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Embedded in Life

An IXYS Company

Motor Control MCUs

Z16FMC Series

Product Specification

PS028703-0611

PRELIMINARY

www.zilog.com

Warning: DO NOT USE THIS PRODUCT IN LIFE SUPPORT SYSTEMS.

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Revision History

Each instance in the following revision history table reflects a change to this document from its previous version. For more details, refer to the corresponding pages or appropriate links provided in the table.

Date	Revision Level	Section	Description	Page
Jun 2011	03	Electrical Characteristics	Corrected V_{COFF} value in Comparator Electrical Characteristics table.	309
Dec 2010	02	Packaging	Minor corrections to the Zilog Part Numbers table and to the Part Number Suffix Designations map.	319, 321
Nov 2010	01		Original issue.	N/A

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Introduction

Zilog's Z16FMC Series of products is optimized for motor control applications. The Z16FMC is a 16-bit microcontroller with a ZNeo™ CPU and is the most powerful member of Zilog's Motor Control Family of MCUs.

Features

The Z16FMC Series of products includes the following features:

- 20 MHz ZNeo™ CPU
- 128 KB internal Flash memory with 16-bit access and In-Circuit Programming (ICP)
- 4 KB internal RAM with 16-bit access
- 12-channel, 10-bit Analog-to-Digital Converter (ADC)
- Operational Amplifier
- Analog Comparator
- 4-channel Direct Memory Access (DMA) controller
- Two full-duplex 9-bit Universal Asynchronous Receiver/Transmitters (UARTs) with support for Local Interconnect Network (LIN) and Infrared Data Association (IrDA)
- Internal Precision Oscillator (IPO)
- Inter-Integrated Circuit (I^2C) master/slave controller
- Enhanced Serial Peripheral Interface (ESPI)
- 12-bit Pulse Width Modulation (PWM) module with three complementary pairs or six independent PWM outputs with deadband generation and fault trip input
- Three standard 16-bit timers with Capture, Compare and PWM capability
- Watchdog Timer (WDT) with internal RC oscillator
- 46 General-Purpose Input/Output (GPIO) pins
- 24 interrupts with programmable priority
- On-Chip Debugger (OCD)
- Voltage Brownout (VBO) protection
- Power-On Reset (POR)
- 2.7 V to 3.6 V operating voltage with 5 V-tolerant inputs

- 0°C to +70°C standard temperature and –40°C to +105°C extended temperature operating ranges

Block Diagram

Figure 1 displays the architecture of the Z16FMC Series.

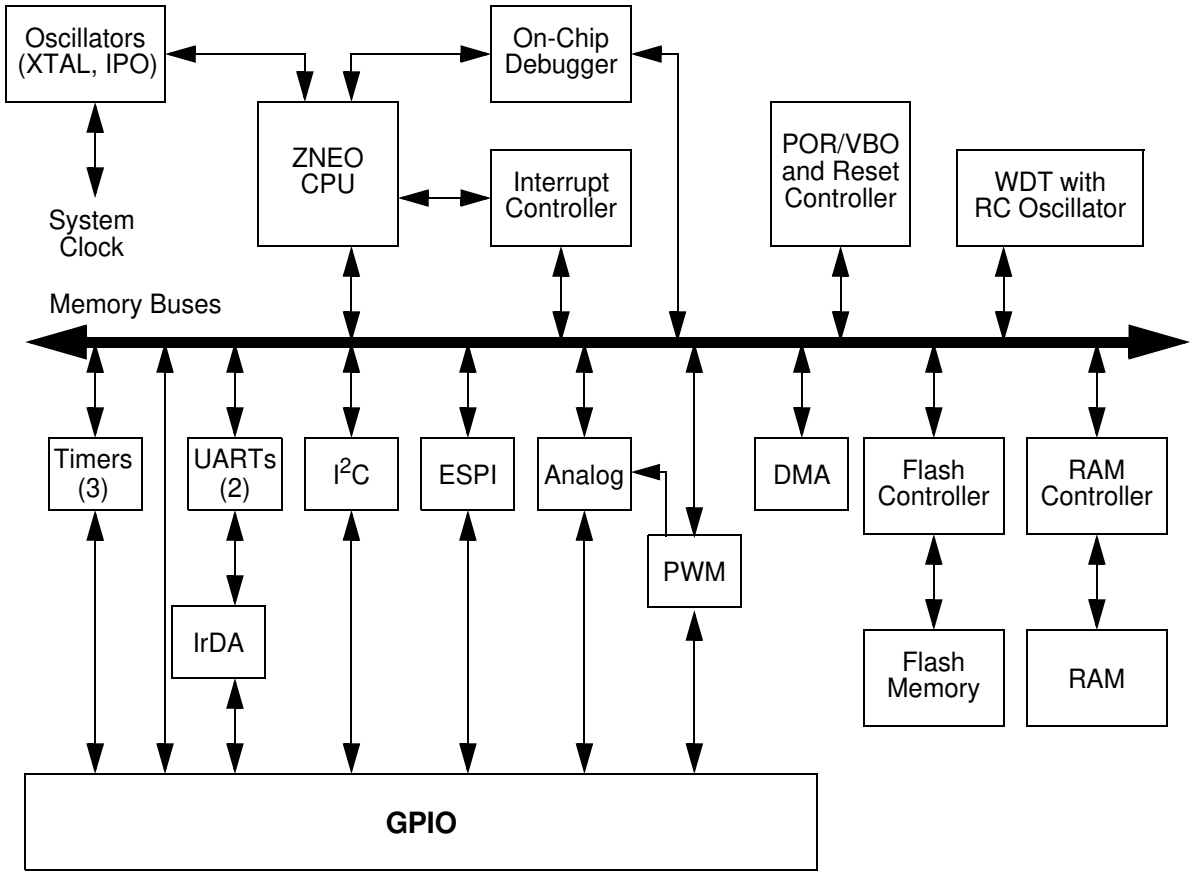

Figure 1. Z16FMC Series Block Diagram

ZNEO CPU Features

Zilog's Z16FMC is powered by the ZNeo™ CPU, which meets the continuing demand for faster and more code-efficient microcontrollers. The ZNeo™ CPU features:

- 8-bit, 16-bit and 32-bit ALU operations
- 24-bit stack with overflow protection

- Direct register-to-register architecture allows each memory address to function as an accumulator to improve execution time and decreases the required program memory
- New instructions improve execution efficiency for code developed using higher-level programming languages including ‘C’
- Pipelined instructions: Fetch, Decode and Execute

For more information about the Z16FMC CPU, refer to the ZNEO CPU User Manual (UM0188), available for download at www.zilog.com.

Flash Z16FMC Controller

The Z16FMC products contain up to 128 KB of internal Flash memory. The Flash controller programs and erases the Flash memory. The ZNEO CPU simultaneously accesses 16 bits of internal Flash memory to improve the processor throughput. A sector protection scheme allows flexible protection of user code.

Random Access Memory

An internal RAM of 4 KB provides storage space for data, variables and stack operations. Like Flash memory, the ZNEO CPU simultaneously accesses 16 bits of internal RAM to improve processor performance.

Motor Control Peripherals Overview

Zilog’s motor control peripherals are briefly described in this section.

10-Bit Analog-to-Digital Converter with Programmable Gain Amplifier

The ADC converts an analog input signal to a 10-bit binary number. The ADC accepts inputs from 12 different analog input sources.

Analog Comparator

It features an on-chip analog comparator with external input pins.

Operational Amplifier

It features a two-input, one-output operational amplifier.