

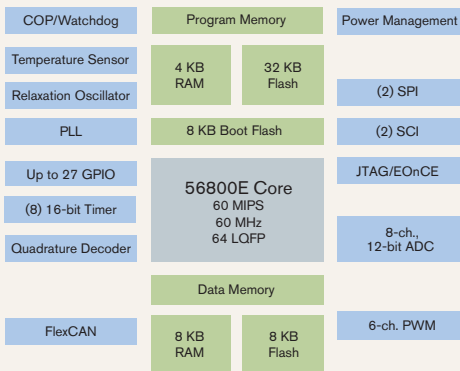
# 56F8323

## Target Applications

- > Automotive control
- > Industrial control/networking
- > Motion control
- > Home appliances
- > General-purpose inverters
- > Smart sensors
- > Fire and security systems
- > Power management
- > Medical monitoring

## Overview

The 56F8323 extends the capabilities introduced by the 56F8322 by adding additional analog-to-digital converter (ADC) inputs and timer input/output pins, among other enhancements. This device also features 60 MIPS (at 60 MHz) performance along with 48 KB of on-chip Flash memory and a comprehensive assortment of sophisticated peripherals, all in a 64-pin LQFP package. The 56F8323 is perfectly suited for applications requiring the computational power of a signal processor and the knack for “bit banging” of an embedded controller. The 56F8323 can operate at extended temperatures (up to +125°C) without losing a step. In other words, you now have at your disposal the performance and functionality demanded by your application, which will be used in a harsh environment.



## 56800E Core Features

- > Up to 60 MIPS at 60 MHz execution frequency
- > DSP and microcontroller (MCU) functionality in a unified, C-efficient architecture
- > JTAG/enhanced on-chip emulation (EOnCE™) for unobtrusive, real-time debugging
- > Four 36-bit accumulators
- > 16- and 32-bit bidirectional barrel shifter
- > Parallel instruction set with unique addressing modes
- > Hardware DO and REP loops available
- > Three internal address buses
- > Four internal data buses
- > Architectural support for 8-, 16- and 32-bit single-cycle data fetches
- > MCU-style software stack support
- > Controller-style addressing modes and instructions
- > Single-cycle 16 x 16-bit parallel multiplier-accumulator (MAC)
- > Proven to deliver more control functionality with a smaller memory footprint than competing architectures

## Benefits

- > Hybrid architecture facilitates implementation of both control and signal processing functions in a single device
- > High-performance, secured Flash memory helps eliminate the need for external storage devices
- > Extended temperature range allows for operation of nonvolatile memory in harsh environments
- > Flash memory emulation of EEPROM helps eliminate the need for external nonvolatile memory
- > 32-bit performance with 16-bit code density
- > On-chip voltage regulator and power management help reduce overall system cost
- > Internal relaxation oscillator helps eliminate the need for external crystal
- > This device boots directly from Flash, providing additional application flexibility
- > High-performance pulse-width modulation (PWM) with programmable fault capability simplifies design and promotes compliance with safety regulations
- > PWM and ADC modules are tightly coupled to help reduce processing overhead
- > Low-voltage interrupts (LVIs) help protect the system from brownout or power failure
- > Simple in-application Flash memory programming via EOnCE or serial communication

### 56F8323 Memory Features

- > Architecture permits as many as three simultaneous accesses to program and data memory
- > On-chip memory includes high-speed volatile and nonvolatile components:
  - 48 KB On-chip Flash
    - › 32 KB of Program Flash
    - › 8 KB of Data Flash
    - › 8 KB of Boot Flash
  - 4 KB of Program RAM
  - 8 KB of Data RAM
- > Memories operate at 60 MHz (zero wait states) over temperature range (-40°C to +125°C) with no software tricks or hardware accelerators required
- > Flash security feature helps prevent unauthorized accesses to its content

### 56F8323 Peripheral Circuit Features

- > One PWM module with six outputs and three programmable fault inputs
- > Two serial peripheral interfaces (SPIs)
- > Two serial communications interfaces (SCIs)
- > I<sup>2</sup>C communications master mode (emulated)
- > Eight 16-bit timers with input and output compare capability
- > One four-input quadrature decoder
- > FlexCAN module, 2.0 A/B compatible
- > Temperature sense diode to monitor the on-chip temperature
- > On-chip 3.3V to 2.6V voltage regulator
- > Software-programmable Phase-Lock Loop (PLL)
- > On-chip relaxation oscillator
- > 12-bit ADCs with eight inputs, self-calibration and current injection capability
- > Up to 27 general-purpose input/output (GPIO) pins
- > External reset input pin for hardware reset
- > Computer operating properly (COP)
- > Integrated power-on reset and LVI module

### Product Documentation

<b>56F8300 Peripheral User Manual</b>	Detailed peripheral descriptions of the 56F8300 family of devices <b>Order Number:</b> MC56F8300UM
<b>56F8323/56F8123 Technical Data Sheet</b>	Electrical and timing specifications, device-specific peripheral information, and package and pin descriptions <b>Order Number:</b> MC56F8323
<b>56F8323 Product Brief</b>	Summary description and block diagram of the 56F8323 core, memory, peripherals and interfaces <b>Order Number:</b> MC56F8323PB
<b>DSP56800E Reference Manual</b>	Detailed description of the DSP56800E architecture, 16-bit core processor and the instruction set <b>Order Number:</b> DSP56800ERM

### Award-Winning Development Environment

- > Processor Expert™ (PE) technology provides a rapid application design (RAD) tool that combines easy-to-use, component-based software application creation with an expert knowledge system.
- > The CodeWarrior™ Integrated Development Environment (IDE) is a sophisticated tool for code navigation, compiling and debugging. A comprehensive set of evaluation modules (EVMs) and development system cards will support concurrent engineering. Together, PE technology, the CodeWarrior tool suite and EVMs create a comprehensive, scalable tools solution for easy, fast and efficient development.

### Ordering Information

<b>Part</b>	MC56F8323
<b>Package Type</b>	Low-Profile Quad Flat Pack (LQFP)
<b>Pin Count</b>	64
<b>Temperature Range</b>	-40°C to +105°C
<b>Order Number</b>	MC56F8323VFB60

<b>Part</b>	MC56F8323
<b>Package Type</b>	Low-Profile Quad Flat Pack (LQFP)
<b>Pin Count</b>	64
<b>Temperature Range</b>	-40°C to +125°C
<b>Order Number</b>	MC56F8323MFB60

**Learn More:** For more information about Freescale products, please visit [www.freescale.com](http://www.freescale.com).