



## MC56F8006/2

### 16-Bit Digital Signal Controller

The devices in the MC56F8006/2 series combine, on a single chip, the processing power of a Digital Signal Processor (DSP) and the functionality of a Microcontroller Unit (MCU) with a flexible set of peripherals to create an extremely cost-effective solution.

The MC56F8006/2 series uses the 56800E core, which is based on a dual Harvard-style architecture consisting of three execution units operating in parallel. This allows as many as six operations per instruction cycle. The MCU-style programming model and optimized instruction set allow straightforward generation of efficient, compact DSP and control code. The instruction set is also highly efficient for C compilers to enable rapid development of optimized control applications.

A full set of programmable peripherals supports various applications. Any signal pin associated with these peripherals can also be configured as a General-Purpose Input/Output (GPIO). Power-saving features include a very low-power mode and the ability to shut down each peripheral independently. The MC56F8006/2 series adds enhanced features to Freescale's digital signal controller portfolio with low standby, stop, and run current and an extended operating voltage range of 1.8V to 3.6V. The MC56F8006/2 series can enable power-sensitive devices with a fast wake-up time from stop mode, a very low-power crystal oscillator, and AD/converter modules with lower run current.

The MC56F8006/2 series also offers a specific integrated peripheral set to improve the performance of motor control, power conversion and power-sensitive applications, reducing both external component count and overall system costs. The peripheral mix includes two programmable gain amplifiers, three high-speed comparators, RTC, dual 12-bit A/D converters, up to six PWM outputs, and various serial communication peripherals and timers.

#### Features

- Single-cycle 16 x 16-bit parallel Multiplier-Accumulator (MAC)
- Four 36-bit accumulators, including extension bits
- Two 2 x 16-bit Programmable Gain Amplifiers (PGAs)
- Three analog comparators
- Two 12-bit A/D converters
- Six output PWM with programmable fault capability
- Two 16-bit timers
  - One 16-bit periodic interval timer
  - Programmable timer
- Low-power operation
  - Nine different power modes

#### Applications

- Industrial control
- Home appliances
- Smart sensors
- Fire and security
- SMPS and power management
- Power metering
- Motor control
- Medical portable diagnostic and therapeutic devices
- Instrumentation
- Lighting ballast

#### Development Tools

##### MC56F8006DEMO

Cost-effective demonstration board allows easier and faster development, including USB interface channel, user LEDs, user push button switches, daughter card connectors, and a JTAG interface.

##### MC56F8006DEMO-T

Cost-effective development set, with demonstration board, including USB interface channel, user LEDs, user push button switches, daughter card connectors, and JTAG interface, plus a USB TAP, enables a convenient design experience.

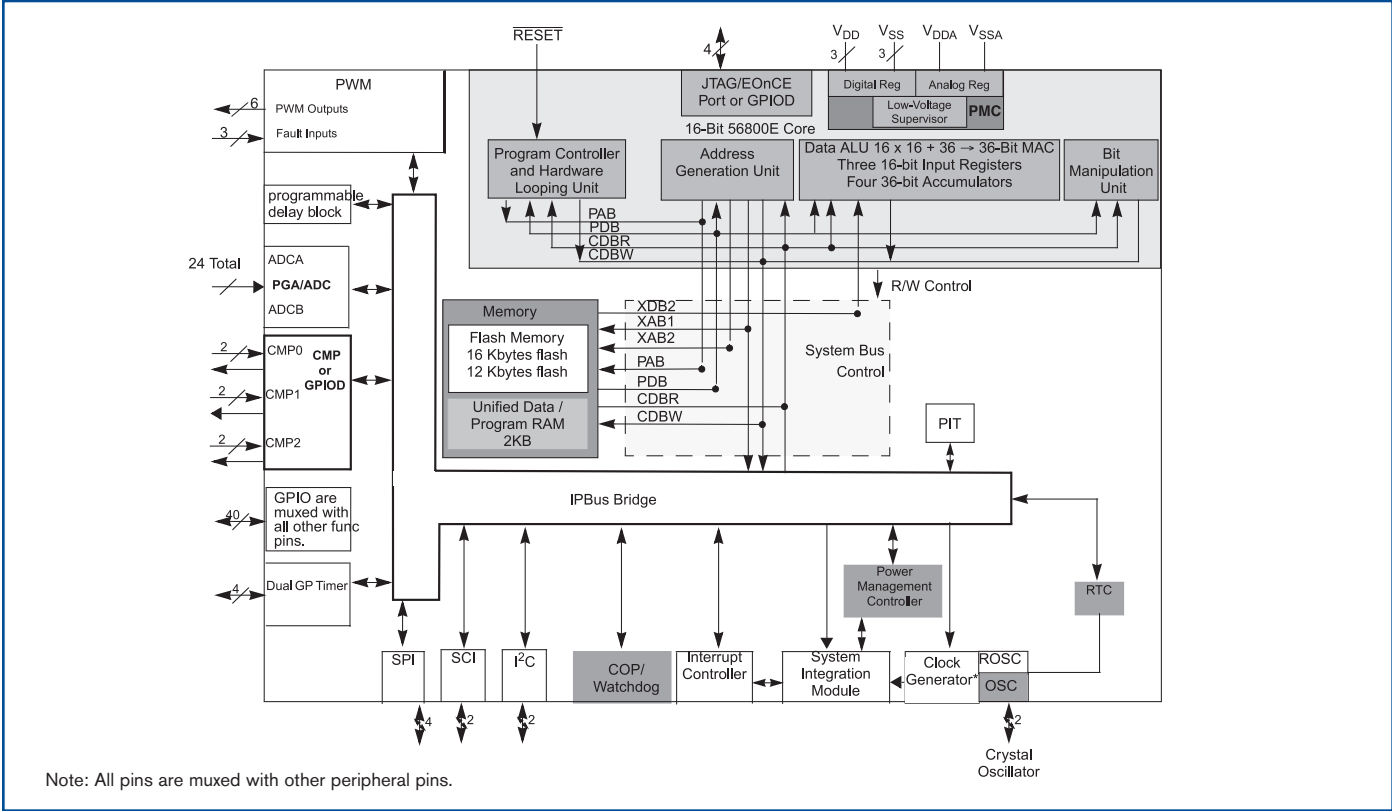
##### CWH-UTP-ONCE-HE

This USB TAP host target interface is a cost-effective hardware debugger tool designed for Freescale 16-bit DSC users. It is self-powered, requires no external power supply, and integrates HS USB download, Flash memory programming, and run-control visibility and control.

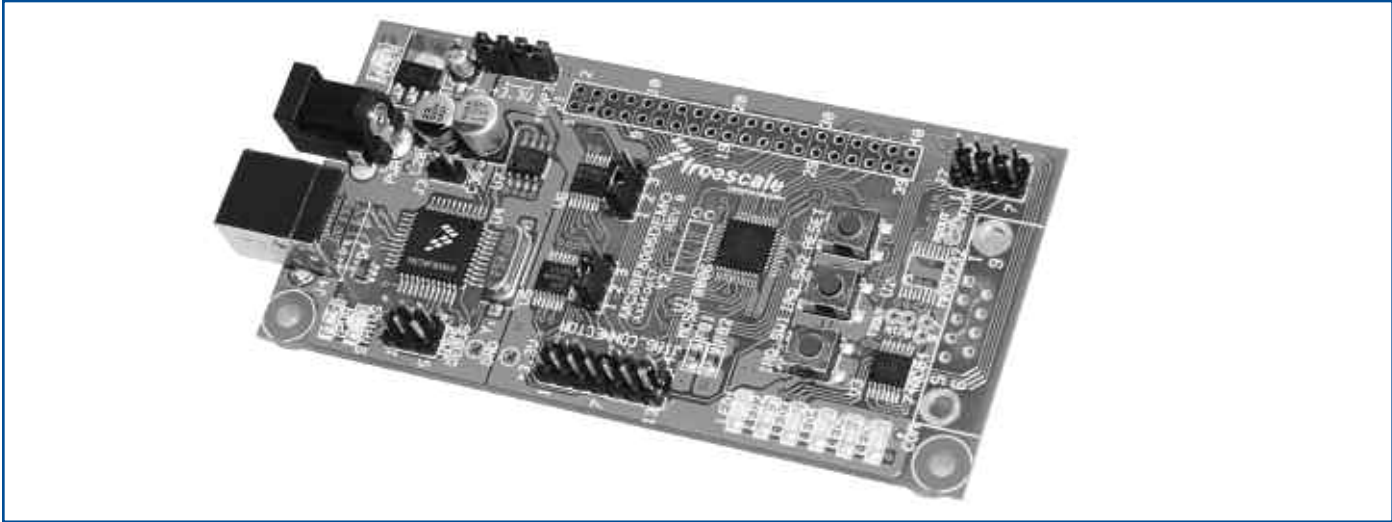
##### CWX-568-SE

CodeWarrior™ Development Studio for Freescale 56800/E Digital Signal Controllers lets 56800E designers build and deploy even the most sophisticated DSC systems quickly and easily. The embedded Processor Expert™ technology provides GUI to enable quick generation of peripheral drivers and software libraries, which frees developers from the time-consuming effort of learning low-level hardware details. This is a complementary CodeWarrior Special Edition for DSC with a 32 KB code size limit.

Top-Level Block Diagram



MC56F8006/2 Demo Board



Orderable Part Number Summary

Part Number	Flash/SRAM (KB)	Package	Temperature
MC56F8006VLF	16/2	48 LQFP	-40°C to +105°C
MC56F8006VLC	16/2	32 LQFP	-40°C to +105°C
MC56F8006VWL	16/2	28 SOIC	-40°C to +105°C
MC56F8002VWL	12/2	28 SOIC	-40°C to +105°C

For more information, such as datasheets and app notes, visit [www.arrow.com/arrowedge](http://www.arrow.com/arrowedge).