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.

**56800E Core Features**

<table>
<thead>
<tr>
<th>Features</th>
<th>Benefits</th>
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</thead>
<tbody>
<tr>
<td>Up to 60 MIPS at 60 MHz execution frequency</td>
<td>Hybrid architecture facilitates implementation of both control and signal processing functions in a single device</td>
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<tr>
<td>DSP and microcontroller (MCU) functionality in a unified, C-efficient architecture</td>
<td>High-performance secured Flash memory eliminates the need for external storage devices</td>
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<tr>
<td>JTAG/enhanced on-chip emulation (EOnCE™) for unobtrusive, real-time debugging</td>
<td>Extended temperature range up to +125°C allows for operation of nonvolatile memory in harsh environments</td>
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<td>Four 36-bit accumulators</td>
<td>Flash memory emulation of EEPROM eliminates the need for external nonvolatile memory</td>
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<tr>
<td>16- and 32-bit bidirectional barrel shifter</td>
<td>32-bit performance with 16-bit code density</td>
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<tr>
<td>Parallel instruction set with unique addressing modes</td>
<td>On-chip voltage regulator and power management reduce overall system cost</td>
</tr>
<tr>
<td>Hardware DO and REP loops available</td>
<td>Off-chip memory expansion capabilities allow for glueless interfacing with the additional memory of external devices without sacrificing performance</td>
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<td>Three internal address buses</td>
<td>This device boots directly from Flash, providing additional application flexibility</td>
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<tr>
<td>Four internal data buses</td>
<td>High-performance PWM with programmable fault capability simplifies design and promotes compliance with safety regulations</td>
</tr>
<tr>
<td>Architectural support for 8-, 16- and 32-bit single-cycle data fetches</td>
<td>PWM and ADC modules are tightly coupled to reduce processing overhead</td>
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<td>MCU-style software stack support</td>
<td>Low-voltage interrupts (LVIs) protect the system from brownout or power failure</td>
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<tr>
<td>Controller-style addressing modes and instructions</td>
<td>General-purpose input/output (GPIO) pins support application-specific needs</td>
</tr>
<tr>
<td>Single-cycle 16 x 16-bit parallel multiplier-accumulator (MAC)</td>
<td>Simple in-application Flash memory programming via EOnCE or serial communication</td>
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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.
**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 (SCI)
- Sixteen 16-bit timers with input and output compare capability
- Two four-input quadrature decoders
- Two FlexCAN 2.0 B-compatible modules
- PC 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

**Ordering Information**

<table>
<thead>
<tr>
<th>Part</th>
<th>Package Type</th>
<th>Pin Count</th>
<th>Temperature Range</th>
<th>Order Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC56F8367</td>
<td>Low-Profile Quad Flat Pack (LQFP)</td>
<td>160</td>
<td>-40°C to +125°C</td>
<td>MC56F8367MPY60</td>
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