32-bit Microcontrollers

ColdFire+ Microcontrollers

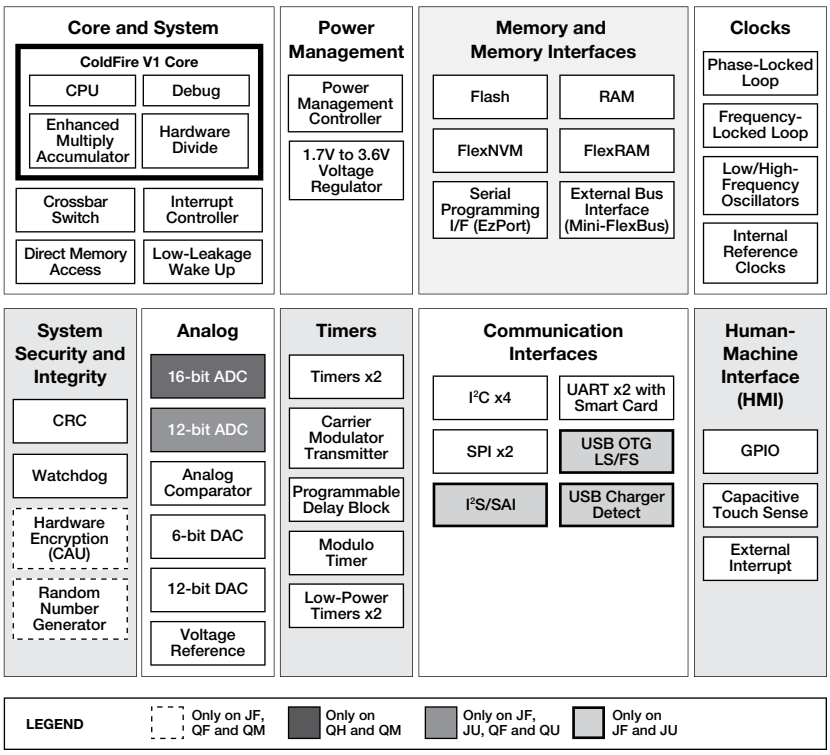
Design Innovation. Accelerated.

Overview

Freescale's ColdFire+ 32-bit microcontrollers (MCUs) are built from the ColdFire V1 core and enabled by innovative 90 nm thin-film storage (TFS) flash technology with 32 KB of FlexMemory (2 KB of EEPROM). The portfolio is defined by six families that scale from 32 KB to 128 KB of flash, featuring incredible ultra-low-power capabilities in small footprint solutions. ColdFire+ MCUs offer a rich combination of additive peripherals, including USB, high-performance mixed-signal, hardware encryption, an innovative touch-sensing interface (TSI) and more. These key features make ColdFire+ MCUs ideal for portable hand-held devices, wireless nodes, peripherals that require device authentication, building control security pads and advanced remote control devices.

The six scalable ColdFire+ families consist of the MCF51QU, MCF51QH, MCF51QF and MCF51QM as well as the MCF51JU and MCF51JF devices. All families are software and pin-to-pin compatible and designed to maximize code re-use and shorten development time and investment.

ColdFire+ Jx/Qx Families



freescale™
ColdFire+

ColdFire+ Qx Family

An incredibly cost-effective, ultra-low-power, mixed-signal microcontroller family ideal for secure portable or battery-powered applications.

Target applications

- Wireless sensor nodes
- Security control pads
- Video game accessories

MCF51QH 16-bit ADC	**MCF51QM** Encryption 16-bit ADC
MCF51QU 12-bit ADC	**MCF51QF** Encryption 12-bit ADC

ColdFire+ Jx Family

Ideal for portable consumer devices, the ColdFire+ Jx family adds USB OTG capability and a synchronous audio interface to the ColdFire+ Qx family.

Target applications

- Smart phone accessories
- USB audio bridges
- PC peripherals
- High-end remote controls

MCF51JU USB OTG 12-bit ADC	**MCF51JF** USB OTG 12-bit ADC Encryption

Software and Development Tools

ColdFire+ MCUs offer one of the most comprehensive enablement bundles in the industry. Software and development tools include the Freescale Tower System TWR-MCF51QM and TWR-MCF51JF, a rapid-prototyping hardware development tool, complimentary MQX™ 3.7 RTOS with USB stacks and USB audio support available with full source code, as well as the Eclipse™ based CodeWarrior Development Studio for Microcontrollers V10.1 IDE with Processor Expert.

Features	Benefits
Innovative FlexMemory: Configurable as EEPPROM or flash	• Eliminates the need for external EEPROM with over 4M write/erase cycles
Ten flexible ultra-low-power modes	• Run current down to 260 uA/MHz • 4 µs wake up time • Stop currents ≈1 uA
Security and reliability	• Crypto acceleration unit (CAU) and random number generator (RNG) accelerate secure communication and device authentication • 32-bit hardware CRC included for system/software reliability
Integrated capacitive touch sensing and display support	• Low-power touch-sensing interface (TSI) allows wake-up from touch in lowest power modes • External bus interface to seamlessly connect to graphical displays
Flexible and powerful mixed signal capability	• 16-bit ADC enables highly accurate measurements for instrumentation, metering and medical devices • Integrated 12-bit DAC, high-speed comparator and voltage reference to reduce system costs
Designed for space-constrained applications	• Package sizes as small as 5 x 5 mm
Connect via USB for battery charging (Jx Only)	• Integrated USB 2.0 full-speed device/host/OTG controller with integrated transceiver and USB voltage regulator • Includes device charge detector (DCD) and regulator to support battery charging via USB for portable devices
Enable audio in your application (Jx Only)	• Synchronous audio interface provides direct interface to codecs and I²S audio devices • 48-bit enhanced multiply accumulate (EMAC) unit offers powerful signal processing capability

64 LQFP (10 x 10)	48 LQFP (7 x 7)	44 Laminate QFN PGA (5 x 5)	64 Laminate QFN PGA (9 x 9)	32 QFN (5 x 5)
128 KB Flash	64 KB Flash	32 KB, 64 KB and 128 KB Flash	128 KB Flash	32 KB Flash
MCF51QU128VLH	MCF51QU64VLF	MCF51QU128VHS MCF51QU64VHS MCF51QU32VHS	MCF51QU128VHX	MCF51QU32VFM
MCF51QH128VLH	MCF51QH64VLF	MCF51QH128VHS MCF51QH64VHS MCF51QH32VHS	MCF51QH128VHX	MCF51QH32VFM
MCF51QF128VLH	MCF51QF64VLF	MCF51QF128VHS MCF51QF64VHS MCF51QF32VHS	MCF51QF128VHX	MCF51QF32VFM
MCF51QM128VLH	MCF51QM64VLF	MCF51QM128VHS MCF51QM64VHS MCF51QM32VHS	MCF51QM128VHX	MCF51QM32VFM
MCF51JU128VLH	MCF51JU64VLF	MCF51JU128VHS MCF51JU64VHS MCF51JU32VHS	MCF51JU128VHX	MCF51JU32VFM
MCF51JF128VLH	MCF51JF64VLF	MCF51JF128VHS MCF51JF64VHS MCF51JF32VHS	MCF51JF128VHX	MCF51JF32VFM

Learn more: For current information about Freescale products and documentation, please visit **freescale.com/ColdFire+**.

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