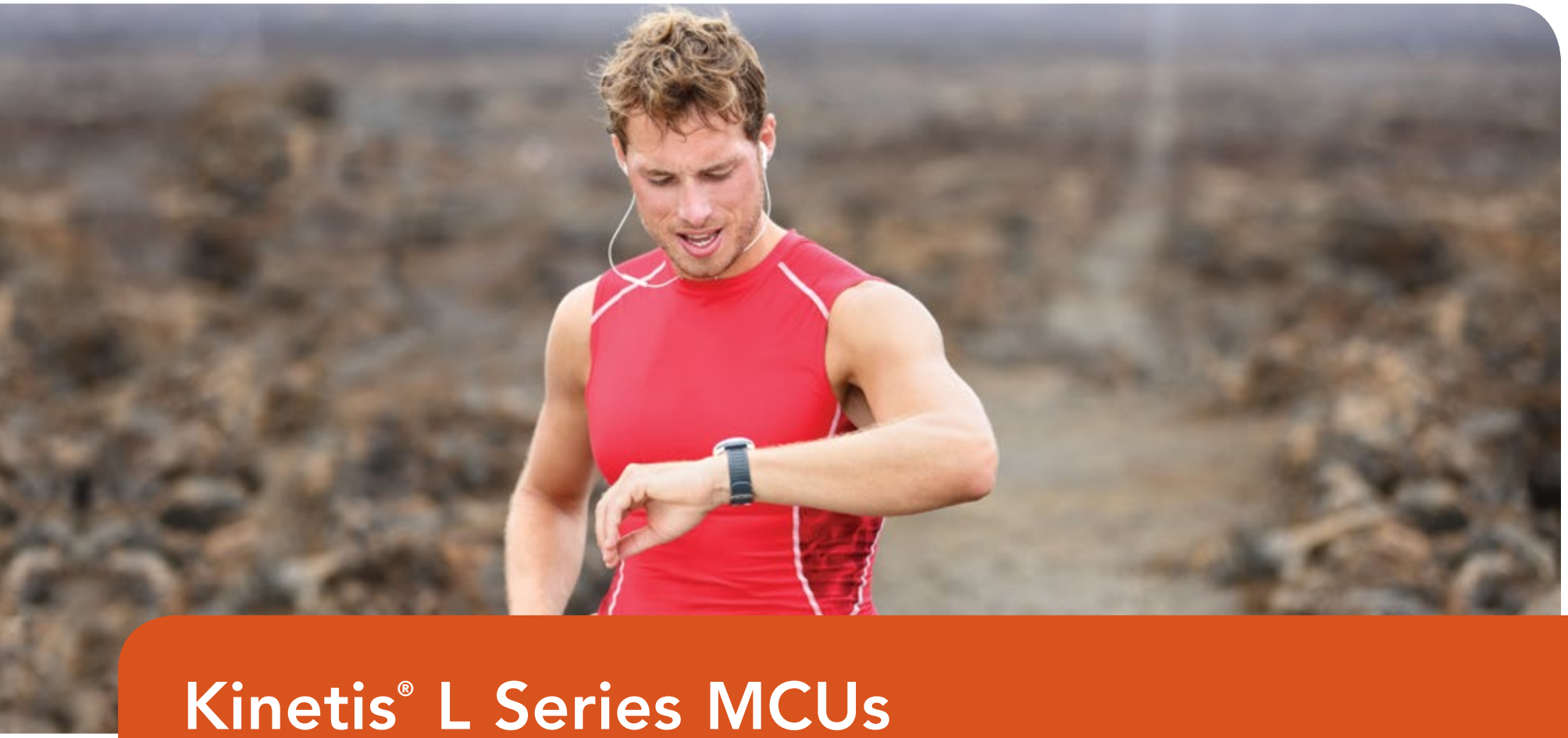

Kinetis® L Series MCUs

Selector Guide

An Ultra-Low-Power Series
Based on Arm® Cortex®-M0+ Cores

June 2018

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Kinetis L Series MCUs

Our Kinetis L series MCU portfolio includes more than 200 compatible low-power, high-performance 32-bit MCUs built on the Arm® Cortex®-M0+ core. This series combines the exceptional low-power performance and energy-efficiency of the Arm Cortex-M0+ core with the performance, peripheral sets, enablement and scalability of the Kinetis MCU portfolio, making it an ideal solution for Internet of Things (IoT) applications.

Ultra-Low Power—Architected for power efficiency, the Kinetis L series takes advantage of the ultra-low-power Cortex-M0+ processor and features peripherals that help you optimize power consumption. Kinetis L series MCUs provide ultra-low dynamic consumption, ultra-low static consumption, rich low-power modes and innovative low-power peripherals.

Ultra-Small Scale—Take advantage of rich package options from 8 x 8 mm^2 121XFBGA, 10 x 10 mm^2 100LQFP, all the way down to the world's smallest Arm-based device—the Kinetis KL03 20WLCSP MCU.

Super Easy to Use—Simplify development with an upward migration path to Kinetis K series MCUs. With a comprehensive enablement bundle, including low-cost Tower® System and Freedom boards, Kinetis Design Studio IDE, Kinetis software development kit, our proprietary MQX™ RTOS and the Arm support ecosystem, development is super simple.

Package Your Way for Kinetis MCUs

The Package Your Way program, specific for Kinetis MCUs, takes Kinetis MCU package options to the level. NXP now offers 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 **www.nxp.com/KPYW**.

COMPREHENSIVE ENABLEMENT SOLUTIONS

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

Getting Started

- Software and tools for Kinetis MCUs
- Solution Advisor
- Kinetis MCU community

Development Hardware

- 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 our proprietary MQX™ RTOS, FreeRTOS, and Micrium µC/OS kernels and Baremetal (no RTOS) applications

Processor Expert Software and Embedded Components

- Complimentary software configuration tool providing I/O allocation and pin initialization and configuration of hardware abstraction and peripheral drivers

Integrated Development Environments (IDE)

- Kinetis Design Studio IDE – No-cost, Eclipse and GCC-based IDE for C/C++ editing, compiling and debugging
- IAR Embedded Workbench®
- Arm Keil® MCU Development Kit
- Green Hills™ Software MULTI
- Broad Arm ecosystem support through the NXP 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

Proprietary 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 KL0x Family of Baseline MCUs

OVERVIEW

The Kinetis KL0x MCU family, based on the Arm® Cortex®-M0+ core, is the entry point into the Kinetis L series MCU portfolio and provides a bridge from 8-bit MCUs to 32-bit Kinetis L series MCUs. Devices start from 8 KB of flash and are offered in several small-footprint package options. The Kinetis KL0x MCU family provides the perfect balance of performance and power consumption, running at 48 MHz, while offering low dynamic power consumption and best-in-class static current consumption with more than 9 flexible low-power modes. Each family member combines 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 KL0x MCU family, **click here**.

TARGET APPLICATIONS

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

SUB-FAMILY KL0X: BASELINE MCUS

Footnotes	Part Number	CPU Frequency (MHz)	Pin Count	Package	Flash	SRAM (KB)	Boot ROM (KB)	Cache (Bytes)	Register Fil (Bytes)	Low-Power UART	SPI QTY (#Chip Select of Each SPI)	I^2C	RTC (32 kHz Osc, V_{BAT})	PIT (32-Bit)	General-Purpose PWM (6 ch/2 ch)	Low-Power Timer	Watchdog (SW/HW)	Total 12-Bit ADC SE (Channels)	12-Bit DAC	Analog Comparator	Analog Comparator Inputs	V_{REF}	MCG	48 MHz IRC	Main OSC	DMA (channels)	Total GPIOS	GPIO With Interrupt/ High-Drive Pins	Evaluation Board (Appendix Page 17)
	MKL02Z8VFG4	48	16	QFN	8	1		32	-	1	1(1)	1	-	-	0/2	1	1/0	6	-	1	2/0/0/0	-	FLL	-	32-40kHz	-	14	9/2	F1
	MKL02Z16VFG4	48	16	QFN	16	2		32	-	1	1(1)	1	-	-	0/2	1	1/0	6	-	1	2/0/0/0	-	FLL	-	32-40kHz	-	14	9/2	F1
	MKL02Z32VFG4	48	16	QFN	32	4		32	-	1	1(1)	1	-	-	0/2	1	1/0	6	-	1	2/0/0/0	-	FLL	-	32-40kHz	-	14	9/2	F1
	MKL02Z32CAF4R	48	20	WLCSP	32	4		32	-	1	1(1)	1	-	-	0/2	1	1/0	10	-	1	2/0/0/0	-	FLL	-	32-40kHz	-	18	10/2	F1
	MKL02Z16VFK4	48	24	QFN	16	2		32	-	1	1(1)	1	-	-	0/2	1	1/0	12	-	1	4/0/0/0	-	FLL	-	32-40kHz	-	22	12/3	F1
	MKL02Z32VFK4	48	24	QFN	32	4		32	-	1	1(1)	1	-	-	0/2	1	1/0	12	-	1	4/0/0/0	-	FLL	-	32-40kHz	-	22	12/3	F1
	MKL02Z16VFM4	48	32	QFN	16	2		32	-	1	1(1)	1	-	-	0/2	1	1/0	14	-	1	4/0/0/0	-	FLL	-	32-40kHz	-	28	14/4	F1
	MKL02Z32VFM4	48	32	QFN	32	4		32	-	1	1(1)	1	-	-	0/2	1	1/0	14	-	1	4/0/0/0	-	FLL	-	32-40kHz	-	28	14/4	F1
[1]	MKL03Z8VFG4	48	16	QFN	8	2	8	-	16	1	1(1)	1	YES (Secure RTC)	-	0/2	1	1/0	4	-	1	4/0/0/0	YES	8/2MHz IRC	YES	32-40kHz	-	14	9/2	F2
[1]	MKL03Z16VFG4	48	16	QFN	16	2	8	-	16	1	1(1)	1	YES (Secure RTC)	-	0/2	1	1/0	4	-	1	4/0/0/0	YES	8/2MHz IRC	YES	32-40kHz	-	14	9/2	F2
[1]	MKL03Z32VFG4	48	16	QFN	32	2	8	-	16	1	1(1)	1	YES (Secure RTC)	-	0/2	1	1/0	4	-	1	4/0/0/0	YES	8/2MHz IRC	YES	32-40kHz	-	14	9/2	F2
[1]	MKL03Z32CAF4R	48	20	WLCSP	32	2	8	-	16	1	1(1)	1	YES (Secure RTC)	-	0/2	1	1/0	7	-	1	5/0/0/0	YES	8/2MHz IRC	YES	32-40kHz	-	18	10/3	F2

SUB-FAMILY KL0X: BASELINE MCUS

Footnotes	Part Number	CPU Frequency (MHz)	Pin Count	Package	Flash	SRAM (KB)	Boot ROM (KB)	Cache (Bytes)	Register Fil (Bytes)	Low-Power UART	SPI QTY (#Chip Select of Each SPI)	I^2C	RTC (32 kHz Osc, V_{BAT})	PIT (32-Bit)	General-Purpose PWM (6 ch/2 ch)	Low-Power Timer	Watchdog (SW/HW)	Total 12-Bit ADC SE (Channels)	12-Bit DAC	Analog Comparator	Analog Comparator Inputs	V_{REF}	MCG	48 MHz IRC	Main OSC	DMA (channels)	Total GPIOS	GPIO With Interrupt/ High-Drive Pins	Evaluation Board (Appendix Page 17)
[1]	MKL03Z8VFK4	48	24	QFN	8	2	8	-	16	1	1(1)	1	YES (Secure RTC)	-	0/2	1	1/0	7	-	1	5/0/0/0	YES	8/2MHz IRC	YES	32-40kHz	-	22	12/3	F2
[1]	MKL03Z16VFK4	48	24	QFN	16	2	8	-	16	1	1(1)	1	YES (Secure RTC)	-	0/2	1	1/0	7	-	1	5/0/0/0	YES	8/2MHz IRC	YES	32-40kHz	-	22	12/3	F2
[1]	MKL03Z32VFK4	48	24	QFN	32	2	8	-	16	1	1(1)	1	YES (Secure RTC)	-	0/2	1	1/0	7	-	1	5/0/0/0	YES	8/2MHz IRC	YES	32-40kHz	-	22	12/3	F2
	MKL04Z8VFK4	48	24	QFN	8	1		64	-	1	1(1)	1	YES (Secure RTC)	1x2ch	1/1	1	1/0	12	-	1	4/0/0/0	-	FLL	-	32-40kHz/3-32MHz	4	22	12/2	F3
	MKL04Z16VFK4	48	24	QFN	16	2		64	-	1	1(1)	1	YES (Secure RTC)	1x2ch	1/1	1	1/0	12	-	1	4/0/0/0	-	FLL	-	32-40kHz/3-32MHz	4	22	12/2	F3
	MKL04Z32VFK4	48	24	QFN	32	4		64	-	1	1(1)	1	YES (Secure RTC)	1x2ch	1/1	1	1/0	12	-	1	4/0/0/0	-	FLL	-	32-40kHz/3-32MHz	4	22	12/2	F3
	MKL04Z8VLC4	48	32	LQFP	8	1		64	-	1	1(1)	1	YES (Secure RTC)	1x2ch	1/1	1	1/0	14	-	1	4/0/0/0	-	FLL	-	32-40kHz/3-32MHz	4	28	14/4	F3
	MKL04Z16VLC4	48	32	LQFP	16	2		64	-	1	1(1)	1	YES (Secure RTC)	1x2ch	1/1	1	1/0	14	-	1	4/0/0/0	-	FLL	-	32-40kHz/3-32MHz	4	28	14/4	F3
	MKL04Z32VLC4	48	32	LQFP	32	4		64	-	1	1(1)	1	YES (Secure RTC)	1x2ch	1/1	1	1/0	14	-	1	4/0/0/0	-	FLL	-	32-40kHz/3-32MHz	4	28	14/4	F3
	MKL04Z8VFM4	48	32	QFN	8	1		64	-	1	1(1)	1	YES (Secure RTC)	1x2ch	1/1	1	1/0	14	-	1	4/0/0/0	-	FLL	-	32-40kHz/3-32MHz	4	28	14/4	F3
	MKL04Z16VFM4	48	32	QFN	16	2		64	-	1	1(1)	1	YES (Secure RTC)	1x2ch	1/1	1	1/0	14	-	1	4/0/0/0	-	FLL	-	32-40kHz/3-32MHz	4	28	14/4	F3
	MKL04Z32VFM4	48	32	QFN	32	4		64	-	1	1(1)	1	YES (Secure RTC)	1x2ch	1/1	1	1/0	14	-	1	4/0/0/0	-	FLL	-	32-40kHz/3-32MHz	4	28	14/4	F3
	MKL04Z16VLF4	48	48	LQFP	16	2		64	-	1	1(1)	1	YES (Secure RTC)	1x2ch	1/1	1	1/0	14	-	1	4/0/0/0	-	FLL	-	32-40kHz/3-32MHz	4	41	18/4	F3
	MKL04Z32VLF4	48	48	LQFP	32	4		64	-	1	1(1)	1	YES (Secure RTC)	1x2ch	1/1	1	1/0	14	1	1	4/0/0/0	-	FLL	-	32-40kHz/3-32MHz	4	41	18/4	F3
	MKL05Z8VFK4	48	24	QFN	8	1		64	-	1	1(1)	1	YES (Secure RTC)	1x2ch	1/1	1	1/0	12	1	1	4/0/0/0	-	FLL	-	32-40kHz/3-32MHz	4	22	12/2	F3
	MKL05Z16VFK4	48	24	QFN	16	2		64	-	1	1(1)	1	YES (Secure RTC)	1x2ch	1/1	1	1/0	12	1	1	4/0/0/0	-	FLL	-	32-40kHz/3-32MHz	4	22	12/2	F3
	MKL05Z32VFK4	48	24	QFN	32	4		64	-	1	1(1)	1	YES (Secure RTC)	1x2ch	1/1	1	1/0	12	1	1	4/0/0/0	-	FLL	-	32-40kHz/3-32MHz	4	22	12/2	F3
	MKL05Z8VLC4	48	32	LQFP	8	1		64	-	1	1(1)	1	YES (Secure RTC)	1x2ch	1/1	1	1/0	14	1	1	4/0/0/0	-	FLL	-	32-40kHz/3-32MHz	4	28	14/4	F3
	MKL05Z16VLC4	48	32	LQFP	16	2		64	-	1	1(1)	1	YES (Secure RTC)	1x2ch	1/1	1	1/0	14	1	1	4/0/0/0	-	FLL	-	32-40kHz/3-32MHz	4	28	14/4	F3
	MKL05Z32VLC4	48	32	LQFP	32	4		64	-	1	1(1)	1	YES (Secure RTC)	1x2ch	1/1	1	1/0	14	1	1	4/0/0/0	-	FLL	-	32-40kHz/3-32MHz	4	28	14/4	F3
	MKL05Z8VFM4	48	32	QFN	8	1		64	-	1	1(1)	1	YES (Secure RTC)	1x2ch	1/1	1	1/0	14	1	1	4/0/0/0	-	FLL	-	32-40kHz/3-32MHz	4	28	14/4	F3
	MKL05Z16VFM4	48	32	QFN	16	2		64	-	1	1(1)	1	YES (Secure RTC)	1x2ch	1/1	1	1/0	14	1	1	4/0/0/0	-	FLL	-	32-40kHz/3-32MHz	4	28	14/4	F3
	MKL05Z32VFM4	48	32	QFN	32	4		64	-	1	1(1)	1	YES (Secure RTC)	1x2ch	1/1	1	1/0	14	1	1	4/0/0/0	-	FLL	-	32-40kHz/3-32MHz	4	28	14/4	F3
	MKL05Z16VLF4	48	48	LQFP	16	2		64	-	1	1(1)	1	YES (Secure RTC)	1x2ch	1/1	1	1/0	14	1	1	4/0/0/0	-	FLL	-	32-40kHz/3-32MHz	4	41	18/4	F3
	MKL05Z32VLF4	48	48	LQFP	32	4		64	-	1	1(1)	1	YES (Secure RTC)	1x2ch	1/1	1	1/0	14	1	1	4/0/0/0	-	FLL	-	32-40kHz/3-32MHz	4	41	18/4	F3

Common Features
Temp Range: -40°C to 105°C
Voltage Range: 1.71–3.6 V
Flash Write Voltage: 1.71
Debug: SWD
Trace: MTB

Footnotes
[1] I^2C modules supporting up to 1 Mbit/s

Kinetis KL1x Family of General-Purpose MCUs

OVERVIEW

The Kinetis KL1x MCU family is a general-purpose ultra-low-power MCU family, providing additional memory, communications and analog peripheral options beyond those offered in the Kinetis KL0x MCU family. The KL1x MCU family is also compatible with the Kinetis K10 MCU (based on the Arm® Cortex®-M4 core) and with all other Kinetis KL2x, KL3x and KL4x MCU families, providing a migration path to higher performance and feature integration. For more information about the Kinetis KL1x MCU family, **click here**.

TARGET APPLICATIONS:

Remote controls, smart watches, air mouse, wearables, wireless healthcare, building control, security systems, smoke detectors

SUB-FAMILY KL1X: GENERAL-PURPOSE MCUS

Footnotes	Part Number	CPU Frequency (MHz)	Pin Count	Package	Flash	SRAM (KB)	Boot ROM (KB)	UART w/ISO7816	Low-Power UART	UART	SPI QTY (#Chip Select of Each SPI)	I²C	I²S	FlexIO	General-Purpose PWM (6ch/2ch)	Low-Power Timer	Watchdog (SW/HW)	No. of ADC Modules (16 Bit/12 Bit)	ADC Channels (SE/DP)	12-Bit DAC	Analog Comparator	Analog Comparator Inputs	V_{REF}	MCG	48 MHz IRC	DMA (channels)	Total GPIOS	GPIO With Interrupt/ High-Drive Pins	TSI (Capacitive Touch) Channels	Evaluation Board (Appendix Page 17)
[1,2]	MKL13Z32VFM4	48	32	QFN	32	4	8	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	11/2	1	1	3/0/0/0	-	8/2MHz IRC	YES	4	28	28/4	-	F5
[1,2]	MKL13Z32VFT4	48	48	QFN	32	4	8	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	18/2	1	1	4/0/0/0	YES	8/2MHz IRC	YES	4	40	40/4	-	F5
[1]	MKL13Z32VLH4	48	64	LQFP	32	4	8	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	YES	8/2MHz IRC	YES	4	54	54/4	-	F5
[1,2]	MKL13Z32VMP4	48	64	MAPBGA	32	4	8	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	YES	8/2MHz IRC	YES	4	54	54/4	-	F5
[1]	MKL13Z32VLK4	48	80	LQFP	32	4	8	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	YES	8/2MHz IRC	YES	4	80	80/4	-	F5
[1,2]	MKL13Z64VFM4	48	32	QFN	64	8	8	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	11/2	1	1	3/0/0/0	-	8/2MHz IRC	YES	4	28	28/4	-	F5
[1,2]	MKL13Z64VFT4	48	48	QFN	64	8	8	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	18/2	1	1	4/0/0/0	YES	8/2MHz IRC	YES	4	40	40/4	-	F5
[1]	MKL13Z64VLH4	48	64	LQFP	64	8	8	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	YES	8/2MHz IRC	YES	4	54	54/4	-	F5
[1,2]	MKL13Z64VMP4	48	64	MAPBGA	64	8	8	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	YES	8/2MHz IRC	YES	4	54	54/4	-	F5
[1]	MKL13Z64VLK4	48	80	LQFP	64	8	8	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	YES	8/2MHz IRC	YES	4	80	80/4	-	F5
	MKL14Z32VFM4	48	32	QFN	32	4	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	0/1	11/0	-	1	3/0/0/0	-	FLL, PLL	-	4	28	12/2	-	F8,T3
	MKL14Z64VFM4	48	32	QFN	64	8	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	0/1	11/0	-	1	3/0/0/0	-	FLL, PLL	-	4	28	12/2	-	F8,T3
	MKL14Z32VFT4	48	48	QFN	32	4	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	0/1	18/0	-	1	4/0/0/0	-	FLL, PLL	-	4	40	16/4	-	F8,T3
	MKL14Z64VFT4	48	48	QFN	64	8	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	0/1	18/0	-	1	4/0/0/0	-	FLL, PLL	-	4	40	16/4	-	F8,T3
	MKL14Z32VLH4	48	64	LQFP	32	4	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	0/1	20/0	-	1	6/0/0/0	-	FLL, PLL	-	4	54	19/4	-	F8,T3
	MKL14Z64VLH4	48	64	LQFP	64	8	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	0/1	20/0	-	1	6/0/0/0	-	FLL, PLL	-	4	54	19/4	-	F8,T3
	MKL14Z32VLK4	48	80	LQFP	32	4	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	0/1	20/0	-	1	6/0/0/0	-	FLL, PLL	-	4	70	23/4	-	F8,T3
	MKL14Z64VLK4	48	80	LQFP	64	8	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	0/1	20/0	-	1	6/0/0/0	-	FLL, PLL	-	4	70	23/4	-	F8,T3
	MKL15Z32VFM4	48	32	QFN	32	4	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	1/0	11/2	1	1	3/0/0/0	-	FLL, PLL	-	4	28	19/4	9	F8,T3
	MKL15Z64VFM4	48	32	QFN	64	8	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	1/0	11/2	1	1	3/0/0/0	-	FLL, PLL	-	4	28	19/4	9	F8,T3
	MKL15Z128VFM4	48	32	QFN	128	16	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	1/0	11/2	1	1	3/0/0/0	-	FLL, PLL	-	4	28	19/4	9	F8,T3
	MKL15Z128CAD4R	48	35	WLCSP	128	16	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	1/0	14/3	1	1	3/0/0/0	-	FLL, PLL	-	4	31	19/4	9	F8,T3
	MKL15Z32VFT4	48	48	QFN	32	4	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	1/0	18/3	1	1	4/0/0/0	-	FLL, PLL	-	4	40	24/4	14	F8,T3

SUB-FAMILY KL1X: GENERAL-PURPOSE MCUS

Footnotes	Part Number	CPU Frequency (MHz)	Pin Count	Package	Flash	SRAM (KB)	Boot ROM (KB)	UART w/ISO7816	Low-Power UART	UART	SPI QTY (#Chip Select of Each SPI)	I²C	I²S	FlexIO	General-Purpose PWM (6ch/2ch)	Low-Power Timer	Watchdog (SW/HW)	No. of ADC Modules (16 Bit/12 Bit)	ADC Channels (SE/DP)	12-Bit DAC	Analog Comparator	Analog Comparator Inputs	V_{REF}	MCG	48 MHz IRC	DMA (channels)	Total GPIOS	GPIO With Interrupt/High-Drive Pins	TSI (Capacitive Touch) Channels	Evaluation Board (Appendix Page 17)
	MKL15Z64VFT4	48	48	QFN	64	8	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	1/0	18/3	1	1	4/0/0/0	-	FLL, PLL	-	4	40	24/4	14	F8,T3
	MKL15Z128VFT4	48	48	QFN	128	16	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	1/0	18/3	1	1	4/0/0/0	-	FLL, PLL	-	4	40	24/4	14	F8,T3
	MKL15Z32VLH4	48	64	LQFP	32	4	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	-	FLL, PLL	-	4	54	31/4	16	F8,T3
	MKL15Z64VLH4	48	64	LQFP	64	8	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	-	FLL, PLL	-	4	54	31/4	16	F8,T3
	MKL15Z128VLH4	48	64	LQFP	128	16	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	-	FLL, PLL	-	4	54	31/4	16	F8,T3
	MKL15Z32VLK4	48	80	LQFP	32	4	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	-	FLL, PLL	-	4	70	39/4	16	F8,T3
	MKL15Z64VLK4	48	80	LQFP	64	8	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	-	FLL, PLL	-	4	70	39/4	16	F8,T3
	MKL15Z128VLK4	48	80	LQFP	128	16	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	-	FLL, PLL	-	4	70	39/4	16	F8,T3
	MKL16Z256VLH4	48	64	LQFP	256	32	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	-	FLL, PLL	-	4	54	31/4	16	F7
	MKL16Z256VMP4	48	64	MAPBGA	256	32	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	-	FLL, PLL	-	4	54	31/4	16	F7
	MKL16Z32VFM4	48	32	QFN	32	4	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	11/2	1	1	3/0/0/0	-	FLL, PLL	-	4	28	19/4	9	F7
	MKL16Z64VFM4	48	32	QFN	64	8	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	11/2	1	1	3/0/0/0	-	FLL, PLL	-	4	28	19/4	9	F7
	MKL16Z128VFM4	48	32	QFN	128	16	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	11/2	1	1	3/0/0/0	-	FLL, PLL	-	4	28	19/4	9	F7
	MKL16Z32VFT4	48	48	QFN	32	4	-	-	1	1	2(1/1)	2	1	-	1/2	1	1/0	1/0	18/3	1	1	4/0/0/0	-	FLL, PLL	-	4	40	24/4	14	F7
	MKL16Z64VFT4	48	48	QFN	64	8	-	-	1	1	2(1/1)	2	1	-	1/2	1	1/0	1/0	18/3	1	1	4/0/0/0	-	FLL, PLL	-	4	40	24/4	14	F7
	MKL16Z128VFT4	48	48	QFN	128	16	-	-	1	1	2(1/1)	2	1	-	1/2	1	1/0	1/0	18/3	1	1	4/0/0/0	-	FLL, PLL	-	4	40	24/4	14	F7
	MKL16Z32VLH4	48	64	LQFP	32	4	-	-	1	1	2(1/1)	2	1	-	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	-	FLL, PLL	-	4	54	31/4	16	F7
	MKL16Z64VLH4	48	64	LQFP	64	8	-	-	1	1	2(1/1)	2	1	-	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	-	FLL, PLL	-	4	54	31/4	16	F7
	MKL16Z128VLH4	48	64	LQFP	128	16	-	-	1	1	2(1/1)	2	1	-	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	-	FLL, PLL	-	4	54	31/4	16	F7
[1,2]	MKL17Z32VFM4	48	32	QFN	32	8	16	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	11/2	-	1	3/0/0/0	YES	8/2MHz IRC	YES	4	28	28/6	-	F6 ,T2
[1,2]	MKL17Z64VFM4	48	32	QFN	64	16	16	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	11/2	-	1	3/0/0/0	YES	8/2MHz IRC	YES	4	28	28/6	-	F6, T2
[1]	MKL17Z32VDA4	48	36	XFBGA	32	8	16	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	15/4	-	1	3/0/0/0	YES	8/2MHz IRC	YES	4	32	32/6	-	F6, T2
[1]	MKL17Z64VDA4	48	36	XFBGA	64	16	16	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	15/4	-	1	3/0/0/0	YES	8/2MHz IRC	YES	4	32	32/6	-	F6, T2
[1,2]	MKL17Z32VFT4	48	48	QFN	32	8	16	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	18/3	-	1	4/0/0/0	YES	8/2MHz IRC	YES	4	40	40/6	-	F6, T2
[1,2]	MKL17Z64VFT4	48	48	QFN	64	16	16	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	18/3	-	1	4/0/0/0	YES	8/2MHz IRC	YES	4	40	40/6	-	F5, T2
[1,2]	MKL17Z32VMP4	48	64	MAPBGA	32	8	16	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	20/4	-	1	6/0/0/0	YES	8/2MHz IRC	YES	4	54	54/6	-	F6, T2
[1,2]	MKL17Z64VMP4	48	64	MAPBGA	64	16	16	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	20/4	-	1	6/0/0/0	YES	8/2MHz IRC	YES	4	54	54/6	-	F6, T2
[1]	MKL17Z32VLH4	48	64	LQFP	32	8	16	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	20/4	-	1	6/0/0/0	YES	8/2MHz IRC	YES	4	54	54/6	-	F6, T2
[1]	MKL17Z64VLH4	48	64	LQFP	64	16	16	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	20/4	-	1	6/0/0/0	YES	8/2MHz IRC	YES	4	54	54/6	-	F6, T2
[1]	MKL17Z128VFM4	48	32	QFN	128	32	16	1	2	-	2(1/1)	2	1	YES	1/2	1	1/0	1/0	11/2	1	1	3/0/0/0	YES	8/2MHz IRC	YES	4	28	19/6	-	F5, T2
[1]	MKL17Z256VFM4	48	32	QFN	256	32	16	1	2	-	2(1/1)	2	1	YES	1/2	1	1/0	1/0	11/2	1	1	3/0/0/0	YES	8/2MHz IRC	YES	4	28	19/6	-	F5, T2
[1]	MKL17Z128VFT4	48	48	QFN	128	32	16	1	2	-	2(1/1)	2	1	YES	1/2	1	1/0	1/0	18/3	1	1	4/0/0/0	YES	8/2MHz IRC	YES	4	40	24/6	-	F5, T2
[1]	MKL17Z256VFT4	48	48	QFN	256	32	16	1	2	-	2(1/1)	2	1	YES	1/2	1	1/0	1/0	18/3	1	1	4/0/0/0	YES	8/2MHz IRC	YES	4	40	24/6	-	F5, T2
[1]	MKL17Z128VLH4	48	64	LQFP	128	32	16	1	2	-	2(1/1)	2	1	YES	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	YES	8/2MHz IRC	YES	4	54	31/6	-	F5, T2
[1]	MKL17Z256VLH4	48	64	LQFP	256	32	16	1	2	-	2(1/1)	2	1	YES	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	YES	8/2MHz IRC	YES	4	54	31/6	-	F5, T2
[1]	MKL17Z128VMP4	48	64	MAPBGA	128	32	16	1	2	-	2(1/1)	2	1	YES	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	YES	8/2MHz IRC	YES	4	54	31/6	-	F5, T2
[1]	MKL17Z256VMP4	48	64	MAPBGA	256	32	16	1	2	-	2(1/1)	2	1	YES	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	YES	8/2MHz IRC	YES	4	54	31/6	-	F5, T2

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

32-Byte Register File
64-Byte Cache
Main OSC (Oscillator crystal/resonator): 32–40 KHz/8–32 MHz

Debug: SWD
Trace: MTB
PIT (32-bit): 1 x 2 ch
Secure RTC

Footnotes
[1] I²C0 modules supporting up to 1 Mbit/s
[2] This package is included in the Package Your Way program for Kinetis MCUs. For more details, please visit www.nxp.com/KPYW

Kinetis KL2x Family of USB MCUs

OVERVIEW

The Kinetis KL2x ultra-low-power MCU family adds a full-speed USB 2.0 On-the-Go (OTG) controller or a full-speed crystal-less USB 2.0 device controller, features beyond those offered by the Kinetis KL1x MCU family. The Kinetis KL2x MCU family is also compatible with the Kinetis K20 MCU (based on the Arm® Cortex®-M4 core), and with all other Kinetis KL1x, KL3x and KL4x MCU families, providing a migration path to lower and higher performance and feature integration. For more information about the Kinetis KL2x MCU family, **click here**.

TARGET APPLICATIONS:

Entry-level security, game controllers and accessories, PC peripherals and accessories, USB-audio bridges, portable accessories, wearable, sensor fusion/ IoT nodes, sports and activity wearables.

SUB-FAMILY KL2X: USB MCUS

Footnotes	Part Number	CPU Frequency (MHz)	Pin Count	Package	Flash	SRAM (KB)	Boot ROM (KB)	UART w/ ISO7816	Low-Power UART	High Baud Rate UART	SPI QTY (#Chip Select of Each SPI)	I²C	I²S	FlexIO	General-Purpose PWM (6ch/2ch)	Low-Power Timer	Watchdog (SW/HW)	No. of ADC Modules (16 Bit/12 Bit)	ADC Channels (SE/DP)	12-Bit DAC	Analog Comparator	Analog Comparator Inputs	V_{REF}	MCG	48 MHz IRC	DMA (channels)	Total GPIOS	GPIO With Interrupt/ High-Drive Pins	TSI (Capacitive Touch) Channels	Evaluation Board (Appendix Page 17)
[1]	MKL24Z32VFM4	48	32	QFN	32	4	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	0/1	7/0	0	1	3/0/0/0	-	FLL, PLL	-	4	23	19/4	-	F8,T3
[1]	MKL24Z64VFM4	48	32	QFN	64	8	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	0/1	7/0	0	1	3/0/0/0	-	FLL, PLL	-	4	23	19/4	-	F8,T3
[1]	MKL24Z32VFT4	48	48	QFN	32	4	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	0/1	14/0	0	1	4/0/0/0	-	FLL, PLL	-	4	36	24/4	-	F8,T3
[1]	MKL24Z64VFT4	48	48	QFN	64	8	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	0/1	14/0	0	1	4/0/0/0	-	FLL, PLL	-	4	36	24/4	-	F8,T3
[1]	MKL24Z32VLH4	48	64	LQFP	32	4	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	0/1	16/0	0	1	6/0/0/0	-	FLL, PLL	-	4	50	31/4	-	F8,T3
[1]	MKL24Z64VLH4	48	64	LQFP	64	8	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	0/1	16/0	0	1	6/0/0/0	-	FLL, PLL	-	4	50	31/4	-	F8,T3
[1]	MKL24Z32VLK4	48	80	LQFP	32	4	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	0/1	16/0	0	1	6/0/0/0	-	FLL, PLL	-	4	66	39/4	-	F8,T3
[1]	MKL24Z64VLK4	48	80	LQFP	64	8	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	0/1	16/0	0	1	6/0/0/0	-	FLL, PLL	-	4	66	39/4	-	F8,T3
[1]	MKL25Z32VFM4	48	32	QFN	32	4	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	1/0	7/0	1	1	3/0/0/0	-	FLL, PLL	-	4	23	12/2	9	F8,T3
[1]	MKL25Z64VFM4	48	32	QFN	64	8	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	1/0	7/0	1	1	3/0/0/0	-	FLL, PLL	-	4	23	12/2	9	F8,T3
[1]	MKL25Z128VFM4	48	32	QFN	128	16	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	1/0	7/0	1	1	3/0/0/0	-	FLL, PLL	-	4	23	12/2	9	F8,T3
[1]	MKL25Z32VFT4	48	48	QFN	32	4	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	1/0	14/1	1	1	4/0/0/0	-	FLL, PLL	-	4	36	16/4	14	F8,T3
[1]	MKL25Z64VFT4	48	48	QFN	64	8	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	1/0	14/1	1	1	4/0/0/0	-	FLL, PLL	-	4	36	16/4	14	F8,T3
[1]	MKL25Z128VFT4	48	48	QFN	128	16	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	1/0	14/1	1	1	4/0/0/0	-	FLL, PLL	-	4	36	16/4	14	F8,T3
[1]	MKL25Z32VLH4	48	64	LQFP	32	4	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	1/0	16/2	1	1	6/0/0/0	-	FLL, PLL	-	4	50	19/4	16	F8,T3
[1]	MKL25Z64VLH4	48	64	LQFP	64	8	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	1/0	16/2	1	1	6/0/0/0	-	FLL, PLL	-	4	50	19/4	16	F8,T3
[1]	MKL25Z128VLH4	48	64	LQFP	128	16	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	1/0	16/2	1	1	6/0/0/0	-	FLL, PLL	-	4	50	19/4	16	F8,T3
[1]	MKL25Z32VLK4	48	80	LQFP	32	4	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	1/0	16/2	1	1	6/0/0/0	-	FLL, PLL	-	4	66	23/4	16	F8,T3
[1]	MKL25Z64VLK4	48	80	LQFP	64	8	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	1/0	16/2	1	1	6/0/0/0	-	FLL, PLL	-	4	66	23/4	16	F8,T3
[1]	MKL25Z128VLK4	48	80	LQFP	128	16	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	1/0	16/2	1	1	6/0/0/0	-	FLL, PLL	-	4	66	23/4	16	F8,T3
[1]	MKL26Z32VFM4	48	32	QFN	32	4	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	7/0	1	1	3/0/0/0	-	FLL, PLL	-	4	23	19/4	9	F7

SUB-FAMILY KL2X: USB MCUS

Footnotes	Part Number	CPU Frequency (MHz)	Pin Count	Package	Flash	SRAM (KB)	Boot ROM (KB)	UART w/ ISO7816	Low-Power UART	High Baud Rate UART	SPI QTY (#Chip Select of Each SPI)	I²C	I²S	FlexIO	General-Purpose PWM (6ch/2ch)	Low-Power Timer	Watchdog (SW/HW)	No. of ADC Modules (16 Bit/12 Bit)	ADC Channels (SE/DP)	12-Bit DAC	Analog Comparator	Analog Comparator Inputs	V_{REF}	MCG	48 MHz IRC	DMA (channels)	Total GPIOS	GPIO With Interrupt/ High-Drive Pins	TSI (Capacitive Touch) Channels	Evaluation Board (Appendix Page 17)
[1]	MKL26Z64VFM4	48	32	QFN	64	8	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	7/0	1	1	3/0/0/0	-	FLL, PLL	-	4	23	19/4	9	F7
[1]	MKL26Z128VFM4	48	32	QFN	128	16	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	7/0	1	1	3/0/0/0	-	FLL, PLL	-	4	23	19/4	9	F7
[1]	MKL26Z128CAL4	48	36	WLCSP	128	16	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	7/0	1	1	3/0/0/0	-	FLL, PLL	-	4	23	12/2	9	F7
[1]	MKL26Z32VFT4	48	48	QFN	32	4	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	11/1	1	1	4/0/0/0	-	FLL, PLL	-	4	36	24/4	14	F7
[1]	MKL26Z64VFT4	48	48	QFN	64	8	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	11/1	1	1	4/0/0/0	-	FLL, PLL	-	4	36	24/4	14	F7
[1]	MKL26Z128VFT4	48	48	QFN	128	16	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	11/1	1	1	4/0/0/0	-	FLL, PLL	-	4	36	24/4	14	F7
[1]	MKL26Z32VLH4	48	64	LQFP	32	4	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	11/1	1	1	4/0/0/0	-	FLL, PLL	-	4	50	31/4	14	F7
[1]	MKL26Z64VLH4	48	64	LQFP	64	8	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	11/1	1	1	4/0/0/0	-	FLL, PLL	-	4	50	31/4	14	F7
[1]	MKL26Z128VLH4	48	64	LQFP	128	16	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	11/1	1	1	4/0/0/0	-	FLL, PLL	-	4	50	31/4	14	F7
[1]	MKL26Z256VLH4	48	64	LQFP	256	32	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	10/2	1	1	6/0/0/0	-	FLL, PLL	-	4	50	31/4	16	F7
[1]	MKL26Z128VMP4	48	64	MAPBGA	128	16	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	10/2	1	1	6/0/0/0	-	FLL, PLL	-	4	50	31/4	16	F7
[1]	MKL26Z256VMP4	48	64	MAPBGA	256	32	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	10/2	1	1	6/0/0/0	-	FLL, PLL	-	4	50	31/4	16	F7
[1]	MKL26Z128VLL4	48	100	LQFP	128	16	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	8/4	1	1	6/0/0/0	-	FLL, PLL	-	4	80	42/4	16	F7
[1]	MKL26Z256VLL4	48	100	LQFP	256	32	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	8/4	1	1	6/0/0/0	-	FLL, PLL	-	4	80	42/4	16	F7
[1]	MKL26Z128VMC4	48	121	MAPBGA	128	16	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	8/4	1	1	6/0/0/0	-	FLL, PLL	-	4	80	42/4	16	F7
[1]	MKL26Z256VMC4	48	121	MAPBGA	256	32	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	8/4	1	1	6/0/0/0	-	FLL, PLL	-	4	80	42/4	16	F7
[2,4,5]	MKL27Z32VFM4	48	32	QFN	32	8	16	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	8/0	0	1	3/0/0/0	YES	8/2MHz IRC	YES	4	24	24/6	-	F5, T2
[2,4,5]	MKL27Z64VFM4	48	32	QFN	64	16	16	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	8/0	0	1	3/0/0/0	YES	8/2MHz IRC	YES	4	24	24/6	-	F6, T2
[2,4]	MKL27Z32VDA4	48	36	XFBGA	32	8	16	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	14/3	0	1	3/0/0/0	YES	8/2MHz IRC	YES	4	30	30/6	-	F6, T2
[2,4]	MKL27Z64VDA4	48	36	XFBGA	64	16	16	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	14/3	0	1	3/0/0/0	YES	8/2MHz IRC	YES	4	30	30/6	-	F6, T2
[2,4,5]	MKL27Z32VFT4	48	48	QFN	32	8	16	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	15/1	0	1	4/0/0/0	YES	8/2MHz IRC	YES	4	37	37/6	-	F6, T2
[2,4,5]	MKL27Z64VFT4	48	48	QFN	64	16	16	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	15/1	0	1	4/0/0/0	YES	8/2MHz IRC	YES	4	37	37/6	-	F5, T2
[2,4,5]	MKL27Z32VMP4	48	64	MAPBGA	32	8	16	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	17/2	0	1	6/0/0/0	YES	8/2MHz IRC	YES	4	51	51/6	-	F5, T2
[2,4,5]	MKL27Z64VMP4	48	64	MAPBGA	64	16	16	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	17/2	0	1	6/0/0/0	YES	8/2MHz IRC	YES	4	51	51/6	-	F5, T2
[2,4]	MKL27Z32VLH4	48	64	LQFP	32	8	16	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	17/2	0	1	6/0/0/0	YES	8/2MHz IRC	YES	4	51	51/6	-	F5, T2
[2,4]	MKL27Z64VLH4	48	64	LQFP	64	16	16	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	17/2	0	1	6/0/0/0	YES	8/2MHz IRC	YES	4	51	51/6	-	F5, T2
[3,4]	MKL27Z128VFM4	48	32	QFN	128	32	16	1	2	-	2(1/1)	2	1	YES	1/2	1	1/0	1/0	7/0	1	1	3/0/0/0	-	8/2MHz IRC	YES	4	23	19/6	-	F5, T2
[3,4]	MKL27Z256VFM4	48	32	QFN	256	32	16	1	2	-	2(1/1)	2	1	YES	1/2	1	1/0	1/0	7/0	1	1	3/0/0/0	-	8/2MHz IRC	YES	4	23	19/6	-	F5, T2
[3,4]	MKL27Z128VFT4	48	48	QFN	128	32	16	1	2	-	2(1/1)	2	1	YES	1/2	1	1/0	1/0	14/1	1	1	4/0/0/0	YES	8/2MHz IRC	YES	4	36	24/4	-	F5, T2
[3,4]	MKL27Z256VFT4	48	48	QFN	256	32	16	1	2	-	2(1/1)	2	1	YES	1/2	1	1/0	1/0	14/1	1	1	4/0/0/0	YES	8/2MHz IRC	YES	4	36	24/4	-	F5, T2
[3,4]	MKL27Z128VLH4	48	64	LQFP	128	32	16	1	2	-	2(1/1)	2	1	YES	1/2	1	1/0	1/0	16/2	1	1	6/0/0/0	YES	8/2MHz IRC	YES	4	50	31/6	-	F5, T2
[3,4]	MKL27Z256VLH4	48	64	LQFP	256	32	16	1	2	-	2(1/1)	2	1	YES	1/2	1	1/0	1/0	16/2	1	1	6/0/0/0	YES	8/2MHz IRC	YES	4	50	31/6	-	F5, T2
[3,4]	MKL27Z128VMP4	48	64	MAPBGA	128	32	16	1	2	-	2(1/1)	2	1	YES	1/2	1	1/0	1/0	16/2	1	1	6/0/0/0	YES	8/2MHz IRC	YES	4	50	31/6	-	F5, T2
[3,4]	MKL27Z256VMP4	48	64	MAPBGA	256	32	16	1	2	-	2(1/1)	2	1	YES	1/2	1	1/0	1/0	16/2	1	1	6/0/0/0	YES	8/2MHz IRC	YES	4	50	31/6	-	F5, T2
[1,2]	MKL28Z512VLL7	72	100	LQFP	512	128	32	1	3	3	3(4/4/4)	3	1	YES	1/2	2	0/1	1/0	27/4	1	2	6	YES	8/2MHz, PLL	YES	8	82	82/8	16	T4, F9

Common Features
Temp Range: -40 °C to 105 °C
Voltage Range: 1 .71–3 .6 V
Flash Write Voltage: 1 .71 V

32-Byte Register File
64-Byte Cache
Main OSC (Oscillator crystal/resonator):
32–40 KHz/8–32 MHz
Debug: SWD, Trace: MTB PIT (32 bit): 1 x 2 ch, Secure RTC

Footnotes
[1] USB OTG LS/FS [2] Crystal-less USB, Device Only, Low-Power Keep Alive
[3] Crystal-less USB, Device Only [4] I²C0 modules supporting up to 1 Mbit/s
[5] This package is included in the Package Your Way program for Kinetis MCUs. For more details, please visit www.nxp.com/KPYW

Kinetis KL3x Family of Segment LCD MCUs

OVERVIEW

The Kinetis KL3x ultra-low-power MCU family adds a segment LCD controller beyond the features provided by the KL1x MCU family. The Kinetis KL3x MCU family is also compatible with the Kinetis K30 MCU (based on the Arm® Cortex®-M4 processor), and with all other Kinetis KL1x, KL2x and KL4x MCU families, providing a migration path to lower and higher performance and feature integration. For more information about the Kinetis KL3x MCU family, **click here**.

TARGETED APPLICATIONS:

Smart water meters, smart gas meters, smart heat meters, heat cost allocators, thermostats, activity and wellness monitors, blood glucose meters, portable medical devices

SUB-FAMILY KL3X: SEGMENT LCD MCUS

Footnotes	Part Number	CPU Frequency (MHz)	Pin Count	Package	Flash	SRAM (KB)	Boot ROM (KB)	UART w/ ISO7816	Low-Power UART	High Baud Rate UART	SPI QTY (#Chip Select of Each SPI)	I²C	I²S	FlexIO	General-Purpose PWM (6ch/2ch)	Low-Power Timer	Watchdog (SW/HW)	No. of ADC Modules (16 Bit/12 Bit)	ADC Channels (SE/DP)	12-Bit DAC	Analog Comparator	Analog Comparator Inputs	V_{REF}	MCG	48 MHz IRC	DMA (channels)	Segment LCD	Total GPIOS	GPIO With Interrupt/High-Drive Pins	TSI(Capacitive Touch) Channels	Evaluation Board (Appendix Page 17)
[1,2]	MKL33Z32VFT4	48	48	QFN	32	4	8	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	17/3	1	1	6/0/0/0	YES	8/2MHz IRC	YES	4	20x8/22x6/24x4	40	40/4	-	F5
[1]	MKL33Z32VLH4	48	64	LQFP	32	4	8	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	YES	8/2MHz IRC	YES	4	28x8/30x6/32x4	54	54/4	-	F5
[1,2]	MKL33Z32VMP4	48	64	MAPBGA	32	4	8	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	YES	8/2MHz IRC	YES	4	28x8/30x6/32x4	54	54/4	-	F5
[1]	MKL33Z32VLK4	48	80	LQFP	32	4	8	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	YES	8/2MHz IRC	YES	4	40x8/42x6/44x4	70	70/4	-	F5
[1,2]	MKL33Z64VFT4	48	48	QFN	64	4	8	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	17/3	1	1	6/0/0/0	YES	8/2MHz IRC	YES	4	20x8/22x6/24x4	40	40/4	-	F5
[1]	MKL33Z64VLH4	48	64	LQFP	64	8	8	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	20/4	1	1	60/0/0	YES	8/2MHz IRC	YES	4	28x8/30x6/32x4	54	54/4	-	F5
[1,2]	MKL33Z64VMP4	48	64	MAPBGA	64	8	8	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	YES	8/2MHz IRC	YES	4	28x8/30x6/32x4	54	54/4	-	F5
[1]	MKL33Z64VLK4	48	80	LQFP	64	8	8	1	2	-	2(1/1)	2	-	YES	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	YES	8/2MHz IRC	YES	4	40x8/42x6/44x4	70	70/4	-	F5
[1]	MKL33Z128VLH4	48	64	LQFP	128	16	16	1	2	-	2(1/1)	2	1	YES	1/2	1	1/0	1/0	20/4	1	1	3/0/0/0	YES	8/2MHz IRC	YES	4	28x8/32x4	54	31/6	-	F5,T2
[1]	MKL33Z256VLH4	48	64	LQFP	256	32	16	1	2	-	2(1/1)	2	1	YES	1/2	1	1/0	1/0	20/4	1	1	3/0/0/0	YES	8/2MHz IRC	YES	4	28x8/32x4	54	31/6	-	F5,T2

SUB-FAMILY KL3X: SEGMENT LCD MCUS

Footnotes	Part Number	CPU Frequency (MHz)	Pin Count	Package	Flash	SRAM (KB)	Boot ROM (KB)	UART w/ ISO7816	Low-Power UART	High Baud Rate UART	SPI QTY (#Chip Select of Each SPI)	I²C	I²S	FlexIO	General-Purpose PWM (6ch/2ch)	Low-Power Timer	Watchdog (SW/HW)	No. of ADC Modules (16 Bit/12 Bit)	ADC Channels (SE/DP)	12-Bit DAC	Analog Comparator	Analog Comparator Inputs	V_{REF}	MCG	48 MHz IRC	DMA (channels)	Segment LCD	Total GPIOS	GPIO With Interrupt/High-Drive Pins	TSI(Capacitive Touch) Channels	Evaluation Board (Appendix Page 17)
[1]	MKL33Z128VMP4	48	64	MAPBGA	128	16	16	1	2	-	2(1/1)	2	1	YES	1/2	1	1/0	1/0	20/4	1	1	4/0/0/0	YES	8/2MHz IRC	YES	4	28x8/32x4	54	31/6	-	F5,T2
[1]	MKL33Z256VMP4	48	64	MAPBGA	256	32	16	1	2	-	2(1/1)	2	1	YES	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	YES	8/2MHz IRC	YES	4	28x8/32x4	54	31/6	-	F5,T2
	MKL34Z64VLH4	48	64	LQFP	64	8	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	1/0	16/0	0	1	6/0/0/0	-	FLL, PLL	-	4	28x8/32x4	54	35/4	-	F4,T1
	MKL34Z64VLL4	48	100	LQFP	64	8	-	-	1	2	2(1/1)	2	-	-	1/2	1	1/0	1/0	16/0	0	1	6/0/0/0	-	FLL, PLL	-	4	51x8/55x4	84	46/4	-	F4,T1
	MKL36Z64VLH4	48	64	LQFP	64	8	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	-	FLL, PLL	-	4	28x8/32x4	54	31/4	16	F4,T1
	MKL36Z128VLH4	48	64	LQFP	128	16	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	20/4	1	1	4/0/0/0	-	FLL, PLL	-	4	28x8/32x4	54	31/4	16	F4,T1
	MKL36Z256VLH4	48	64	LQFP	256	32	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	-	FLL, PLL	-	4	28x8/32x4	54	31/4	16	F4,T1
	MKL36Z256VMP4	48	64	MAPBGA	256	32	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	20/4	1	1	4/0/0/0	-	FLL, PLL	-	4	28x8/32x4	54	31/4	16	F4,T1
	MKL36Z64VLL4	48	100	LQFP	64	8	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	20/4	1	1	4/0/0/0	-	FLL, PLL	-	4	51x8/55x4	84	46/4	16	F4,T1
	MKL36Z128VLL4	48	100	LQFP	128	16	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	20/4	1	1	4/0/0/0	-	FLL, PLL	-	4	51x8/55x4	84	46/4	16	F4,T1
	MKL36Z256VLL4	48	100	LQFP	256	32	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	20/4	1	1	4/0/0/0	-	FLL, PLL	-	4	51x8/55x4	84	46/4	16	F4,T1
	MKL36Z128VMC4	48	121	MAPBGA	128	16	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	-	FLL, PLL	-	4	51x8/55x4	84	46/4	16	F4,T1
	MKL36Z256VMC4	48	121	MAPBGA	256	32	-	-	1	2	2(1/1)	2	1	-	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	-	FLL, PLL	-	4	51x8/55x4	84	46/4	16	F4,T1

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

32-Byte Register File
64-Byte Cache
Main OSC (Oscillator crystal/ resonator): 32–40 KHz/8–32 MHz

Footnotes
[1] I²C0 modules supporting up to 1 Mbit/s

Kinetis KL4x Family of USB and Segment LCD MCUs

OVERVIEW

The Kinetis KL4x ultra-low-power MCU family adds a segment LCD controller beyond the features provided by the KL2x MCU family. The Kinetis KL4x MCU family is also compatible with the Kinetis K40 MCU (based on the Arm® Cortex®-M4 processor), and with all other Kinetis KL1x, KL2x and KL3x MCU families, providing a migration path to lower and higher performance and feature integration. For more information about the Kinetis KL4x MCU family, **click here**.

TARGETED APPLICATIONS:

Smart watches, thermostats, flow meters, blood glucose monitors, multi-parameter patient monitors, building control, home automation

SUB-FAMILY KL4X: USB AND SEGMENT LCD MCUS

Footnotes	Part Number	CPU Frequency (MHz)	Pin Count	Package	Flash	SRAM (KB)	Boot ROM (KB)	UART w/ ISO7816	Low-Power UART	High Baud Rate UART	SPI QTY (#Chip Select of Each SPI)	I²C	I²S	FlexIO	General Purpose PWM (6ch/2ch)	Low-Power Timer	Watchdog (SW/HW)	No. of ADC Modules (16 Bit/12 Bit)	ADC Channels (SE/DP)	12-Bit DAC	Analog Comparator	Analog Comparator Inputs	V_{REF}	MCG	48 MHz IRC	DMA (channels)	Segment LCD	Total GPIOS	GPIO With Interrupt/High-Drive Pins	TSI (Capacitive Touch) Channels	Evaluation Board (Appendix Page 17)
[2,3]	MKL43Z128VLH4	48	64	LQFP	128	16	16	1	2	-	2(1/1)	2	1	YES	1/2	1	1/0	1/0	16/2	1	1	6/0/0/0	YES	8/2MHz IRC	YES	4	24x8/28x4	50	31/6	-	F5,T2
[2,3]	MKL43Z256VLH4	48	64	LQFP	256	32	16	1	2	-	2(1/1)	2	1	YES	1/2	1	1/0	1/0	16/2	1	1	6/0/0/0	YES	8/2MHz IRC	YES	4	24x8/28x4	50	31/6	-	F5,T2
[2,3]	MKL43Z128VMP4	48	64	MAPBGA	128	16	16	1	2	-	2(1/1)	2	1	YES	1/2	1	1/0	1/0	16/2	1	1	6/0/0/0	YES	8/2MHz IRC	YES	4	24x8/28x4	50	31/6	-	F5,T2
[2,3]	MKL43Z256VMP4	48	64	MAPBGA	256	32	16	1	2	-	2(1/1)	2	1	YES	1/2	1	1/0	1/0	16/2	1	1	6/0/0/0	YES	8/2MHz IRC	YES	4	24x8/28x4	50	31/6	-	F5,T2
[1]	MKL46Z128VLH4	48	64	LQFP	128	16	-	-	1	2	2(1/1)	2	1	YES	1/2	1	1/0	1/0	16/2	1	1	4/0/0/0	-	FLL, PLL	-	4	24x8/28x4	50	31/4	-	F4,T1
[1]	MKL46Z256VLH4	48	64	LQFP	256	32	-	-	1	2	2(1/1)	2	1	YES	1/2	1	1/0	1/0	16/2	1	1	4/0/0/0	-	FLL, PLL	-	4	24x8/28x4	50	31/4	-	F4,T1
[1]	MKL46Z256VMP4	48	64	MAPBGA	256	32	-	-	1	2	2(1/1)	2	1	YES	1/2	1	1/0	1/0	16/2	1	1	4/0/0/0	-	FLL, PLL	-	4	24x8/28x4	50	31/4	16	F4,T1
[1]	MKL46Z128VLL4	48	100	LQFP	128	16	-	-	1	2	2(1/1)	2	1	YES	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	-	FLL, PLL	-	4	51x8/55x4	84	46/4	16	F4,T1
[1]	MKL46Z256VLL4	48	100	LQFP	256	32	-	-	1	2	2(1/1)	2	1	YES	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	-	FLL, PLL	-	4	51x8/55x4	84	46/4	16	F4,T1
[1]	MKL46Z128VMC4	48	121	MAPBGA	128	16	-	-	1	2	2(1/1)	2	1	YES	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	-	FLL, PLL	-	4	51x8/55x4	84	46/4	16	F4,T1
[1]	MKL46Z256VMC4	48	121	MAPBGA	256	32	-	-	1	2	2(1/1)	2	1	YES	1/2	1	1/0	1/0	20/4	1	1	6/0/0/0	-	FLL, PLL	-	4	51x8/55x4	84	46/4	16	F4,T1
[1,2]	MKL82Z128VLK7	72	80	LQFP	128	96	32	2	3	3	2(5/4)	2	-	YES	1/2	2	0/1	1/0	14/1	1	1	5	YES	8/2MHz, PLL,FLL	YES	8(Async)	-	56	56/0	16	T5, F10
[1,2]	MKL82Z128VMC7	72	121	MAPBGA	128	96	32	2	3	3	2(5/4)	2	-	YES	1/2	2	0/1	1/0	16/2	1	1	5	YES	8/2MHz, PLL,FLL	YES	8(Async)	-	85	85/0	16	T5, F10
[1,2]	MKL82Z128VMP7	72	64	MAPBGA	128	96	32	2	3	3	2(5/3)	2	-	YES	1/2	2	0/1	1/0	11/1	1	1	5	YES	8/2MHz, PLL,FLL	YES	8(Async)	-	41	41/0	16	T5, F10

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

32-Byte Register File
64-Byte Cache
Main OSC (Oscillator crystal/resonator):
32–40 KHz/8–32 MHz

PIT (32 bit): 1 x 2 ch
Secure RTC

Footnotes
[1] USB OTG LS/FS
[2] Crystal-less USB, Device Only
[3] I²C0 modules supporting up to 1 Mbit/s

Kinetis KL8x Family of Secure MCUs

OVERVIEW

The Kinetis KL8x MCU expands on the Kinetis low-power MCU portfolio with rich security features including tamper detection, true random number generator and low-power trusted crypto engine supporting AES, DES, 3DES, SHA, RSA and ECC. Please contact your local NXP representative to download the KL81 Data sheet and Reference Manual document (under NDA).

TARGETED APPLICATIONS:

mPOS, Smart POS, Sensor node with security, Accessories with authentication, Wearable/Building Control/Medical with data protection

SUB-FAMILY KL8X: SECURE MCUS

Footnotes	Part Number	CPU Frequency (MHz)	Pin Count	Package	Flash	SRAM (KB)	Boot ROM (KB)	UART w/ ISO7816	Low-Power UART	High Baud Rate UART	SPI QTY (#Chip Select of Each SPI)	I²C	I²S	FlexIO	General Purpose PWM (6ch/2ch)	Low-Power Timer	Watchdog (SW/HW)	No. of ADC Modules (16 Bit/12 Bit)	ADC Channels (SE/DP)	12-Bit DAC	Analog Comparator	Analog Comparator Inputs	V_{REF}	MCG	48 MHz IRC	DMA (channels)	Segment LCD	Total GPIOS	GPIO With Interrupt/High-Drive Pins	TSI (Capacitive Touch) Channels	Evaluation Board (Appendix Page 17)
[1,2]	MKL82Z128VLK7	72	80	LQFP	128	96	32	2	3	3	2(5/4)	2	-	YES	1/2	2	0/1	1/0	14/1	1	1	5	YES	8/2MHz, PLL,FLL	YES	8(Async)	-	56	56/0	16	T5, F10
[1,2]	MKL82Z128VMC7	72	121	MAPBGA	128	96	32	2	3	3	2(5/4)	2	-	YES	1/2	2	0/1	1/0	16/2	1	1	5	YES	8/2MHz, PLL,FLL	YES	8(Async)	-	85	85/0	16	T5, F10
[1,2]	MKL82Z128VMP7	72	64	MAPBGA	128	96	32	2	3	3	2(5/3)	2	-	YES	1/2	2	0/1	1/0	11/1	1	1	5	YES	8/2MHz, PLL,FLL	YES	8(Async)	-	41	41/0	16	T5, F10

Note: Please contact your local NXP representative to download the KL81 Data sheet and Reference Manual document (under NDA).

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

32-Byte Register File
64-Byte Cache
Main OSC (Oscillator crystal/resonator):
32–40 KHz/8–32 MHz

PIT (32 bit): 1 x 2 ch
Secure RTC

Footnotes
[1] USB OTG LS/FS
[2] Crystal-less USB, Device Only
[3] I²C0 modules supporting up to 1 Mbit/s

Evaluation Hardware Support for Kinetis L Series MCUs

Take your design to the next level with the Tower® System platform. Our modular development platform offers interchangeable and reusable modules along with open-source design files that offer a quick start for your customer's designs.

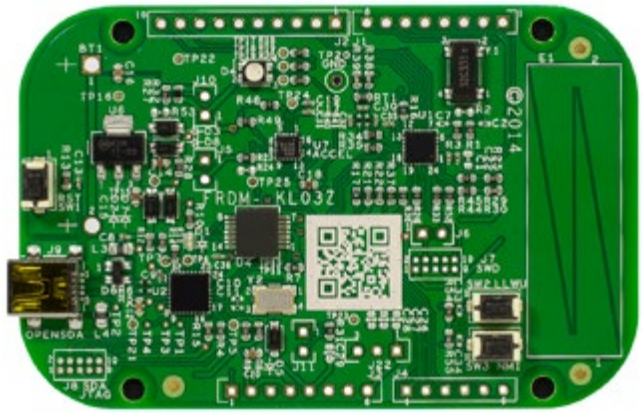
The Freedom development platform is a small, low-power, cost-effective evaluation and development system perfect for quick application prototyping and demonstration. The Freedom platform is compatible with the Arduino™ standard, enabling usage of a rich-set of third-party expansion boards. Many Freedom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

TOWER SYSTEM DEVELOPMENT BOARD

TWR-KL43Z48M

T1	**TWR-KL46Z48M**	Kinetis KL46 48 MHz MCU Tower System Module
T2	**TWR-KL43Z48M**	Kinetis KL43 48 MHz MCU Tower System Module
T3	**TWR-KL25Z48M**	Kinetis KL25 48 MHz MCU Tower System Module
T4	**TWR-KL28Z**	Kinetis KL28 72MHz MCU Tower System Module
T5	**TWR-KL82Z72M**	Kinetis KL28 72MHz MCU Tower System Module

FREEDOM DEVELOPMENT PLATFORM



FRDM-KL03Z

F1	**FRDM-KL02Z**	Kinetis KL02 48 MHz MCU Freedom Development Platform
F2	**FRDM–KL03Z**	Kinetis KL03 48 MHz MCU Freedom Development Platform
F3	**FRDM-KL05Z**	Kinetis KL05 48 MHz MCU Freedom Development Platform
F4	**FRDM-KL46Z**	Kinetis KL46 48 MHz MCU Freedom Development Platform
F5	**FRDM-KL43Z**	Kinetis KL43 48 MHz MCU Freedom Development Platform
F6	**FRDM-KL27Z**	Kinetis KL27 48 MHz MCU Freedom Development Platform
F7	**FRDM-KL26Z**	Kinetis KL26 48 MHz MCU Freedom Development Platform
F8	**FRDM-KL25Z**	Kinetis KL25 48 MHz MCU Freedom Development Platform
F9	**FRDM-KL28Z**	Kinetis Kl28 72 MHz MCU Freedom Development Platform
F10	**FRDM-KL82Z**	Kinetis KL82 72 MHz MCU Freedom Development Platform

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