56F8365

**Target Applications**
- Automotive control
- Industrial control
- Advanced motion control
- Home appliances
- General-purpose inverters
- Smart relays
- Fire and security systems
- Power management
- Medical monitoring
- Multiphase inverters

**Overview**
56F8365 designers subscribe to the philosophy that you can never have enough of a good thing. That is why they added more on-chip Flash memory (up to 576 KB), pulse-width modulation (PWM) outputs, analog-to-digital converter (ADC) inputs, timer channels and quadrature decoders to the peripherals found in smaller members of the device family.

With these additions, a whole new set of applications can now benefit from the hybrid microcontroller (MCU)/DSP capabilities of the 56800E architecture. Imagine adding signal processing capabilities to a smart user interface, or adding a sophisticated communication protocol to an industrial control application. The possibilities are endless, especially when you consider that you can have access to all these advanced features at extreme temperatures.

### 56800E Core Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Benefits</th>
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<tbody>
<tr>
<td>Up to 60 MIPS at 60 MHz</td>
<td>Hybrid architecture facilitates implementation of both control and signal processing functions in a single device</td>
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<td>DSP and MCU functionality</td>
<td>High-performance, secured Flash memory eliminates the need for external storage devices</td>
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<td>JTAG/enhanced on-chip emulation</td>
<td>Extended temperature range up to +125°C allows for operation of nonvolatile memory in harsh environments</td>
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<td>Temperature Sensors</td>
<td>Flash memory emulation of EEPROM eliminates the need for external nonvolatile memory</td>
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<td>PLL</td>
<td>32-bit performance with 16-bit code density</td>
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<td>Four 36-bit accumulators</td>
<td>On-chip voltage regulator and power management reduce overall system cost</td>
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<td>16- and 32-bit bidirectional</td>
<td>Diversity of peripheral configuration facilitates the elimination of external components, improving system integration and reliability</td>
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<td>shifter</td>
<td>This device boots directly from Flash, providing additional application flexibility</td>
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<td>Parallel instruction set</td>
<td>High-performance PWM with programmable fault capability simplifies design and promotes compliance with safety regulations</td>
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<td>unique addressing modes</td>
<td>PWM and ADC modules are tightly coupled to reduce processing overhead</td>
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<td>Hardware DO and REP loops</td>
<td>Low-voltage interrupts (LVIs) protect the system from brownout or power failure</td>
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<td>available</td>
<td>Simple in-application Flash memory programming via EOnCE or serial communication</td>
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### Memory

- **Flash Memory**
  - 32 KB Boot Flash
  - 32 KB Flash

- **RAM**
  - 4 KB RAM
  - 32 KB RAM
  - 512 KB RAM

- **Data Memory**
  - 60 MIPS
  - 60 MHz

- **Peripheral Components**
  - COP/Watchdog
  - Temperature Sensor
  - PLL
  - Up to 49 GPIO
  - (16) 16-bit Timer
  - (2) Quadrature Decoder
  - (2) FlexCAN

- **Power Management**
  - (2) SPI
  - (2) SCI
  - JTAG/EOnCE
  - 16-ch. 12-bit ADC

- **Program Memory**
  - 512 KB Flash

- **Connectors**
  - 128 LQFP
**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

**56F8365 Peripheral Circuit Features**

- Two PWM modules with 12 outputs and eight programmable fault inputs
- Two serial peripheral interfaces (SPIs)
- Two serial communications interfaces (SCIs)
- I²C communications master mode (emulated)
- Sixteen 16-bit timers with input and output compare capability
- Two four-input quadrature decoders
- Two FlexCAN modules, 2.0 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)
- 12-bit ADCs with 16 inputs, self-calibration and current injection capability
- Up to 49 general-purpose input/output (GPIO) pins
- External reset input pin for hardware reset
- Computer operating properly (COP)
- Integrated power-on reset and LVI module

**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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