

32-bit Microcontrollers

# Kinetis K30 Family

## Low-power MCUs with segment LCD

### Target Applications

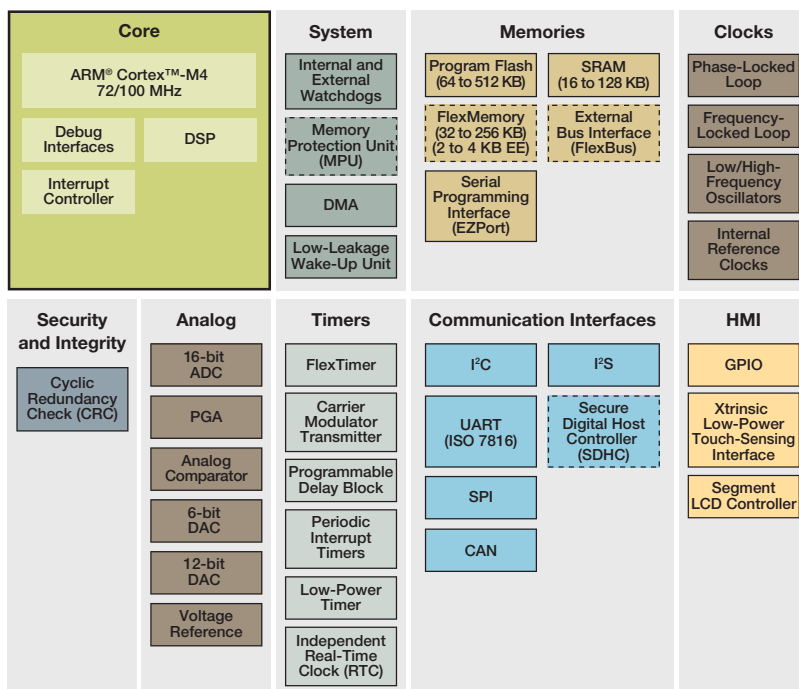
- Thermostats
- Smart meters
- Heart rate monitors
- Blood gas analyzers

### Overview

The Kinetis MCU portfolio consists of multiple pin-, peripheral- and software-compatible MCU families based on the ARM® Cortex™-M4 core. Families are built from innovative 90 nm thin-film storage (TFS) flash technology with unique FlexMemory (EEPROM) capability, and offer industry-leading low power and mixed signal analog integration.

The K30 MCU family 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 64 LQFN packages extending up to 512 KB in a 144 MAPBGA package with a rich suite of analog, communication, timing and control peripherals.

### Kinetis K30 Family



□ Standard Feature    □ Optional Feature



## One-Stop Enablement Offering—MCU + IDE + RTOS

Freescale Tower System hardware development environment:

- Integrated development environments
  - Eclipse-based CodeWarrior V10.x IDE and Processor Expert
  - IAR Embedded Workbench
  - Keil MDK
  - CodeSourcery Sourcery G++ (GNU)
- Runtime software and RTOS
  - Math, DSP and encryption libraries
  - Motor control libraries
  - Complimentary bootloaders (USB, Ethernet, RF, serial)
  - Complimentary Freescale embedded GUI
  - Complimentary Freescale MQX™
  - Cost-effective Nano™ SSL/Nano™ SSH for Freescale MQX RTOS
  - Micrium µC/OS-III
  - Express Logic ThreadX
  - SEGGER embOS
  - freeRTOS
  - Mocana (security)
- Full ARM® ecosystem

Features	Benefits
<ul style="list-style-type: none"> <li>• ARM® Cortex™-M4 core with DSP instruction support</li> <li>• Up to 16-channel DMA. Cross bar switch</li> </ul>	<ul style="list-style-type: none"> <li>• Up to 100 MHz core supporting a broad range of processing bandwidth needs</li> <li>• Peripheral and memory servicing with reduced CPU loading</li> <li>• Concurrent multi-master bus accesses for increased bus bandwidth</li> </ul>
<ul style="list-style-type: none"> <li>• Flexible, low-power LCD controller with support for up to 320 segments (40x8 or 44x4)</li> </ul>	<ul style="list-style-type: none"> <li>• LCD blink mode enables low average power while remaining in low-power mode</li> <li>• Segment fail detect guards against erroneous readouts and reduces LCD test costs</li> <li>• Frontplane/backplane reassignment provides pin-out flexibility, easing PCB design and allows LCD configuration changes via firmware with no hardware re-work</li> <li>• Supports multiple 3V and 5V LCD panel sizes with fewer segments (pins) than competitive controllers and no external components</li> <li>• Unused LCD pins can be configured as other GPIO functions</li> </ul>
<ul style="list-style-type: none"> <li>• Low-power capacitive touch-sensing interface</li> </ul>	<ul style="list-style-type: none"> <li>• Provide a modern upgrade from mechanical to touch keypad, rotary and slider user interfaces and operates in all low-power modes with minimal current added. Supports up to 16 inputs</li> </ul>
<ul style="list-style-type: none"> <li>• 10 ultra low-power modes with flash programming and analog operation down to 1.71V</li> <li>• Low-power timer, low-power RTC, low-leakage wake-up unit</li> </ul>	<ul style="list-style-type: none"> <li>• Peripheral activity and wake-up times can be optimized to suit application requirements, enabling extended battery life (Stop currents of &lt;500 nA, run currents of &lt;200 µA/MHz, 4 µs wake-up from Stop)</li> <li>• Continual device operation in reduced power states with flexible wake-up options</li> </ul>
<ul style="list-style-type: none"> <li>• Memory protection unit</li> <li>• Hardware cyclic redundancy check engine</li> <li>• Independent-clocked COP. External watchdog monitor</li> </ul>	<ul style="list-style-type: none"> <li>• Provides memory protection for all cross bar switch masters, increasing software reliability</li> <li>• Validates memory contents and communication data, increasing system reliability</li> <li>• Prevents code runaway in fail-safe applications. Drives output pin to safe state external components if watchdog event occurs</li> </ul>
<ul style="list-style-type: none"> <li>• 64 KB–512 KB flash. Up to 128 KB of SRAM</li> <li>• 32 KB–256 KB FlexMemory</li> </ul>	<ul style="list-style-type: none"> <li>• High reliability, fast access program memory with 4-level security protection. Independent flash banks allow concurrent code execution and firmware updating</li> <li>• FlexMemory provides 32B–4 KB of user-segmentable byte write/erase EEPROM. In addition, FlexNVM 32–256 KB for extra program code, data or EEPROM backup</li> </ul>

## K30 Family Options

Part Number	Memory				Features							Packages								
	CPU (MHz)	Flash (KB)	Flex NVM (KB)	SRAM (KB)	Memory Protection Unit	CAN	Secure Digital Host Controller	External Bus Interface	12-bit DAC	Prog. Gain Amplifier	5V Tolerant I/O	Other	LH	LK	MB	LL	ML	MC	LQ	MD
													64LQFP (10X10)	80LQFP (12X12)	81BGA (8X8)	100LQFP (14X14)	104BGA (8X8)	121BGA (8X8)	144LQFP (20X20)	144BGA (13X13)
MK30DN512Vyy10	100	512		128	✓	✓	✓	*	✓	✓	✓	Segment LCD (up to 40x8/44x4)		✓	✓	✓		✓	✓	✓
MK30DX64Vyy7	72	64	32	16		✓			✓	✓	✓	Segment LCD (up to 24x8/28x4)	✓	✓	✓					
MK30DX128Vyy7	72	128	32	32		✓			✓	✓	✓	Segment LCD (up to 38x8/42x4)	✓	✓	✓	✓	✓			
MK30DX256Vyy7	72	256	32	64		✓			✓	✓	✓	Segment LCD (up to 38x8/42x4)		✓	✓	✓	✓			
MK30DX128yy10	100	128	128	32	✓	✓	✓	✓	✓	✓	✓	Segment LCD (up to 40x8/44x4)							✓	✓
MK30DX256yy10	100	256	256	64	✓	✓	✓	✓	✓	✓	✓	Segment LCD (up to 40x8/44x4)							✓	✓

yy = package designator

\*144pin only

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