Low-power MCUs with graphics LCD, connectivity and security

Kinetis® K70 Family

Based on the ARM® Cortex®-M4 core, the low-power Kinetis K70 MCU family includes a rich suite of peripherals and a comprehensive enablement environment for superior performance and a short time-to-market.

TARGET APPLICATIONS

- Industrial control panels
- Navigational displays
- Point-of-sale terminals
- Medical monitoring equipment

Kinetis MCUs 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.

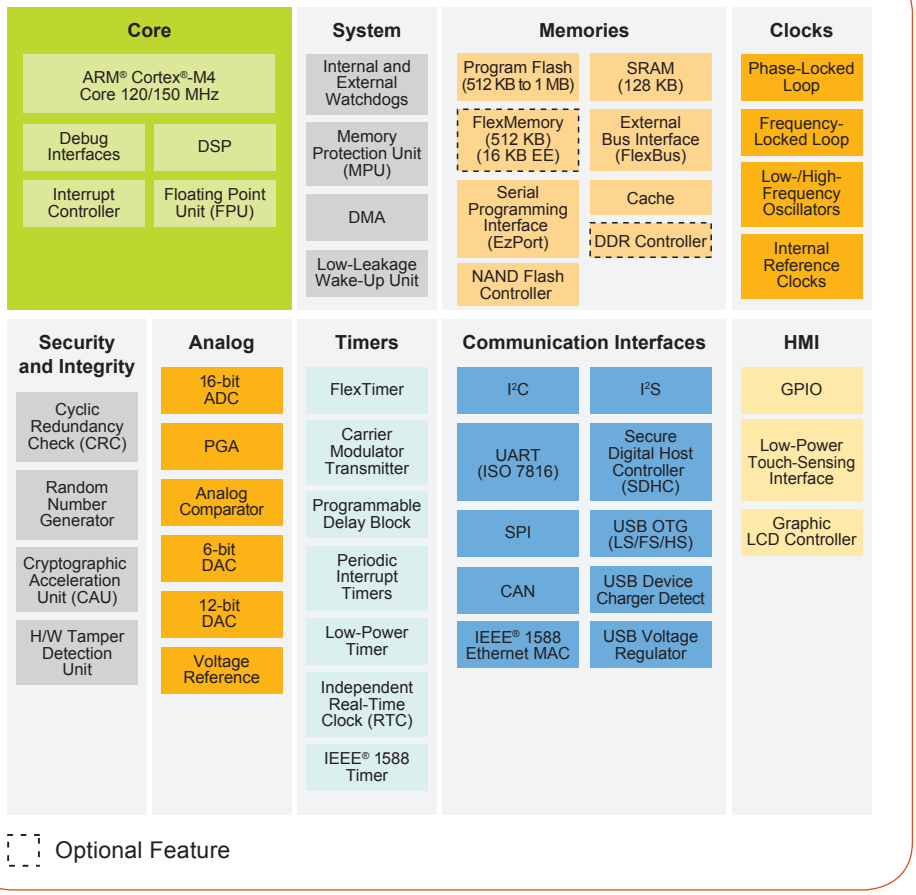
The K70 MCU family includes an integrated graphics LCD controller, IEEE® 1588 Ethernet MAC, Full- and high-speed USB 2.0 On-The-Go with device charger detect capability, hardware encryption and tamper detection capabilities. The K70 is available with 512 KB or 1 MB of flash in 256-pin MBGA packages. 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.

ONE-STOP ENABLEMENT OFFERING—MCU + IDE + RTOS

- Tower® System and Freedom development board platforms
- Integrated development environments
  - Eclipse-based CodeWarrior® V10.1 IDE and Processor Expert® software configuration tool
  - IAR Embedded Workbench®
  - ARM Keil® tool
  - Kinetis Design Studio IDE
  - SOMNIUM® DRT Cortex-M IDE

- Runtime software and RTOS
  - Portable embedded GUI (PEG) development tools
  - Math, DSP and encryption libraries
  - Motor control libraries
  - Complimentary bootloaders (USB, Ethernet, RF, serial)
  - MQX™ RTOS
  - Cost-effective Nano™ SSL/Nano™
  - Micrium® µC/OS-III
  - Express Logic ThreadX®
  - SEGGER embOS®
  - FreeRTOS™
- Full ARM ecosystem

KINETIS K70 FAMILY BLOCK DIAGRAM



K70 FAMILY OPTIONS

Part Number	Memory					Features									Other	Packages
	CPU (MHz)	Flash (KB)	Flex NVM (KB)	SRAM (KB)	Cache (KB)	Single Precision	Memory Protection Unit	CAN	Secure Digital Host Controller	External Bus Interface	NAND Flash Controller	12-bit DAC	Programmable Gain Amplifier	5 V Tolerant I/O		256 6BGA (17 x 17 mm) MJ
MK70FN1M0Vyy12	120	1MB		128	16	√	√	√	√	√	√	√	√	√	Graphics LCD, USB OTG (FS/HS), IEEE 1588 Ethernet, Encryption, HW Tamper Detect, *DDR Controller	√
MK70FN1M0Vyy15	150	1MB		128	16	√	√	√	√	√	√	√	√	√	Graphics LCD, USB OTG (FS/HS), IEEE 1588 Ethernet, Encryption, HW Tamper Detect, *DDR Controller	√
MK70FX512Vyy12	120	512	512	128	16	√	√	√	√	√	√	√	√	√	Graphics LCD, USB OTG (FS/HS), IEEE 1588 Ethernet, Encryption, HW Tamper Detect, *DDR Controller	√
MK70FX512Vyy15	150	512	512	128	16	√	√	√	√	√	√	√	√	√	Graphics LCD, USB OTG (FS/HS), IEEE 1588 Ethernet, Encryption, HW Tamper Detect, *DDR Controller	√

Features	Benefits
• Cortex-M4 core with DSP instruction support and optional single precision floating point unit • Up to 32-channel DMA • Up to 16 KB cache • Cross bar switch	• Up to 150 MHz core supporting a broad range of processing bandwidth needs • Peripheral and memory servicing with reduced CPU loading • Optimized bus bandwidth and flash execution performance • Concurrent multi-master bus accesses for increased bus bandwidth
• Graphics LCD controller • Low-power capacitive touch-sensing	• Support for color QVGA displays as single chip or up to 24-bit SVGA displays using external memory • Supported by our proprietary Portable Embedded GUI (PEG) Library with simple WindowBuilder interface for powerful GUI development • Provides 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
• Hardware encryption coprocessor • Hardware tamper detection • Memory protection unit • Hardware cyclic redundancy check engine • Independent clocked COP with external watchdog monitor	• Secure data transfer and storage • Faster than software implementations and with minimal CPU loading • Supports a wide variety of algorithms: DES, 3DES, AES, MD5, SHA-1, SHA-256 • Secure real-time clock with independent battery supply • Secure key storage with internal/external tamper detect for unsecure flash, temperature/clock/supply voltage variations and physical attack • Provides memory protection for all cross bar switch masters, increasing software reliability • Validates memory contents and communication data, increasing system reliability • Prevents code runaway in fail-safe applications • Drives output pin to safe state external components if watchdog event occurs
• USB On-The-Go (Full- and high-speed) with device charger detect • IEEE® 1588 Ethernet MAC with HW time stamping • Up to six UARTS with IrDA support; one UART with ISO 7816 support • I^2S interface; up to two CAN modules, up to three DSPI and up to two I2C interfaces	• Optimized charging current/time for portable USB devices, enabling longer battery life • USB low-voltage regulator supplies up to 120 mA off chip at 3.3 V to power external components from 5 V input • Precision clock synchronization for real-time, networked industrial automation and control • Variety of data size, format and transmission/reception settings supported for multiple industrial communication protocols • Multiple communication interfaces for simple and efficient data exchange, industrial network bridging and audio system interfacing
• FlexBus external bus interface • Secure digital host controller • NAND flash controller • DRAM controller	• Enables the connection of external memories and peripherals (e.g., graphics displays) • Connection to SD, SDIO, MMC or CE-ATA cards for in-application software upgrades, file systems or adding Wi-Fi® or Bluetooth® support • Supports up to 32-bit ECC current and future NAND types with minimal software overhead • Supports connection of DDR, DDR2 and low-power DDR memories
• 32 KB–1 MB flash; up to 128 KB of SRAM • 32 KB–512 KB FlexMemory	• High reliability, fast access program memory with four levels of security protection. Independent flash banks allow concurrent code execution and firmware updating • FlexMemory provides 32 bytes–16 KB of user-segmentable byte write/erase EEPROM; in addition, Flex NVM from 32 KB–512 KB for extra program code, data or EEPROM backup

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