,3]	MK22FX512VMD12	120 MHz	144	MAPBGA	640 KB	512 KB	128 KB	4 KB	128 KB	6	1	1	8	6/4/2	3	1	1	Y	2x8ch	2x2ch	2	1	1	5ch	42ch	2	3	6/5/4/0	Y	Y	16ch	100	T4
[4]	MK22FN128VDC10	100 MHz	121	XFBGA	128 KB	128 KB	–	–	24 KB	4	1	1	–	6/4/0	2	1	–	–	1x8ch	2x2ch	2	1	1	4ch	34ch	1	2	6/4/0/0	–	Y	4ch	67	T5,F2
[4]	MK22FN128VLH10	100 MHz	64	LQFP	128 KB	128 KB	–	–	24 KB	4	1	1	–	5/2/0	2	1	–	–	1x8ch	2x2ch	2	1	1	2ch	22ch	1	2	5/4/0/0	–	Y	4ch	40	T5,F2
[4]	MK22FN128VLL10	100 MHz	100	LQFP	128 KB	128 KB	–	–	24 KB	4	1	1	–	6/4/0	2	1	–	–	1x8ch	2x2ch	2	1	1	4ch	33ch	1	2	5/4/0/0	–	Y	4ch	66	T5,F2
[4]	MK22FN128VMP10	100 MHz	64	MAPBGA	128 KB	128 KB	–	–	24 KB	4	1	1	–	5/2/0	2	1	–	–	1x8ch	2x2ch	2	1	1	2ch	22ch	1	2	5/4/0/0	–	Y	4ch	40	T5,F2
[2,4]	MK22FN256VDC12	120 MHz	121	XFBGA	256 KB	256 KB	–	–	48 KB	4	1	1	–	6/4/0	2	1	–	Y	1x8ch	2x2ch	2	1	1	4ch	36ch	1	2	6/4/0/0	–	Y	16ch	70	T5,F2
[2,4]	MK22FN256VLH12	120 MHz	64	LQFP	256 KB	256 KB	–	–	48 KB	4	1	1	–	5/2/0	2	1	–	Y	1x8ch	2x2ch	2	1	1	2ch	22ch	1	2	5/4/0/0	–	Y	16ch	40	T5,F2
[2,4]	MK22FN256VLL12	120 MHz	100	LQFP	256 KB	256 KB	–	–	48 KB	4	1	1	–	6/4/0	2	1	–	Y	1x8ch	2x2ch	2	1	1	4ch	33ch	1	2	5/4/0/0	–	Y	16ch	66	T5,F2
[2,4,5]	MK22FN256VMP12	120 MHz	64	MAPBGA	256 KB	256 KB	–	–	48 KB	4	1	1	–	5/2/0	2	1	–	Y	1x8ch	2x2ch	2	1	1	2ch	22ch	1	2	5/4/0/0	–	Y	16ch	40	T5,F2
[2,4]	MK22FN512VDC12	120 MHz	121	XFBGA	512 KB	512 KB	–	–	128 KB	4	1	1	–	6/4/0	2	1	–	Y	2x8ch	2x2ch	2	1	1	4ch	38ch	2	2	6/5/0/0	–	Y	16ch	81	T5,F2
[2,4]	MK22FN512VLH12	120 MHz	64	LQFP	512 KB	512 KB	–	–	128 KB	4	1	1	–	5/2/0	2	1	–	Y	2x8ch	2x2ch	2	1	1	2ch	22ch	2	2	5/4/0/0	–	Y	16ch	40	T5,F2
[2,4]	MK22FN512VLL12	120 MHz	100	LQFP	512 KB	512 KB	–	–	128 KB	4	1	1	–	6/4/0	2	1	–	Y	2x8ch	2x2ch	2	1	1	4ch	33ch	2	2	5/4/0/0	–	Y	16ch	66	T5,F2
[2,4]	MK22FN512VMP12	120 MHz	64	MAPBGA	512 KB	512 KB	–	–	128 KB	4	1	1	–	5/2/0	2	1	–	Y	2x8ch	2x2ch	2	1	1	2ch	22ch	2	2	5/4/0/0	–	Y	16ch	40	T5,F2

Common Features
Temp Range: -40 C to 105 C
Voltage Range: 1.71–3.6 V
Flash Write Voltage: 1.71 V

Main OSC (Oscillator crystal/resonator): 32–40 KHz/8–32 MHz
Debug: JTAG, cJTAG, SWD,
RTC (32 KHz OSC, Vbat)
Trace: TPIU, FPB, DWT, ITM, ETM

PIT (32 bit): 1x4ch
Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP
Serial Programming Interface, USB OTG LS/FS (1)
V ref

Footnotes
[1] USB Device Charge Detect, [1] CMT (Carrier Module Transmitter)
[2] USB 120mAReg, [3] 5V Tolerant
[3] Trace: TPIU, FPB, DWT, ITM,ETM, ETB, [4] Low Power UART (1)
[4] Crystal–less USB Enabled (FS Mode ON), [4] 48 MHz IRC
[4] Main OSC: 32–40 KHz/3–32 MHz, [4] High Drive GPIOs (18 mA): 8
[5] Package Your Way (PYW)

Sub-Family K24: USB MCU with Large SRAM Memory Block

Footnotes	Part Number	CPU Frequency	Pin Count	Package	Total Flash Memory	Flash	FlexNVM	EEPROM/FlexRAM	SRAM	UART (Total)	High Baudrate UART w/ISO7816	High Baudrate UART	Enhanced SDHC (bit)	SPI + Chip Selects	I²C	I²S	CAN	Motor Control General Purpose PWM	Quad Decoder General Purpose PWM	FTM External Clk	Low Power Timer	PDB	Total 16-bit ADC DP	Total 16-bit ADC SE	12-bit DAC	Analog Comparator	Analog Comparator Inputs	Vref	MPU	SPFPU	DMA	5 V Tolerant	GPIO (w interrupt)	Evaluation Board (Appendix Page 17)
	MK24FN1M0VDC12	120 MHz	121	XFBGA	1 MB	1 MB	–	–	256 KB	6	1	1	8	6/4/2	3	1	1	2x8ch	2x2ch	2	1	1	4ch	37ch	2	3	6/5/4/0	Y	Y	Y	16ch	Y	83	T11 /F3
	MK24FN1M0VLL12	120 MHz	100	LQFP	1 MB	1 MB	–	–	256 KB	5	1	1	4	6/4/1	3	1	1	2x8ch	2x2ch	2	1	1	4ch	32ch	1	3	5/4/2/0	Y	Y	Y	16ch	Y	66	T11 /F3
	MK24FN1M0VLQ12	120 MHz	144	LQFP	1 MB	1 MB	–	–	256 KB	5	1	1	8	6/4/2	3	1	1	2x8ch	2x2ch	2	1	1	4ch	41ch	2	3	6/5/4/0	Y	Y	Y	16ch	Y	100	T11 /F3

Common Features

Temp Range: -40 C to 105 C
Voltage Range: 1.71–3.6 V
Flash Write Voltage: 1.71 V

Main OSC: 32–40 KHz/8–32 MHz
Debug: JTAG, cJTAG, SWD
RTC (32 KHz OSC, Vbat), 48 MHZ IRC

PIT (32 bit): 1x4ch, Crystal–less USB Enabled (FS Mode ON)
Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP
Serial Programming Interface, CMT (Carrier Module Transmitter)

Hardware Encryption
USB OTG LS/FS (1), USB Device Charge Detect, USB 120 mAReg
Trace: TPIU, FPB, DWT, ITM,ETM, ETB

Kinetis K3x Family of Segment LCD MCUs

The Kinetis K3x MCU family, based on the ARM Cortex-M4 core, is pin, peripheral and software compatible with the K10 MCU family and adds a flexible low-power segment LCD controller with support for up to 320 segments. Devices start from 64 KB of flash in a 64-pin LQFN package extending up to 512 KB in a 144-pin MAPBGA package with a rich suite of analog, communication, timing and control peripherals. For more information about the Kinetis K3x MCU family, **click here**.

Targeted Applications:

Thermostats, smart meters, heart rate monitors, blood gas analyzers

Sub-Family K30: Segment LCD MCU

Footnotes	Part Number	CPU Frequency	Pin Count	Package	Total Flash Memory	Flash	FlexNVM	EEPROM/FlexRAM	SRAM	UART (Total)	High Baudrate UART w/ISO7816	High Baudrate UART	Enhanced SDHC (bit)	Segment LCD	SPI + Chip Selects	I²C	I²S	CAN	Motor Control General Purpose PWM	Quad Decoder General Purpose PWM	FTM External Clk	Low Power Timer	PDB	Total 16-bit ADC DP	Total 16-bit ADC SE	PGA	12-bit DAC	Analog Comparator	Analog Comparator Inputs	MPU	DMA	GPIO (w interrupt)	Evaluation Board (Appendix Page 17)
	MK30DX128VLH7	72 MHz	64	LQFP	160 KB	128 KB	32 KB	2 KB	32 KB	3	1	1	–	16x8/20x4	5/0/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	22ch	2	1	3	3/4/2/0	–	16ch	40	T7
	MK30DX128VLK7	72 MHz	80	LQFP	160 KB	128 KB	32 KB	2 KB	32 KB	4	1	1	–	24x8/28x4	5/3/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	31ch	2	1	3	6/4/2/0	–	16ch	56	T7
	MK30DX128VLL7	72 MHz	100	LQFP	160 KB	128 KB	32 KB	2 KB	32 KB	5	1	1	–	32x8/36x4	6/4/0	2	1	1	1x8ch	2x2ch	2	1	1	4ch	38ch	2	1	3	6/4/2/0	–	16ch	68	T7
	MK30DX128VMC7	72 MHz	121	MAPBGA	160 KB	128 KB	32 KB	2 KB	32 KB	5	1	1	–	36x8/40x4	6/4/0	2	1	1	1x8ch	2x2ch	2	1	1	4ch	38ch	2	1	3	6/4/3/0	–	16ch	72	T7
	MK30DX256VLH7	72 MHz	64	LQFP	288 KB	256 KB	32 KB	2 KB	64 KB	3	1	1	–	16x8/20x4	5/0/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	22ch	2	1	3	3/4/2/0	–	16ch	40	T7
	MK30DX256VLK7	72 MHz	80	LQFP	288 KB	256 KB	32 KB	2 KB	64 KB	4	1	1	–	24x8/28x4	5/3/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	31ch	2	1	3	6/4/2/0	–	16ch	56	T7
	MK30DX256VLL7	72 MHz	100	LQFP	288 KB	256 KB	32 KB	2 KB	64 KB	5	1	1	–	32x8/36x4	6/4/0	2	1	1	1x8ch	2x2ch	2	1	1	4ch	38ch	2	1	3	6/4/2/0	–	16ch	68	T7
	MK30DX256VMC7	72 MHz	121	MAPBGA	288 KB	256 KB	32 KB	2 KB	64 KB	5	1	1	–	36x8/40x4	6/4/0	2	1	1	1x8ch	2x2ch	2	1	1	4ch	38ch	2	1	3	6/4/3/0	–	16ch	72	T7
	MK30DX64VLH7	72 MHz	64	LQFP	96 KB	64 KB	32 KB	2 KB	16 KB	3	1	1	–	16x8/20x4	5/0/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	22ch	2	1	3	3/4/2/0	–	16ch	40	T7
	MK30DX64VLK7	72 MHz	80	LQFP	96 KB	64 KB	32 KB	2 KB	16 KB	4	1	1	–	24x8/28x4	5/3/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	31ch	2	1	3	6/4/2/0	–	16ch	56	T7
	MK30DX64VMC7	72 MHz	121	MAPBGA	96 KB	64 KB	32 KB	2 KB	16 KB	5	1	1	–	36x8/40x4	6/4/0	2	1	1	1x8ch	2x2ch	2	1	1	4ch	38ch	2	1	3	6/4/3/0	–	16ch	72	T7
[1]	MK30DN512VLK10	100 MHz	80	LQFP	512 KB	512 KB	–	–	128 KB	4	1	1	4	24x8/28x4	5/3/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	31ch	2	1	3	6/4/2/0	Y	16ch	56	T7
[1]	MK30DN512VLL10	100 MHz	100	LQFP	512 KB	512 KB	–	–	128 KB	5	1	1	4	32x8/36x4	6/4/1	2	1	2	1x8ch	2x2ch	2	1	1	4ch	38ch	2	1	3	6/4/2/0	Y	16ch	68	T7
[1]	MK30DN512VLQ10	100 MHz	144	LQFP	512 KB	512 KB	–	–	128 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	46ch	2	2	3	6/5/4/0	Y	16ch	102	T7
[1]	MK30DN512VMC10	100 MHz	121	MAPBGA	512 KB	512 KB	–	–	128 KB	6	1	1	8	38x8/42x4	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	42ch	2	2	3	6/4/3/0	Y	16ch	90	T7
[1]	MK30DN512VMD10	100 MHz	144	MAPBGA	512 KB	512 KB	–	–	128 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	46ch	2	2	3	6/5/4/0	Y	16ch	102	T7
[1]	MK30DX128VLQ10	100 MHz	144	LQFP	256 KB	128 KB	128 KB	4 KB	32 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	46ch	2	2	3	6/5/4/0	Y	16ch	102	T7
[1]	MK30DX128VMD10	100 MHz	144	MAPBGA	256 KB	128 KB	128 KB	4 KB	32 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	46ch	2	2	3	6/5/4/0	Y	16ch	102	T7
[1]	MK30DX256VLQ10	100 MHz	144	LQFP	512 KB	256 KB	256 KB	4 KB	64 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	46ch	2	2	3	6/5/4/0	Y	16ch	102	T7
[1]	MK30DX256VMD10	100 MHz	144	MAPBGA	512 KB	256 KB	256 KB	4 KB	64 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	46ch	2	2	3	6/5/4/0	Y	16ch	102	T7

Common Features

Temp Range: -40 C to 105 C
Voltage Range: 1.71–3.6 V
Flash Write Voltage: 1.71 V

Main OSC: 32–40 KHz 3–32 MHz
Debug: JTAG, cJTAG, SWD
RTC (32 KHz OSC, Vbat)

PIT (32 bit): 1x4ch, TSI (Capacitive Touch): 16 input
Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP
Serial Programming Interface, CMT (Carrier Module Transmitter)
5 V Tolerant, V ref, Trace: TPIU, FPB, DWT, ITM

Footnotes

[1] Trace: TPIU, FPB, DWT, ITM, ETM, ETB

Kinetis K4x Family of USB and Segment LCD MCUs

The Kinetis K4x MCU family, based on the ARM Cortex-M4 core, adds full-speed USB 2.0 On-The-Go with device charger detect capability and a flexible, low-power segment LCD controller with support for up to 320 segments. Devices start from 64 KB of flash in a 64-pin LQFN package extending up to 512 KB in a 144-pin MAPBGA package with a rich suite of analog, communication, timing and control peripherals. For more information about the Kinetis K4x MCU family, **click here**.

Targeted Applications:

GPS receivers, blood glucose meters, bike computers, currency counters

Sub-Family K40: Segment LCD MCU with USB

Footnotes	Part Number	CPU Frequency	Pin Count	Package	Total Flash Memory	Flash	FlexNVM	EEPROM/FlexRAM	SRAM	UART (Total)	High Baudrate UART w/ISO7816	High Baudrate UART	Enhanced SDHC (bit)	Segment LCD	SPI + Chip Selects	I²C	I²S	CAN	Motor Control General Purpose PWM	Quad Decoder General Purpose PWM	FTM External Clk	Low Power Timer	PDB	Total 16-bit ADC DP	Total 16-bit ADC SE	PGA	12-bit DAC	Analog Comparator	Analog Comparator Inputs	MPU	DMA	GPIO (w interrupt)	Evaluation Board (Appendix Page 17)
	MK40DX128VLH7	72 MHz	64	LQFP	160 KB	128 KB	32 KB	2 KB	32 KB	3	1	1	–	16x8/20x4	5/0/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	18ch	2	1	3	3/4/2/0	–	16ch	36	T7
	MK40DX128VLK7	72 MHz	80	LQFP	160 KB	128 KB	32 KB	2 KB	32 KB	4	1	1	–	24x8/28x4	5/3/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	27ch	2	1	3	6/4/2/0	–	16ch	52	T7
	MK40DX128VLL7	72 MHz	100	LQFP	160 KB	128 KB	32 KB	2 KB	32 KB	5	1	1	–	32x8/36x4	6/4/0	2	1	1	1x8ch	2x2ch	2	1	1	4ch	34ch	2	1	3	6/4/2/0	–	16ch	64	T7
	MK40DX128VMC7	72 MHz	121	MAPBGA	160 KB	128 KB	32 KB	2 KB	32 KB	5	1	1	–	36x8/40x4	6/4/0	2	1	1	1x8ch	2x2ch	2	1	1	4ch	34ch	2	1	3	6/4/3/0	–	16ch	68	T7
	MK40DX256VLH7	72 MHz	64	LQFP	288 KB	256 KB	32 KB	2 KB	64 KB	3	1	1	–	16x8/20x4	5/0/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	18ch	2	1	3	3/4/2/0	–	16ch	36	T7
	MK40DX256VLK7	72 MHz	80	LQFP	288 KB	256 KB	32 KB	2 KB	64 KB	4	1	1	–	24x8/28x4	5/3/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	27ch	2	1	3	6/4/2/0	–	16ch	52	T7
	MK40DX256VLL7	72 MHz	100	LQFP	288 KB	256 KB	32 KB	2 KB	64 KB	5	1	1	–	32x8/36x4	6/4/0	2	1	1	1x8ch	2x2ch	2	1	1	4ch	34ch	2	1	3	6/4/2/0	–	16ch	64	T7
	MK40DX256VMC7	72 MHz	121	MAPBGA	288 KB	256 KB	32 KB	2 KB	64 KB	5	1	1	–	36x8/40x4	6/4/0	2	1	1	1x8ch	2x2ch	2	1	1	4ch	34ch	2	1	3	6/4/3/0	–	16ch	68	T7
	MK40DX64VLH7	72 MHz	64	LQFP	96 KB	64 KB	32 KB	2 KB	16 KB	3	1	1	–	16x8/20x4	5/0/0	2	1	1	1x8ch	1x2ch	2	1	1	2ch	18ch	2	1	3	3/4/2/0	–	16ch	36	T7
	MK40DX64VLK7	72 MHz	80	LQFP	96 KB	64 KB	32 KB	2 KB	16 KB	4	1	1	–	24x8/28x4	5/3/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	27ch	2	1	3	6/4/2/0	–	16ch	52	T7
	MK40DX64VMC7	72 MHz	121	MAPBGA	96 KB	64 KB	32 KB	2 KB	16 KB	5	1	1	–	36x8/40x4	6/4/0	2	1	1	1x8ch	2x2ch	2	1	1	4ch	34ch	2	1	3	6/4/3/0	–	16ch	68	T7
[1]	MK40DN512VLK10	100 MHz	80	LQFP	512 KB	512 KB	–	–	128 KB	4	1	1	4	24x8/28x4	5/3/0	2	1	1	1x8ch	2x2ch	2	1	1	2ch	27ch	2	1	3	6/4/2/0	Y	16ch	52	T7
[1]	MK40DN512VLL10	100 MHz	100	LQFP	512 KB	512 KB	–	–	128 KB	5	1	1	4	32x8/36x4	6/4/1	2	1	2	1x8ch	2x2ch	2	1	1	4ch	34ch	2	1	3	6/4/2/0	Y	16ch	64	T7
[1]	MK40DN512VLQ10	100 MHz	144	LQFP	512 KB	512 KB	–	–	128 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	42ch	2	2	3	6/5/4/0	Y	16ch	98	T7
[1]	MK40DN512VMC10	100 MHz	121	MAPBGA	512 KB	512 KB	–	–	128 KB	6	1	1	8	38x8/42x4	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	38ch	2	2	3	6/4/3/0	Y	16ch	86	T7
[1]	MK40DN512VMD10	100 MHz	144	MAPBGA	512 KB	512 KB	–	–	128 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	42ch	2	2	3	6/5/4/0	Y	16ch	98	T7
[1]	MK40DX128VLQ10	100 MHz	144	LQFP	256 KB	128 KB	128 KB	4 KB	32 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	42ch	2	2	3	6/5/4/0	Y	16ch	98	T7
[1]	MK40DX128VMD10	100 MHz	144	MAPBGA	256 KB	128 KB	128 KB	4 KB	32 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	42ch	2	2	3	6/5/4/0	Y	16ch	98	T7
[1]	MK40DX256VLQ10	100 MHz	144	LQFP	512 KB	256 KB	256 KB	4 KB	64 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	42ch	2	2	3	6/5/4/0	Y	16ch	98	T7
[1]	MK40DX256VMD10	100 MHz	144	MAPBGA	512 KB	256 KB	256 KB	4 KB	64 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	2	1x8ch	2x2ch	2	1	1	4ch	42ch	2	2	3	6/5/4/0	Y	16ch	98	T7

Common Features

Temp Range: -40 C to 105 C
Voltage Range: 1.71–3.6 V
Flash Write Voltage: 1.71 V

Main OSC: 32–40 KHz/3–32 MHz
Debug: JTAG, cJTAG, SWD
RTC (32 KHz OSC, Vbat)
Trace: TPIU, FPB, DWT, ITM

PIT (32 bit): 1x4ch, TSI (Capacitive Touch): 16 input
Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP
Serial Programming Interface, CMT (Carrier Module Transmitter)
USB OTG LS/FS (1), USB Device Charge Detect, USB 120 mAReg

Footnotes

[1] Trace: TPIU, FPB, DWT, ITM, ETB

Kinetis K5x Family of Measurement MCUs

The Kinetis K5x MCU family, based on the ARM Cortex-M4 core, provides designers with an analog measurement engine consisting of integrated operational and trans-impedance amplifiers as well as high-resolution ADC and DAC modules. The family also features IEEE® 1588 Ethernet and hardware encryption, full-speed USB 2.0 On-The-Go with device charger detect capability and a flexible low-power segment LCD controller with support for up to 320 segments. Devices start from 128 KB of flash in a 64-pin QFN package extending up to 512 KB in a 144-pin MAPBGA package. For more information about the Kinetis K5x MCU family, **click here**.

Targeted Applications:

Low-power portable medical devices, clinical and lab equipment, test/measurement equipment, instrumentation applications, monitor and tele–health applications

Sub-Family K50: High-Precision Analog MCU with USB

Footnotes	Part Number	CPU Frequency	Pin Count	Package	Total Flash Memory	Flash	FlexNVM	EEPROM/FlexRAM	SRAM	UART (Total)	High Baudrate UART w/ISO7816	High Baudrate UART	Enhanced SDHC (bit)	Segment LCD	SPI + Chip Selects	I²C	I²S	CAN	Motor Control General Purpose PWM	Quad Decoder General Purpose PWM	FTM External Clk	Low Power Timer	PDB	Total 16-bit ADC DP	Total 16-bit ADC SE	PGA	12-bit DAC	Analog Comparator	Analog Comparator Inputs	OPAMP	TRIAMP	MPU	DMA	GPIO (w interrupt)	Evaluation Board (Appendix Page 17)
	MK50DX128CLH7	72 MHz	64	LQFP	160 KB	128 KB	32 KB	2 KB	32 KB	3	1	1	–	–	5/0/0	2	1	–	1x8ch	2x2ch	2	1	1	2ch	22ch	1	1	2	6/4/1/0	2	1	–	16ch	35	T8
	MK50DX128CLK7	72 MHz	80	LQFP	160 KB	128 KB	32 KB	2 KB	32 KB	4	1	1	–	–	5/1/0	2	1	–	1x8ch	2x2ch	2	1	1	4ch	30ch	2	1	3	6/5/3/0	2	1	–	16ch	39	T8
	MK50DX128CMC7	72 MHz	121	MAPBGA	160 KB	128 KB	32 KB	2 KB	32 KB	5	1	1	–	–	6/4/0	2	1	–	1x8ch	2x2ch	2	1	1	4ch	36ch	2	1	3	6/5/5/0	2	1	–	16ch	63	T8
	MK50DX256CLK7	72 MHz	80	LQFP	288 KB	256 KB	32 KB	2 KB	64 KB	4	1	1	–	–	5/1/0	2	1	–	1x8ch	2x2ch	2	1	1	4ch	30ch	2	1	3	6/5/3/0	2	1	–	16ch	39	T8
	MK50DX256CLL7	72 MHz	100	LQFP	288 KB	256 KB	32 KB	2 KB	64 KB	5	1	1	–	–	6/3/0	2	1	–	1x8ch	2x2ch	2	1	1	4ch	34ch	2	1	3	6/5/5/0	2	1	–	16ch	59	T8
	MK50DX256CMC7	72 MHz	121	MAPBGA	288 KB	256 KB	32 KB	2 KB	64 KB	5	1	1	–	–	6/4/0	2	1	–	1x8ch	2x2ch	2	1	1	4ch	36ch	2	1	3	6/5/5/0	2	1	–	16ch	63	T8
[1]	MK50DN512CLL10	100 MHz	100	LQFP	512 KB	512 KB	–	–	128 KB	5	1	1	4	–	6/3/1	2	1	–	1x8ch	2x2ch	2	1	1	4ch	34ch	2	2	3	6/5/5/0	2	2	Y	16ch	59	T8
[1]	MK50DN512CLQ10	100 MHz	144	LQFP	512 KB	512 KB	–	–	128 KB	6	1	1	8	–	6/4/2	2	1	–	1x8ch	2x2ch	2	1	1	4ch	41ch	2	2	3	6/5/5/0	2	2	Y	16ch	96	T8
[1]	MK50DN512CMC10	100 MHz	121	MAPBGA	512 KB	512 KB	–	–	128 KB	6	1	1	8	–	6/4/2	2	1	–	1x8ch	2x2ch	2	1	1	4ch	37ch	2	2	3	6/5/5/0	2	2	Y	16ch	78	T8
[1]	MK50DN512CMD10	100 MHz	144	MAPBGA	512 KB	512 KB	–	–	128 KB	6	1	1	8	–	6/4/2	2	1	–	1x8ch	2x2ch	2	1	1	4ch	41ch	2	2	3	6/5/5/0	2	2	Y	16ch	96	T8
[1]	MK50DX256CLK10	100 MHz	80	LQFP	512 KB	256 KB	256 KB	4 KB	64 KB	4	1	1	–	–	5/1/0	2	1	–	1x8ch	2x2ch	2	1	1	4ch	30ch	2	2	3	6/5/3/0	2	2	Y	16ch	39	T8
[1]	MK50DX256CLL10	100 MHz	100	LQFP	512 KB	256 KB	256 KB	4 KB	64 KB	5	1	1	4	–	6/3/1	2	1	–	1x8ch	2x2ch	2	1	1	4ch	34ch	2	2	3	6/5/5/0	2	2	Y	16ch	59	T8
[1]	MK50DX256CMC10	100 MHz	121	MAPBGA	512 KB	256 KB	256 KB	4 KB	64 KB	6	1	1	8	–	6/4/2	2	1	–	1x8ch	2x2ch	2	1	1	4ch	37ch	2	2	3	6/5/5/0	2	2	Y	16ch	78	T8
[1]	MK50DX256CMD10	100 MHz	144	MAPBGA	512 KB	256 KB	256 KB	4 KB	64 KB	6	1	1	8	–	6/4/2	2	1	–	1x8ch	2x2ch	2	1	1	4ch	41ch	2	2	3	6/5/5/0	2	2	Y	16ch	96	T8

Common Features
Temp Range: -40 C to 85 C
Voltage Range: 1.71–3.6 V
Flash Write Voltage: 1.71 V

Main OSC: 32–40 KHz/3–32 MHz
Debug: JTAG, cJTAG, SWD
RTC (32 KHz OSC, Vbat), V ref, 5 V Tolerant
Trace: TPIU, FPB, DWT, ITM

PIT (32 bit): 1x4ch, TSI (Capacitive Touch): 16 input
Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP
Serial Programming Interface, CMT (Carrier Module Transmitter)
USB OTG LS/FS (1), USB Device Charge Detect, USB 120 mAReg

Footnotes
[1] Trace: TPIU, FPB, DWT, ITM, ETM, ETB

Sub-Family K51: High-Precision Analog MCU with Segment LCD and USB

Footnotes	Part Number	CPU Frequency	Pin Count	Package	Total Flash Memory	Flash	FlexNVM	EEPROM/FlexRAM	SRAM	UART (Total)	High Baudrate UART w/ISO7816	High Baudrate UART	Enhanced SDHC (bit)	Segment LCD	SPI + Chip Selects	I²C	I²S	Motor Control General Purpose PWM	Quad Decoder General Purpose PWM	FTM External Clk	Low Power Timer	PDB	Total 16-bit ADC DP	Total 16-bit ADC SE	PGA	12-bit DAC	Analog Comparator	Analog Comparator Inputs	OPAMP	TRIAMP	MPU	DMA	GPIO (w interrupt)	Evaluation Board (Appendix Page 17)
	MK51DX128CLH7	72 MHz	64	LQFP	160 KB	128 KB	32 KB	2 KB	32 KB	3	1	1	–	16x8/20x4	5/0/0	1	1	1x8ch	2x2ch	2	1	1	2ch	18ch	1	1	2	3/4/1/0	2	1	–	16ch	31	T8
	MK51DX128CLK7	72 MHz	80	LQFP	160 KB	128 KB	32 KB	2 KB	32 KB	4	1	1	–	24x8/28x4	5/2/0	2	1	1x8ch	2x2ch	2	1	1	4ch	30ch	2	1	3	6/5/3/0	2	1	–	16ch	39	T8
	MK51DX128CMC7	72 MHz	121	MAPBGA	160 KB	128 KB	32 KB	2 KB	32 KB	5	1	1	–	36x8/40x4	6/4/0	2	1	1x8ch	2x2ch	2	1	1	4ch	35ch	2	1	3	6/5/5/0	2	1	–	16ch	61	T8
	MK51DX256CLK7	72 MHz	80	LQFP	288 KB	256 KB	32 KB	2 KB	64 KB	4	1	1	–	24x8/28x4	5/2/0	2	1	1x8ch	2x2ch	2	1	1	4ch	30ch	2	1	3	6/5/3/0	2	1	–	16ch	39	T8
	MK51DX256CLL7	72 MHz	100	LQFP	288 KB	256 KB	32 KB	2 KB	64 KB	4	1	1	–	32x8/36x4	6/3/0	2	1	1x8ch	2x2ch	2	1	1	4ch	35ch	2	1	3	6/5/5/0	2	1	–	16ch	57	T8
	MK51DX256CMC7	72 MHz	121	MAPBGA	288 KB	256 KB	32 KB	2 KB	64 KB	5	1	1	–	36x8/40x4	6/4/0	2	1	1x8ch	2x2ch	2	1	1	4ch	35ch	2	1	3	6/5/5/0	2	1	–	16ch	61	T8
[1]	MK51DN256CLQ10	100 MHz	144	LQFP	256 KB	256 KB	–	–	64 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	1x8ch	2x2ch	2	1	1	4ch	41ch	2	2	3	6/5/5/0	2	2	Y	16ch	94	T8
[1]	MK51DN256CMD10	100 MHz	144	MAPBGA	256 KB	256 KB	–	–	64 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	1x8ch	2x2ch	2	1	1	4ch	41ch	2	2	3	6/5/5/0	2	2	Y	16ch	94	T8
[1]	MK51DN512CLL10	100 MHz	100	LQFP	512 KB	512 KB	–	–	128 KB	4	1	1	4	32x8/36x4	6/3/1	2	1	1x8ch	2x2ch	2	1	1	4ch	35ch	2	2	3	6/5/5/0	2	2	Y	16ch	57	T8
[1]	MK51DN512CLQ10	100 MHz	144	LQFP	512 KB	512 KB	–	–	128 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	1x8ch	2x2ch	2	1	1	4ch	41ch	2	2	3	6/5/5/0	2	2	Y	16ch	94	T8
[1]	MK51DN512CMC10	100 MHz	121	MAPBGA	512 KB	512 KB	–	–	128 KB	6	1	1	8	38x8/42x4	6/4/2	2	1	1x8ch	2x2ch	2	1	1	4ch	37ch	2	2	3	6/5/5/0	2	2	Y	16ch	78	T8
[1]	MK51DN512CMD10	100 MHz	144	MAPBGA	512 KB	512 KB	–	–	128 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	1x8ch	2x2ch	2	1	1	4ch	41ch	2	2	3	6/5/5/0	2	2	Y	16ch	94	T8
[1]	MK51DX256CLK10	100 MHz	80	LQFP	512 KB	256 KB	256 KB	4 KB	64 KB	4	1	1	–	24x8/28x4	5/2/0	2	1	1x8ch	2x2ch	2	1	1	4ch	30ch	2	2	3	6/5/3/0	2	2	Y	16ch	39	T8
[1]	MK51DX256CLL10	100 MHz	100	LQFP	512 KB	256 KB	256 KB	4 KB	64 KB	4	1	1	4	32x8/36x4	6/3/1	2	1	1x8ch	2x2ch	2	1	1	4ch	35ch	2	2	3	6/5/5/0	2	2	Y	16ch	57	T8
[1]	MK51DX256CMC10	100 MHz	121	MAPBGA	512 KB	256 KB	256 KB	4 KB	64 KB	6	1	1	8	38x8/42x4	6/4/2	2	1	1x8ch	2x2ch	2	1	1	4ch	37ch	2	2	3	6/5/5/0	2	2	Y	16ch	78	T8

Common Features
Temp Range: -40 C to 85 C
Voltage Range: 1.71–3.6 V
Flash Write Voltage: 1.71 V

Main OSC: 32–40 KHz/3–32 MHz
Debug: JTAG, cJTAG, SWD
RTC (32 KHz OSC, Vbat), V ref, 5 V Tolerant
Trace: TPIU, FPB, DWT, ITM

PIT (32 bit): 1x4ch, TSI (Capacitive Touch): 16 input
Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP
Serial Programming Interface, CMT (Carrier Module Transmitter)
USB OTG LS/FS (1), USB Device Charge Detect, USB 120 mAReg

Footnotes
[1] Trace: TPIU, FPB, DWT, ITM, ETM, ETB

Sub-Family K52: High-Precision Analog MCU with USB and Ethernet

Footnotes	Part Number	CPU Frequency	Pin Count	Package	Total Flash Memory	Flash	FlexNVM	EEPROM/FlexRAM	SRAM	UART (Total)	High Baudrate UART w/ISO7816	High Baudrate UART	Enhanced SDHC (bit)	SPI + Chip Selects	I²C	I²S	Ethernet w/1588	IEEE 1588 Timer (CLKIN)	Motor Control General Purpose PWM	Quad Decoder General Purpose PWM	FTM External Clk	Low Power Timer	PDB	Total 16-bit ADC DP	Total 16-bit ADC SE	PGA	12-bit DAC	Analog Comparator	Analog Comparator Inputs	OPAMP	TRIAMP	MPU	DMA	GPIO (w interrupt)	Evaluation Board (Appendix Page 17)
	MK52DN512CLQ10	100 MHz	144	LQFP	512 KB	512 KB	–	–	128 KB	6	1	1	8	6/4/2	2	1	MII/RMII	1x4ch	1x8ch	2x2ch	2	1	1	4ch	41ch	2	2	3	6/5/5/0	2	2	Y	16ch	96	T8
	MK52DN512CMD10	100 MHz	144	MAPBGA	512 KB	512 KB	–	–	128 KB	6	1	1	8	6/4/2	2	1	MII/RMII	1x4ch	1x8ch	2x2ch	2	1	1	4ch	41ch	2	2	3	6/5/5/0	2	2	Y	16ch	96	T8

Common Features
Temp Range: -40 C to 85 C
Voltage Range: 1.71–3.6 V
Flash Write Voltage: 1.71 V

Main OSC: 32–40 KHz/3–32 MHz
Debug: JTAG, cJTAG, SWD
RTC (32 KHz OSC, Vbat), V ref, 5 V Tolerant

PIT (32 bit): 1x4ch, TSI (Capacitive Touch): 16 input
Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP
Serial Programming Interface, CMT (Carrier Module Transmitter)

Hardware Encryption
USB OTG LS/FS (1), USB Device Charge Detect, USB 120 mAReg
Trace: TPIU, FPB, DWT, ITM, ETM, ETB

Sub-Family K53: High-Precision Analog MCU with USB, Segment LCD and Ethernet

Footnotes	Part Number	CPU Frequency	Pin Count	Package	Total Flash Memory	Flash	FlexNVM	EEPROM/FlexRAM	SRAM	UART (Total)	High Baudrate UART w/ISO7816	High Baudrate UART	Enhanced SDHC (bit)	Ethernet w/1588	SPI + Chip Selects	I²C	I²S	Ethernet w/1588	IEEE 1588 Timer (CLKIN)	Motor Control General Purpose PWM	Quad Decoder General Purpose PWM	FTM External Clk	Low Power Timer	PDB	Total 16-bit ADC DP	Total 16-bit ADC SE	PGA	12-bit DAC	Analog Comparator	Analog Comparator Inputs	OPAMP	TRIAMP	DMA	GPIO (w interrupt)	Evaluation Board (Appendix Page 17)
	MK53DN512CLQ10	100 MHz	144	LQFP	512 KB	512 KB	–	–	128 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	MII/RMII	1x4ch	1x8ch	2x2ch	2	1	1	4ch	41ch	2	2	3	6/5/5/0	2	2	16ch	94	T8
	MK53DN512CMD10	100 MHz	144	MAPBGA	512 KB	512 KB	–	–	128 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	MII/RMII	1x4ch	1x8ch	2x2ch	2	1	1	4ch	41ch	2	2	3	6/5/5/0	2	2	16ch	94	T8
	MK53DX256CLQ10	100 MHz	144	LQFP	512 KB	256 KB	256 KB	4 KB	64 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	MII/RMII	1x4ch	1x8ch	2x2ch	2	1	1	4ch	41ch	2	2	3	6/5/5/0	2	2	16ch	94	T8
	MK53DX256CMD10	100 MHz	144	MAPBGA	512 KB	256 KB	256 KB	4 KB	64 KB	6	1	1	8	40x8/44x4	6/4/2	2	1	MII/RMII	1x4ch	1x8ch	2x2ch	2	1	1	4ch	41ch	2	2	3	6/5/5/0	2	2	16ch	94	T8

Common Features
Temp Range: -40 C to 85 C
Voltage Range: 1.71–3.6 V
Flash Write Voltage: 1.71 V

Main OSC: 32–40 KHz/3–32 MHz
Debug: JTAG, cJTAG, SWD
RTC (32 KHz OSC, Vbat), V ref, 5 V Tolerant

PIT (32 bit): 1x4ch, TSI (Capacitive Touch): 16 input
Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP
Serial Programming Interface, CMT (Carrier Module Transmitter)

Ethernet w/1588:
Hardware Encryption, MPU
USB OTG LS/FS (1), USB Device Charge Detect, USB 120 mAReg
Trace: TPIU, FPB, DWT, ITM, ETM, ETB

Kinetis K6x Family of Ethernet MCUs

The Kinetis K6x MCU family, based on the ARM Cortex-M4 core, are pin, peripheral and software compatible with many of the Kinetis K series MCU families, offering IEEE 1588 Ethernet and full- and optional high-speed USB 2.0 On-The-Go, including options with USB crystal-less functionality. Devices start from 256 KB of flash in a 100-pin QFP package extending up to 1 MB of flash and 256 KB of SRAM in a 256-pin MAPBGA package. These devices offer various levels of integration, with a rich suite of analog, communication, timing and control peripherals. Next-generation Kinetis K6x MCUs are further optimized for performance and power consumption, offering more streamlined integration for further BOM cost reductions. For more information about the Kinetis K6x MCU family, **click here**.

Targeted Applications:

Building control, factory automation, industrial drivers, IoT data concentrators, medical monitoring

Sub-Family K60: Ethernet MCU with Mixed-Signal Integration

Footnotes	Part Number	CPU Frequency	Pin Count	Package	Total Flash Memory	Flash	FlexNVM	EEPROM/FlexRAM	SRAM	UART (Total)	High Baudrate UART w/ISO7816	High Baudrate UART	Enhanced SDHC (bit)	SPI + Chip Selects	I²C	I²S	CAN	Ethernet w/1588	IEEE 1588 Timer (CLKIN)	Motor Control General Purpose PWM	Quad Decoder General Purpose PWM	FTM External Clk	Low Power Timer	PDB	Total 16-bit ADC DP	Total 16-bit ADC SE	PGA	12-bit DAC	Analog Comparator	Analog Comparator Inputs	Cache	DMA	GPIO (w interrupt)	Evaluation Board (Appendix Page 17)
	MK60DN256VLL10	100 MHz	100	LQFP	256 KB	256 KB	–	–	64 KB	5	1	1	4	6/4/1	2	1	2	RMII	1x3ch	1x8ch	2x2ch	2	1	1	4ch	33ch	2	1	3	6/5/5/0	–	16ch	66	T9
	MK60DN256VLQ10	100 MHz	144	LQFP	256 KB	256 KB	–	–	64 KB	6	1	1	8	6/4/2	2	1	2	MII/RMII	1x4ch	1x8ch	2x2ch	2	1	1	4ch	42ch	2	2	3	6/5/4/0	–	16ch	100	T9
	MK60DN256VMC10	100 MHz	121	MAPBGA	256 KB	256 KB	–	–	64 KB	6	1	1	8	6/4/2	2	1	2	RMII	1x4ch	1x8ch	2x2ch	2	1	1	4ch	38ch	2	2	3	6/4/3/0	–	16ch	86	T9
	MK60DN256VMD10	100 MHz	144	MAPBGA	256 KB	256 KB	–	–	64 KB	6	1	1	8	6/4/2	2	1	2	MII/RMII	1x4ch	1x8ch	2x2ch	2	1	1	4ch	42ch	2	2	3	6/5/4/0	–	16ch	100	T9
	MK60DN512VLL10	100 MHz	100	LQFP	512 KB	512 KB	–	–	128 KB	5	1	1	4	6/4/1	2	1	2	RMII	1x3ch	1x8ch	2x2ch	2	1	1	4ch	33ch	2	1	3	6/5/5/0	–	16ch	66	T9
	MK60DN512VLQ10	100 MHz	144	LQFP	512 KB	512 KB	–	–	128 KB	6	1	1	8	6/4/2	2	1	2	MII/RMII	1x4ch	1x8ch	2x2ch	2	1	1	4ch	42ch	2	2	3	6/5/4/0	–	16ch	100	T9
	MK60DN512VMC10	100 MHz	121	MAPBGA	512 KB	512 KB	–	–	128 KB	6	1	1	8	6/4/2	2	1	2	RMII	1x4ch	1x8ch	2x2ch	2	1	1	4ch	38ch	2	2	3	6/4/3/0	–	16ch	86	T9
	MK60DN512VMD10	100 MHz	144	MAPBGA	512 KB	512 KB	–	–	128 KB	6	1	1	8	6/4/2	2	1	2	MII/RMII	1x4ch	1x8ch	2x2ch	2	1	1	4ch	42ch	2	2	3	6/5/4/0	–	16ch	100	T9
[1]	MK60DN512ZCAB10R	100 MHz	120	WLCSP	512 KB	512 KB	–	–	128 KB	6	1	1	4	6/4/1	2	1	2	RMII	1x4ch	1x8ch	2x2ch	2	1	1	4ch	38ch	2	2	3	6/5/3/0	–	16ch	79	T9
	MK60DX256VLL10	100 MHz	100	LQFP	512 KB	256 KB	256 KB	4 KB	64 KB	5	1	1	4	6/4/1	2	1	2	RMII	1x3ch	1x8ch	2x2ch	2	1	1	4ch	33ch	2	1	3	6/5/5/0	–	16ch	66	T9
	MK60DX256VLQ10	100 MHz	144	LQFP	512 KB	256 KB	256 KB	4 KB	64 KB	6	1	1	8	6/4/2	2	1	2	MII/RMII	1x4ch	1x8ch	2x2ch	2	1	1	4ch	42ch	2	2	3	6/5/4/0	–	16ch	100	T9
	MK60DX256VMC10	100 MHz	121	MAPBGA	512 KB	256 KB	256 KB	4 KB	64 KB	6	1	1	8	6/4/2	2	1	2	RMII	1x4ch	1x8ch	2x2ch	2	1	1	4ch	38ch	2	2	3	6/4/3/0	–	16ch	86	T9
	MK60DX256VMD10	100 MHz	144	MAPBGA	512 KB	256 KB	256 KB	4 KB	64 KB	6	1	1	8	6/4/2	2	1	2	MII/RMII	1x4ch	1x8ch	2x2ch	2	1	1	4ch	42ch	2	2	3	6/5/4/0	–	16ch	100	T9
[2]	MK60FN1M0VLQ12	120 MHz	144	LQFP	1 MB	1 MB	–	–	128 KB	6	2	0	8	6/4/2	2	2	2	MII/RMII	1x4ch	2x8ch	2x2ch	2	1	1	4ch	58ch	4	2	4	5/2/2/5	16 KB	32ch	100	T10
[2]	MK60FN1M0VMD12	120 MHz	144	MAPBGA	1 MB	1 MB	–	–	128 KB	6	2	0	8	6/4/2	2	2	2	MII/RMII	1x4ch	2x8ch	2x2ch	2	1	1	4ch	58ch	4	2	4	5/2/2/5	16 KB	32ch	100	T10
[2]	MK60FX512VLQ12	120 MHz	144	LQFP	1 MB	512 KB	512 KB	16 KB	128 KB	6	2	0	8	6/4/2	2	2	2	MII/RMII	1x4ch	2x8ch	2x2ch	2	1	1	4ch	58ch	4	2	4	5/2/2/5	16 KB	32ch	100	T10
[2]	MK60FX512VMD12	120 MHz	144	MAPBGA	1 MB	512 KB	512 KB	16 KB	128 KB	6	2	0	8	6/4/2	2	2	2	MII/RMII	1x4ch	2x8ch	2x2ch	2	1	1	4ch	58ch	4	2	4	5/2/2/5	16 KB	32ch	100	T10
[2]	MK60FN1M0VLQ15	150 MHz	144	LQFP	1 MB	1 MB	–	–	128 KB	6	2	0	8	6/4/2	2	2	2	MII/RMII	1x4ch	2x8ch	2x2ch	2	1	1	4ch	58ch	4	2	4	5/2/2/5	16 KB	32ch	100	T10
[2]	MK60FN1M0VMD15	150 MHz	144	MAPBGA	1 MB	1 MB	–	–	128 KB	6	2	0	8	6/4/2	2	2	2	MII/RMII	1x4ch	2x8ch	2x2ch	2	1	1	4ch	58ch	4	2	4	5/2/2/5	16 KB	32ch	100	T10
[2]	MK60FX512VLQ15	150 MHz	144	LQFP	1 MB	512 KB	512 KB	16 KB	128 KB	6	2	0	8	6/4/2	2	2	2	MII/RMII	1x4ch	2x8ch	2x2ch	2	1	1	4ch	58ch	4	2	4	5/2/2/5	16 KB	32ch	100	T10
[2]	MK60FX512VMD15	150 MHz	144	MAPBGA	1 MB	512 KB	512 KB	16 KB	128 KB	6	2	0	8	6/4/2	2	2	2	MII/RMII	1x4ch	2x8ch	2x2ch	2	1	1	4ch	58ch	4	2	4	5/2/2/5	16 KB	32ch	100	T10

Common Features

Temp Range: -40 C to 105 C
Voltage Range: 1.71–3.6 V
Flash Write Voltage: 1.71 V
Trace: TPIU, FPB, DWT, ITM, ETM, ETB

Main OSC: 32–40 KHz/3–32 MHz
Debug: JTAG, cJTAG, SWD
RTC (32 KHz OSC, Vbat), V ref, MPU
Hardware Encryption, 5 V Tolerant

PIT (32 bit): 1x4ch, TSI (Capacitive Touch): 16 input
Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP
Serial Programming Interface, CMT (Carrier Module Transmitter)
USB Device Charge Detect, USB 120 mAReg, USB OTG LS/FS (1)

Footnotes

[1] Temp Range: -40 C to 85 C
[2] Secondary OSC: 32–40 KHz/8–32 MHz, [2]SPFPU
[2] NAND Flash Controller, [2]USB OTG LS/FS/HS (1)
[2] Main OSC: 32–40 KHz/8–32 MHz

Sub-Family K61: Ethernet MCU with Anti-Tamper/DryICE Solutions

Footnotes	Part Number	CPU Frequency	Pin Count	Package	Total Flash Memory	Flash	FlexNVM	EEPROM/FlexRAM	SRAM	UART (Total)	High Baudrate UART w/ISO7816	DDR Controller	Enhanced SDHC (bit)	SPI + Chip Selects	I²C	I²S	CAN	Ethernet w/1588	IEEE 1588 Timer (CLKIN)	Motor Control General Purpose PWM	Quad Decoder General Purpose PWM	FTM External Clk	Low Power Timer	PDB	Total 16-bit ADC DP	Total 16-bit ADC SE	PGA	12-bit DAC	Analog Comparator	Analog Comparator Inputs	Cache	DMA	GPIO (w interrupt)	Evaluation Board (Appendix Page 17)
[1]	MK61FN1M0CAA12R	120 MHz	143	WLCSP	1 MB	1 MB	–	–	128 KB	6	2	–	4	6/4/1	2	2	2	RMI	1x4ch	2x8ch	2x2ch	2	1	1	4ch	45ch	4	2	4	5/1/2/5	16 KB	32ch	79	T10
[2]	MK61FN1M0VMD12	120 MHz	144	MAPBGA	1 MB	1 MB	–	–	128 KB	6	2	–	8	6/4/2	2	2	2	MII/RMII	1x4ch	2x8ch	2x2ch	2	1	1	4ch	53ch	4	2	4	5/2/2/5	16 KB	32ch	95	T10
[2]	MK61FN1M0VMJ12	120 MHz	256	MAPBGA	1 MB	1 MB	–	–	128 KB	6	2	Y	8	6/4/2	2	2	2	MII/RMII	1x4ch	2x8ch	2x2ch	2	1	1	4ch	77ch	4	2	4	5/2/2/5	16 KB	32ch	128	T10
[2]	MK61FX512VMD12	120 MHz	144	MAPBGA	1 MB	512 KB	512 KB	16 KB	128 KB	6	2	–	8	6/4/2	2	2	2	MII/RMII	1x4ch	2x8ch	2x2ch	2	1	1	4ch	53ch	4	2	4	5/2/2/5	16 KB	32ch	95	T10
[2]	MK61FX512VMJ12	120 MHz	256	MAPBGA	1 MB	512 KB	512 KB	16 KB	128 KB	6	2	Y	8	6/4/2	2	2	2	MII/RMII	1x4ch	2x8ch	2x2ch	2	1	1	4ch	77ch	4	2	4	5/2/2/5	16 KB	32ch	128	T10
[2]	MK61FN1M0VMD15	150 MHz	144	MAPBGA	1 MB	1 MB	–	–	128 KB	6	2	–	8	6/4/2	2	2	2	MII/RMII	1x4ch	2x8ch	2x2ch	2	1	1	4ch	53ch	4	2	4	5/2/2/5	16 KB	32ch	95	T10
[2]	MK61FN1M0VMJ15	150 MHz	256	MAPBGA	1 MB	1 MB	–	–	128 KB	6	2	Y	8	6/4/2	2	2	2	MII/RMII	1x4ch	2x8ch	2x2ch	2	1	1	4ch	77ch	4	2	4	5/2/2/5	16 KB	32ch	128	T10
[2]	MK61FX512VMD15	150 MHz	144	MAPBGA	1 MB	512 KB	512 KB	16 KB	128 KB	6	2	–	8	6/4/2	2	2	2	MII/RMII	1x4ch	2x8ch	2x2ch	2	1	1	4ch	53ch	4	2	4	5/2/2/5	16 KB	32ch	95	T10
[2]	MK61FX512VMJ15	150 MHz	256	MAPBGA	1 MB	512 KB	512 KB	16 KB	128 KB	6	2	Y	8	6/4/2	2	2	2	MII/RMII	1x4ch	2x8ch	2x2ch	2	1	1	4ch	77ch	4	2	4	5/2/2/5	16 KB	32ch	128	T10

Common Features

Temp Range: -40 C to 105 C
Voltage Range: 1.71–3.6 V
Flash Write Voltage: 1.71 V
Debug: JTAG, cJTAG, SWD; Trace: TPIU, FPB, DWT, ITM, ETM, ETB

Main OSC: 32–40 KHz/8–32 MHz
Secondary OSC: 32–40 KHz/8–32 MHz
Debug: JTAG, cJTAG, SWD
RTC (32 KHz OSC, Vbat), V ref, SPFPU, MPU
USB Device Charge Detect, USB 120 mAReg, USB OTG LS/FS (1)

PIT (32 bit): 1x4ch, TSI (Capacitive Touch): 16 input
Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP
Serial Programming Interface, CMT (Carrier Module Transmitter)
Hardware Encryption, Tamper Detect, 5 V Tolerant

Footnotes

[1] Temp Range: -40 C to 85 C
[2] NAND Flash Controller, [2] USB OTG LS/FS/HS (1)

Sub-Family K63: Ethernet MCU with Large SRAM Memory Block and Anti-Tamper/DryICE Solutions

Footnotes	Part Number	CPU Frequency	Pin Count	Package	Total Flash Memory	Flash	FlexNVM	EEPROM/FlexRAM	SRAM	UART (Total)	High Baudrate UART w/ISO7816	High Baudrate UART	Enhanced SDHC (bit)	SPI + Chip Selects	I²C	I²S	CAN	Ethernet w/1588	IEEE 1588 Timer (CLKIN)	Motor Control General Purpose PWM	Quad Decoder General Purpose PWM	FTM External Clk	Low Power Timer	PDB	Total 16-bit ADC DP	Total 16-bit ADC SE	PGA	12-bit DAC	Analog Comparator	Analog Comparator Inputs	Cache	DMA	GPIO (w interrupt)	Evaluation Board (Appendix Page 17)
	MK63FN1M0VLQ12	120 MHz	144	LQFP	1 MB	1 MB	–	–	256 KB	6	1	1	8	6/4/2	3	1	1	MII/RMII	1x4ch	2x8ch	2x2ch	2	1	1	4ch	41ch	–	2	3	4/3/3/0	Y	16ch	100	T11
	MK63FN1M0VMD12	120 MHz	144	MAPBGA	1 MB	1 MB	–	–	256 KB	6	1	1	8	6/4/2	3	1	1	MII/RMII	1x4ch	2x8ch	2x2ch	2	1	1	4ch	41ch	–	2	3	6/5/4/0	–	16ch	95	T11

Common Features

Temp Range: -40 C to 105 C
Voltage Range: 1.71–3.6 V
Flash Write Voltage: 1.71 V

Main OSC: 32–40 KHz/8–32 MHz
Debug: JTAG, cJTAG, SWD, 48 MHz IRC
RTC (32 KHz OSC, Vbat), 5 V Tolerant

PIT (32 bit): 1x4ch, Crystal–less USB Enabled (FS Mode only)
Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP
Serial Programming Interface, CMT (Carrier Module Transmitter)

Hardware Encryption, Tamper Detect
USB Device Charge Detect, USB 120 mAReg,
USB OTG LS/FS (1), SPFPU, MPU
Trace: TPIU, FPB, DWT, ITM, ETM, ETB

Sub-Family K64: Ethernet MCU with Large SRAM Memory Block

Footnotes	Part Number	CPU Frequency	Pin Count	Package	Total Flash Memory	Flash	FlexNVM	EEPROM/FlexRAM	SRAM	UART (Total)	High Baudrate UART w/ISO7816	High Baudrate UART	Enhanced SDHC (bit)	SPI + Chip Selects	I²C	I²S	CAN	Ethernet w/1588	IEEE 1588 Timer (CLKIN)	Motor Control General Purpose PWM	Quad Decoder General Purpose PWM	FTM External Clk	Low Power Timer	PDB	Total 16-bit ADC DP	Total 16-bit ADC SE	PGA	12-bit DAC	Analog Comparator	Analog Comparator Inputs	DMA	GPIO (w interrupt)	Evaluation Board (Appendix Page 17)
	MK64FN1M0VDC12	120 MHz	121	XFBGA	1 MB	1 MB	–	–	256 KB	6	1	1	8	6/4/2	3	1	1	RMII	1x3ch	2x8ch	2x2ch	2	1	1	4ch	37ch	–	2	3	6/5/4/0	16ch	83	T11/F3
	MK64FN1M0VLL12	120 MHz	100	LQFP	1 MB	1 MB	–	–	256 KB	5	1	1	4	6/4/1	3	1	1	RMII	1x2ch	2x8ch	2x2ch	2	1	1	4ch	32ch	–	1	3	5/4/2/0	16ch	66	T11/F3
	MK64FN1M0VLQ12	120 MHz	144	LQFP	1 MB	1 MB	–	–	256 KB	6	1	1	8	6/4/2	3	1	1	MII/RMII	1x4ch	2x8ch	2x2ch	2	1	1	4ch	41ch	–	2	3	6/5/4/0	16ch	100	T11/F3
	MK64FN1M0VMD12	120 MHz	144	MAPBGA	1 MB	1 MB	–	–	256 KB	6	1	1	8	6/4/2	3	1	1	MII/RMII	1x4ch	2x8ch	2x2ch	2	1	1	4ch	41ch	–	2	3	6/5/4/0	16ch	100	T11/F3
	MK64FX512VDC12	120 MHz	121	XFBGA	640 KB	512 KB	128 KB	4 KB	192 KB	6	1	1	8	6/4/2	3	1	1	RMII	1x3ch	2x8ch	2x2ch	2	1	1	4ch	37ch	–	2	3	6/5/4/0	16ch	86	T11/F3
	MK64FX512VLL12	120 MHz	100	LQFP	640 KB	512 KB	128 KB	4 KB	192 KB	5	1	1	4	6/4/1	3	1	1	RMII	1x2ch	2x8ch	2x2ch	2	1	1	4ch	32ch	–	1	3	5/4/2/0	16ch	66	T11/F3
	MK64FX512VLQ12	120 MHz	144	LQFP	640 KB	512 KB	128 KB	4 KB	192 KB	6	1	1	8	6/4/2	3	1	1	MII/RMII	1x4ch	2x8ch	2x2ch	2	1	1	4ch	41ch	–	2	3	6/5/4/0	16ch	100	T11/F3
	MK64FX512VMD12	120 MHz	144	MAPBGA	640 KB	512 KB	128 KB	4 KB	192 KB	6	1	1	8	6/4/2	3	1	1	MII/RMII	1x4ch	2x8ch	2x2ch	2	1	1	4ch	41ch	–	2	3	6/5/4/0	16ch	100	T11/F3

Common Features

Temp Range: -40 C to 105 C
Voltage Range: 1.71–3.6 V

Main OSC: 32–40 KHz/8–32 MHz
Debug: JTAG, cJTAG, SWD, 48 MHz IRC

PIT (32 bit): 1x4ch, Crystal–less USB Enabled (FS Mode only)
Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP

Hardware Encryption, Tamper Detect
USB Device Charge Detect, USB 120 mAReg,
USB OTG LS/FS (1)

Kinetis K7x Family of Graphic LCD MCUs

The Kinetis K7x MCU family, based on the ARM Cortex-M4 core, includes an integrated graphics LCD controller, IEEE 1588 Ethernet MAC, full- and high-speed USB 2.0 On-The-Go with device charger detect capability, hardware encryption and tamper detection capabilities. The K70 MCU is available with 512 KB or 1 MB of flash in a 256-pin MBGA package. Each MCU includes a rich suite of analog, communication, timing and control peripherals. All K70 MCUs include a single precision floating point unit and NAND flash controller. 256-pin versions include an on-chip DRAM controller for system expansion. For more information about the Kinetis K7x MCU family, **click here**.

Targeted Applications:

Industrial control panels, navigational displays, electronic point-of-sales (EPOS) terminals, medical monitoring equipment

Sub-Family K70: Graphics MCU with HS USB, Ethernet, DDR Controller and Anti-Tamper/DryICE Solutions

Footnotes	Part Number	CPU Frequency	Pin Count	Package	Total Flash Memory	Flash	FlexNVM	EEPROM/FlexRAM	SRAM	UART (Total)	High Baudrate UART w/ISO7816	Enhanced SDHC (bit)	Graphic LCD	SPI + Chip Selects	I²C	I²S	CAN	Ethernet w/1588	IEEE 1588 Timer (CLKIN)	Motor Control General Purpose PWM	Quad Decoder General Purpose PWM	FTM External Clk	Low Power Timer	PDB	Total 16-bit ADC DP	Total 16-bit ADC SE	PGA	12-bit DAC	Analog Comparator	Analog Comparator Inputs	Cache	DMA	GPIO (w interrupt)	Evaluation Board (Appendix Page 17)
	MK70FN1M0VMJ12	120 MHz	256	MAPBGA	1 MB	1 MB	–	–	128 KB	6	2	8	800x600	6/4/2	2	2	2	MII/RMII	1x4ch	2x8ch	2x2ch	2	1	1	4ch	77ch	4	2	4	5/2/2/5	16 KB	32ch	128	T13
	MK70FX512VMJ12	120 MHz	256	MAPBGA	1 MB	512 KB	512 KB	16 KB	128 KB	6	2	8	800x600	6/4/2	2	2	2	MII/RMII	1x4ch	2x8ch	2x2ch	2	1	1	4ch	77ch	4	2	4	5/2/2/5	16 KB	32ch	128	T13
	MK70FN1M0VMJ15	150 MHz	256	MAPBGA	1 MB	1 MB	–	–	128 KB	6	2	8	800x600	6/4/2	2	2	2	MII/RMII	1x4ch	2x8ch	2x2ch	2	1	1	4ch	77ch	4	2	4	5/2/2/5	16 KB	32ch	128	T13
	MK70FX512VMJ15	150 MHz	256	MAPBGA	1 MB	512 KB	512 KB	16 KB	128 KB	6	2	8	800x600	6/4/2	2	2	2	MII/RMII	1x4ch	2x8ch	2x2ch	2	1	1	4ch	77ch	4	2	4	5/2/2/5	16 KB	32ch	128	T13

Common Features

Temp Range: -40 C to 105 C
Voltage Range: 1.71–3.6 V
Flash Write Voltage: 1.71 V
Trace: TPIU, FPB, DWT, ITM, ETM, ETB

Main OSC: 32–40 KHz/8–32 MHz
Debug: JTAG, cJTAG, SWD
RTC (32 KHz OSC, Vbat), 5 V Tolerant
Secondary OSC: 32–40 KHz/8–32 MHz

PIT (32 bit): 1x4ch, TSI (Capacitive Touch): 16 input
Hardware Watchdog, Software Watchdog, PMC, MCG, NMI, CRC, DSP
Serial Programming Interface, CMT (Carrier Module Transmitter)
SPFPU, V ref, MPU

Hardware Encryption, Tamper Detect
DDR Controller, NAND Flash Controller
USB Device Charge Detect, USB 120 mAReg
USB OTG LS/FS (1), USB OTG LS/FS/HS (1)

Evaluation Hardware Support for Kinetis MCUs

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The **Freescale Freedom development platform** is a small, low-power, cost-effective evaluation and development system perfect for quick application prototyping and demonstration. The Freescale Freedom platform is compatible with the Arduino™ standard enabling usage of a rich-set of third-party expansion boards. Many Freescale Freedom development platforms are also mbed™ enabled.

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T1	**TWR–K20D50M**	Kinetis K20 50 MHz Tower System Module
F1	**FRDM–K20D50M**	Kinetis K20 50 MHz Freescale Freedom Development Platform
T2	**TWR–K20D72M**	Kinetis K20 72 MHz MCU Tower System Module
T3	**TWR–K21D50M**	Kinetis K21 50 MHz MCU Tower System Module
T4	**TWR–K21F120M**	Kinetis K21 120 MHz Tower System Module
T5	**TWR–K22F120M**	Kinetis K22 120 MHz Tower System Module
F2	**FRDM–K22F**	Kinetis K22 Freescale Freedom Development Platform
T7	**TWR–K40D100M**	Kinetis K40 100 MHz Tower System Module
T8	**TWR–K53N512**	Kinetis K53 Tower System Module
T9	**TWR–K60D100M**	Kinetis K60 100 MHz MCU Tower System Module
T10	**TWR–K60F120M**	Kinetis K60 120 MHz Tower System Module
T11	**TWR–K64F120M**	Kinetis K64 120 MHz Tower System Module
F3	**FRDM–K64F**	Kinetis K64 Freescale Freedom Development Platform
T13	**TWR–K70F120M**	Kinetis K70 120 MHz Tower System Module

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