



Flexis 32-bit Microcontrollers

## MCF51JE256/128

### Ultra-low-power MCU with USB connectivity



#### Target Applications

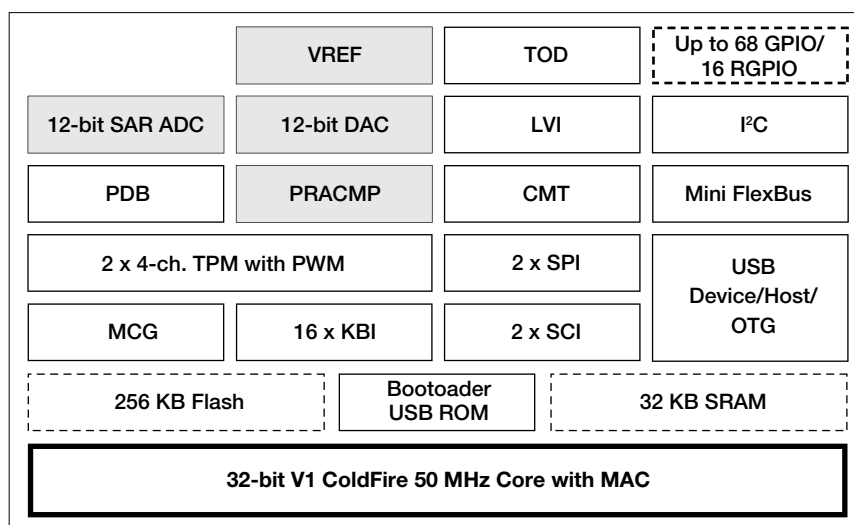
- HVAC building control systems
- PC peripherals
- Lighting control systems
- Industrial networking products
- Portable medical devices

#### Overview

The MCF51JE256/128 (JE256/128) provides ultra-low-power operation, USB connectivity and high measurement accuracy, all in a single 32-bit microcontroller, allowing designers to develop a more fully featured system at a lower cost. The JE256/128 integrates high-resolution ADC and DAC modules and a rich peripheral set including a USB 2.0 host/device/OTG controller, multiple serial interfaces and an external bus interface.

The JE256/128 is part of the Freescale Flexis microcontroller series, which includes both 8-bit S08 and 32-bit V1 ColdFire microcontrollers that have a common set of peripherals and development tools to deliver the ultimate in migration flexibility. The JE256/128 family is also easy to use. Freescale provides a comprehensive suite of development tools and software to help developers design quickly and easily.

#### MCF51JE256 Block Diagram



#### Modular Tower Development System

**TWR-MCF51JE-KIT (\$119 USD\*)**

**TWR-MCF51JE (\$69 USD\*)**

The Freescale Tower development system provides the user with a modular, reconfigurable demonstration and development platform.

The TWR-MCF51JE-KIT soldered with 100LQFP MCF51JE256 consists of:

- TWR-MCF51JE stand-alone development board
- TWR-SER serial boards that support USB and RS232
- TWR-ELEV elevator board that connects the MCU and serial boards
- USB cable

The TWR-MCF51JE can also be ordered independently. A getting-started DVD included with the board includes necessary software, documents and resources to jumpstart new product development.

**CodeWarrior Development Studio for Microcontrollers v6.3/10.x**

**Special Edition (Complimentary\*\*)**

CodeWarrior Development Studio for Microcontrollers is an integrated tool suite that supports software development for Freescale’s microcontrollers. Designers can further accelerate application development with the help of the award-winning Processor Expert tool in the CodeWarrior tool suite.

**Freescale MQX RTOS and USB Software Stack (complimentary\*\*)**

With the powerful integration of JE256/128 family, Freescale provides full production source code of Freescale MQX software:

- RTOS: Full priority-based, pre-emptive scheduler
- USB host/device
- MS-DOS file system (MFS)

**Product Selector Guide**

Part Number	Temp. Ranges	Package
MCF51JE256CML	-40°C to +85°C	104 MAPBGA
MCF51JE256CLL	-40°C to +85°C	100 LQFP
MCF51JE256CMB	-40°C to +85°C	81 MAPBGA
MCF51JE256CLK	-40°C to +85°C	80 LQFP
MCF51JE128CMB	-40°C to +85°C	81 MAPBGA
MCF51JE128CLK	-40°C to +85°C	80 LQFP
MCF51JE256VML	-40°C to +105°C	104 MAPBGA
MCF51JE256VLL	-40°C to +105°C	100 LQFP
MCF51JE256VMB	-40°C to +105°C	81 MAPBGA
MCF51JE256VLK	-40°C to +105°C	80 LQFP
MCF51JE128VMB	-40°C to +105°C	81 MAPBGA
MCF51JE128VLK	-40°C to +105°C	80 LQFP

Features	Benefits
<b>CPU and System Configuration</b>	
<ul style="list-style-type: none"> <li>• 32-bit V1 ColdFire CPU Offering 46 MIPS at 50 MHz</li> <li>• 1.8V to 3.6V single supply</li> </ul>	<ul style="list-style-type: none"> <li>• Offers high performance across the entire voltage range</li> </ul>
<b>On-Chip Memory</b>	
<ul style="list-style-type: none"> <li>• Up to 256 KB flash</li> <li>• Up to 32 KB SRAM</li> <li>• Mini FlexBus (external bus interface)</li> </ul>	<ul style="list-style-type: none"> <li>• Allows the user to take full advantage of in-application re-programmability benefits in any environment</li> <li>• Security circuitry helps to prevent unauthorized RAM access</li> <li>• Glueless connection to external memory devices</li> </ul>
<b>Power Management</b>	
<ul style="list-style-type: none"> <li>• Low-power operation mode</li> </ul>	<ul style="list-style-type: none"> <li>• Low-power Stop 2 current: 550 nA with 32K of SRAM enabled and active POR</li> <li>• 6 uS wake-up time from Stop 3</li> <li>• 32 kHz oscillator for low-power time keeping</li> <li>• Rapid response to interrupts from the low-power sleep mode</li> </ul>
<b>Analog Related Peripherals</b>	
<ul style="list-style-type: none"> <li>• 12-bit ADC</li> <li>• 12-bit DAC</li> <li>• Programmable delay block</li> <li>• VREF (voltage reference)</li> </ul>	<ul style="list-style-type: none"> <li>• High-resolution and high-accuracy ADC provides accurate signal acquisition</li> <li>• Digital-to-analog converter with clock gating optimized for low-power usage</li> <li>• PDB precisely triggers ADC and DAC blocks to complete sensor biasing and measurement (i.e. glucometry strips)</li> <li>• VREF accuracy is 33 ppm/°C from 0 °C to 50°C</li> </ul>
<b>Communication Peripherals</b>	
<ul style="list-style-type: none"> <li>• USB 2.0 controller</li> <li>• Dual asynchronous SCIs</li> <li>• Inter IC-BUS (I<sup>2</sup>C)</li> <li>• Dual synchronous SPI (1 x 64-bit FIFO SPI)</li> </ul>	<ul style="list-style-type: none"> <li>• USB device/host/On-The-Go controller</li> <li>• On-chip transceiver and 3.3 volt regulator reduces system cost</li> <li>• Serial communication interface provides a simple, efficient method of data exchange between devices. Option to connect analog comparator to SCI for opto-isolation applications</li> <li>• I<sup>2</sup>C port enables increased system memory by using an additional I<sup>2</sup>C EEPROM</li> <li>• Two SPIs allow two separate dedicated devices, for example, one SPI dedicated to a ZigBee® transceiver and the other to MCUs or peripherals. SPI FIFO allows better performance to drive a graphic LCD.</li> </ul>
<b>Software and Tools</b>	
<ul style="list-style-type: none"> <li>• Background debug mode (BDM) for in-circuit debugging</li> <li>• Complimentary Freescale MQX software solutions, RTOS, USB, file system and strong third-party alliance network</li> <li>• Medical applications USB stack</li> <li>• Tower development system</li> </ul>	<ul style="list-style-type: none"> <li>• Real-time trace and debug support</li> <li>• Value added tools and software, stacks and RTOS</li> <li>• Standardize with the “Continua Ready” personal health care device (PHDC) USB solution</li> <li>• The Freescale Tower System is a modular, reconfigurable demonstration and development platform</li> </ul>

As other USB MCUs from Freescale, the JE256/128 devices are supported by USB stack with MSD, HID, CDC and PHDC classes. This USB stack can also be used for medical applications.

\* Prices indicated are MSRP

\*\* Subject to license agreement

**Learn more:** For current information about Freescale products and documentation, please visit [freescale.com/MCF51JE](http://freescale.com/MCF51JE).



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### Наши контакты:

**Телефон:** +7 812 627 14 35

**Электронная почта:** [sales@st-electron.ru](mailto:sales@st-electron.ru)

**Адрес:** 198099, Санкт-Петербург,  
Промышленная ул, дом № 19, литера Н,  
помещение 100-Н Офис 331