Signal Controllers

56F8367
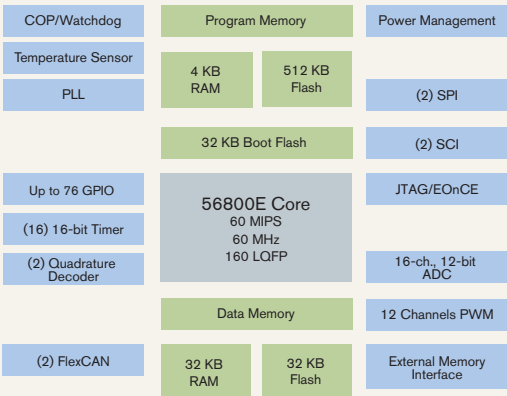
Target Applications

> Automotive control

> Industrial control/ connectivity

> Advanced motion control

> Home appliances

> General-purpose inverters

> Smart relays

> Fire and security systems

> Power management

> Medical monitoring

> Multiphase inverters

Overview

Ever wish you had just a handful of extra input/output pins available? Your wish has just come true! If your application requires a few more pins than those available in the 56F8366, the 56F8367 is the device for you. With its 576 KB of on-chip Flash memory, the 56F8367 has the same memory footprint as the 56F8366, yet provides an additional 14 digital input/output pins with its 160-pin LQFP package. You will continue to enjoy use of pulse-width modulation (PWM) outputs, analog-to-digital converter (ADC) inputs and timer channels, along with the ability to interface with other devices in your system via the external memory interface.

When you need the right mix of functionality without adding memory, the 56F8365, 56F8366 and 56F8367 devices offer you both flexibility and compatibility, making your choice a simple one.

COP/Watchdog	Program Memory	Power Management
Temperature Sensor	4 KB RAM / 512 KB Flash	
PLL		(2) SPI
	32 KB Boot Flash	(2) SCI
Up to 76 GPIO	56800E Core 60 MIPS 60 MHz 160 LQFP	JTAG/EOnCE
(16) 16-bit Timer		16-ch., 12-bit ADC
(2) Quadrature Decoder		
	Data Memory	12 Channels PWM
(2) FlexCAN	32 KB RAM / 32 KB Flash	External Memory Interface

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 eliminates the need for external storage devices

> Extended temperature range up to +125°C allows for operation of nonvolatile memory in harsh environments

> Flash memory emulation of EEPROM eliminates the need for external nonvolatile memory

> 32-bit performance with 16-bit code density

> On-chip voltage regulator and power management reduce overall system cost

> Off-chip memory expansion capabilities allow for glueless interfacing with the additional memory of external devices without sacrificing performance

> This device boots directly from Flash, providing additional application flexibility

> High-performance PWM with programmable fault capability simplifies design and promotes compliance with safety regulations

> PWM and ADC modules are tightly coupled to reduce processing overhead

> Low-voltage interrupts (LVIs) protect the system from brownout or power failure

> General-purpose input/output (GPIO) pins support application-specific needs

> Simple in-application Flash memory programming via EOnCE or serial communication

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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

- 512 KB of Program Flash
- 4 KB of Program RAM
- 32 KB of Data Flash
- 32 KB of Data RAM
- 32 KB of Boot Flash

> All 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 prevents unauthorized accesses to its content

> Off-chip memory expansion capabilities provide a simple method for interfacing additional external memory and/or peripheral devices

- Access up to 4 MB of external program memory or 32 MB of external data memory
- External accesses supported at up to 60 MHz (zero wait states)

56F8367 Peripheral Circuit Features

> Two PWM modules with 12 outputs and seven programmable fault inputs

> Two serial peripheral interfaces (SPIs)

> Two serial communications interfaces (SCIs)

> Sixteen 16-bit timers with input and output compare capability

> Two four-input quadrature decoders

> Two FlexCAN 2.0 B-compatible modules

> I^2C communications mode (emulated)

> Temperature sense diode to monitor the on-chip temperature

> On-chip 3.3V to 2.6V voltage regulator

> Software-programmable Phase-Lock Loop (PLL)

> 12-bit ADCs with 16 inputs, self-calibration and current injection capability

> Up to 76 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

56F8300 Peripherals Manual	Detailed peripheral description of the 56F8300 family of devices **Order Number:** MC56F8300UM
56F8367/ 56F8167 Technical Data Sheet	Electrical and timing specifications, device-specific peripheral information and package and pin descriptions **Order Number:** MC56F8367
56F8367 Product Brief	Summary description and block diagram of the core, memory, peripherals and interfaces **Order Number:** MC56F8367PB
DSP56800E Reference Manual	Detailed description of the DSP56800E architecture, 16-bit core processor and the instruction set **Order Number:** DSP56800ERM

Ordering Information

Part	MC56F8367
Package Type	Low-Profile Quad Flat Pack (LQFP)
Pin Count	160
Temperature Range	-40°C to +125°C
Order Number	MC56F8367MPY60

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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 complete set of evaluation modules (EVMs) and development system cards will support concurrent engineering. Together, PE technology, CodeWarrior tools and EVMs create a complete, scalable tools solution for easy, fast and efficient development.

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