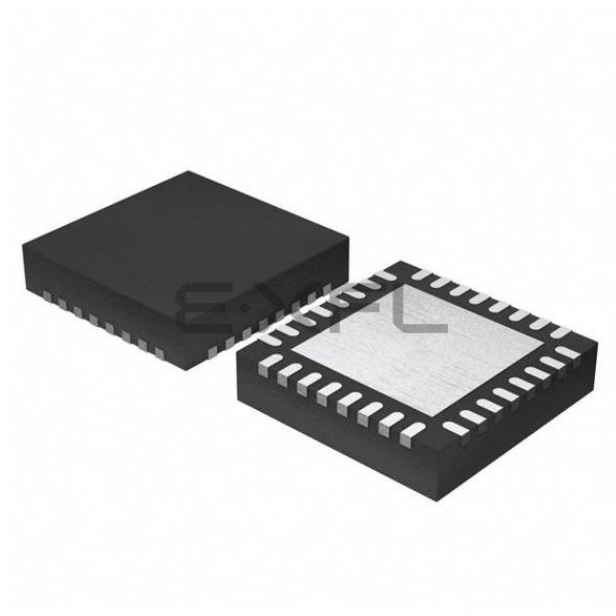

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What is "Embedded - Microcontrollers"?

"Embedded - Microcontrollers" refer to small, integrated circuits designed to perform specific tasks within larger systems. These microcontrollers are essentially compact computers on a single chip, containing a processor core, memory, and programmable input/output peripherals. They are called "embedded" because they are embedded within electronic devices to control various functions, rather than serving as standalone computers. Microcontrollers are crucial in modern electronics, providing the intelligence and control needed for a wide range of applications.

Applications of "Embedded - Microcontrollers"

Details	
Product Status	Active
Core Processor	eZ8
Core Size	8-Bit
Speed	20MHz
Connectivity	I²C, IrDA, LINbus, SPI, UART/USART
Peripherals	Brown-out Detect/Reset, Motor Control PWM, POR, PWM, WDT
Number of I/O	17
Program Memory Size	8KB (8K x 8)
Program Memory Type	FLASH
EEPROM Size	-
RAM Size	512 x 8
Voltage - Supply (Vcc/Vdd)	2.7V ~ 3.6V
Data Converters	A/D 8x10b
Oscillator Type	Internal
Operating Temperature	0°C ~ 70°C (TA)
Mounting Type	Surface Mount
Package / Case	32-VFQFN Exposed Pad
Supplier Device Package	32-QFN (5x5)
Purchase URL	https://www.e-xfl.com/product-detail/zilog/z8fmc08100qksg

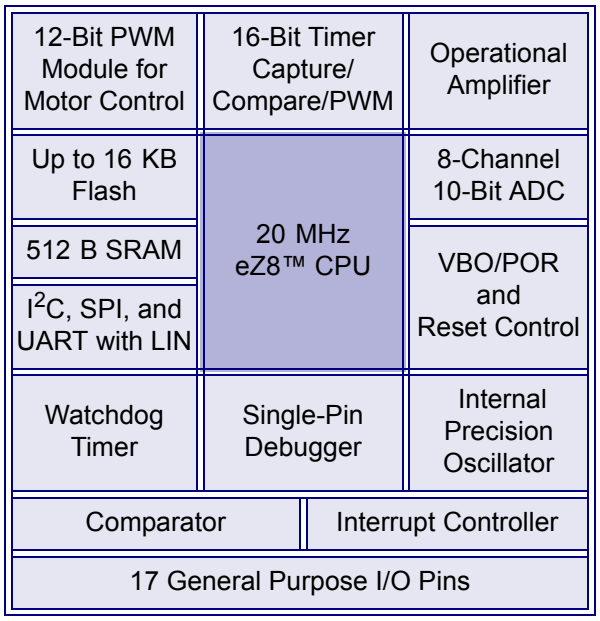
Z8 Encore! MC™ Flash Microcontrollers

Z8FMC16100 Series

Product Brief

PB016607-0308

Product Block Diagram



Overview

Zilog's Z8FMC16100 Series Flash microcontrollers, a part of the Z8 Encore! MC™ family of motor control devices, are based on Zilog's advanced eZ8™ 8-bit CPU core. Optimized for motor control applications, these devices support the control of Single and Multiphase variable-speed motors. Target applications are large appliances, small appliances, HVAC, automotive, power tools, and personal care devices.

Z8FMC16100 Series Flash MCUs feature a flexible pulse width modulator (PWM) module with three complementary pairs or six independent PWM outputs supporting dead-band operation and fault protection trip input. These features provide multiphase control capability for a variety of motor types and ensure safe operation of the motor by providing Pulse-by-Pulse or latched fast shutdown of the PWM pins during fault condition.

Z8FMC16100 Series MCU features up to eight single-ended channels of 10-bit analog-to-digital conversion, with a sample and hold circuit. It also features one operational amplifier for current sampling and one comparator for over-current limiting or shutdown.

A high-speed analog-to-digital converter (ADC) enables voltage, current, and back-EMF sensing, while dual-edge interrupts and a 16-bit timer provide a Hall-effect sensor interface.

A full-duplex 9-bit UART provides serial, asynchronous communication and supports the local interconnect network (LIN) serial communications protocol. The LIN bus is a cost-efficient Single Master, Multiple Slave organization that supports speed up to 20 kbps.

Included in its rich-set of peripherals are other features such as: one additional 16-bit timer with Capture/Compare/PWM capability, SPI or I^2C Master/Slave for serial communication, and an internal precision oscillator (IPO).

The single-pin debugger and programming interface simplifies code development and allows easy in-circuit programming.

Z8FMC16100 Series MCU Features

The features of Z8FMC16100 Series MCU include:

- 20 MHz eZ8 CPU core
- Up to 16 KB Flash program memory
- 512 B register SRAM

- Fast 8-channel 10-bit ADC for current sampling and back-EMF detection
- 12-bit PWM module with three complementary pairs or six independent PWM outputs with dead-band generation and fault trip input
- One 16-bit timer with Capture/Compare/PWM capability
- One analog comparator for current limiting or over current shutdown
- One operational amplifier provides current level-shifting and amplification for ADC current sampling
- I^2C in MASTER, SLAVE, and MULTIMASTER modes
- SPI controller
- UART with LIN interface
- Internal Precision Oscillator (IPO)
- Oscillator supports either internal IPO or external crystals and ceramic resonators
- 17 General-Purpose I/O pins (GPIO)
- Voltage Brownout/Power-On Reset (VBO/POR)
- Watchdog Timer (WDT) with internal RC oscillator
- Single-Pin On-Chip Debugger
- In-circuit serial programming
- Operating at 2.7 V to 3.6 V
- 32-pin QFN and LQFP packages
- Lead-free packaging option
- Standard and extended temperature ranges: 0 ºC to 70 ºC (standard) and –40 ºC to +105 ºC (extended)
- Up to 20 interrupts with configurable priority

eZ8™ CPU Features

The features of eZ8 CPU include:

- New instructions for improved performance including BIT, BSWAP, BTJ, CPC, LDC, LDCI, LEA, MULT, and SRL
- Compatible with existing Z8® code
- Up to 10 MIPS operation
- C-Compiler friendly
- 2 to 9 clock cycles per instruction

Architecture

Figure 1 displays the Z8FMC16100 Series MCU block diagram.

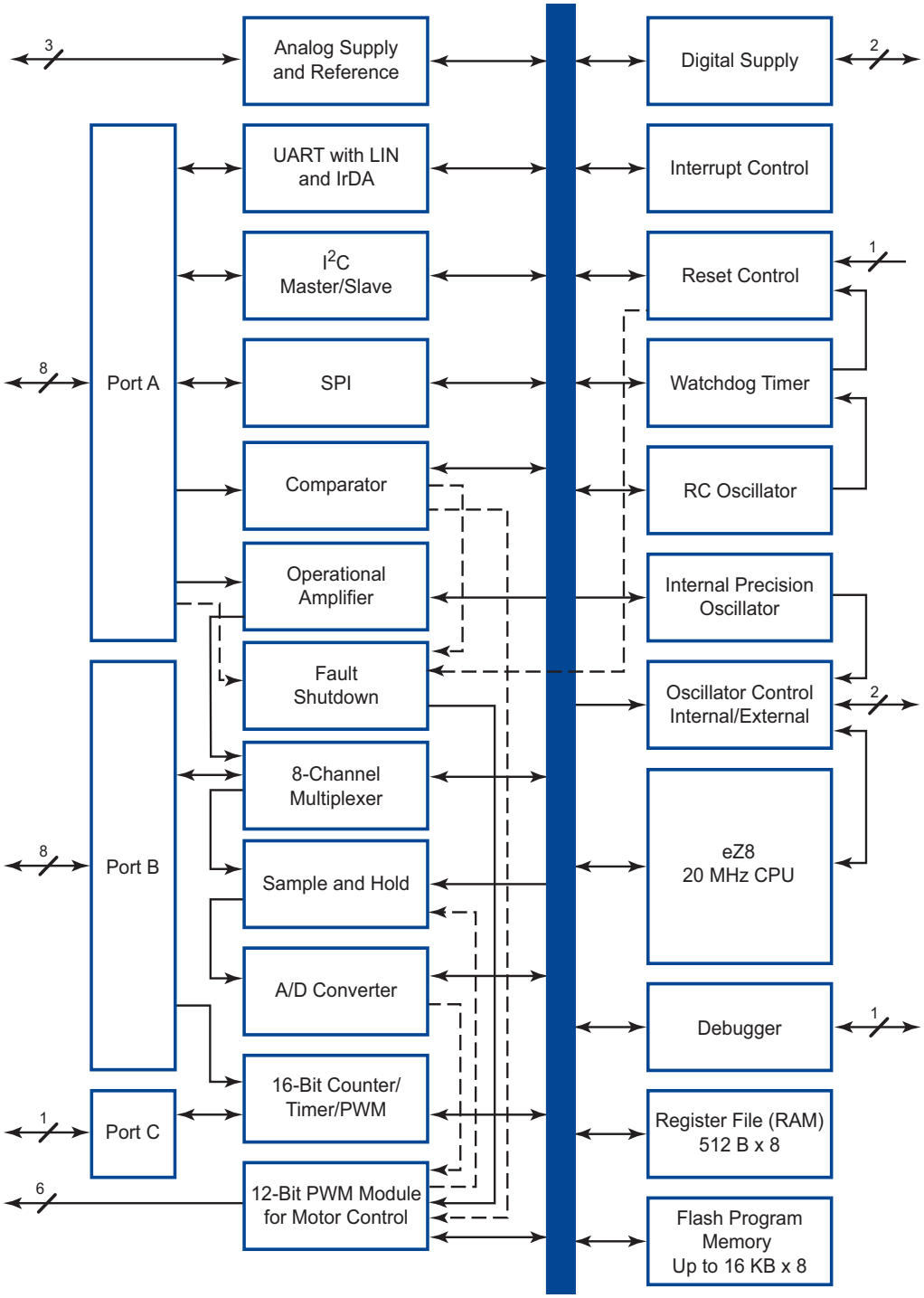


Figure 1. Z8FMC16100 Series MCU Block Diagram

Ordering Information

Table 1 provides the basic features available for each device within the Z8FMC16100 Series product line. Table 2 provides ordering information for the Z8FMC16100 Series products, by part number. See Part Number Suffix Designations on page 6 for product numbering details.

Table 1. Z8FMC16100 Series Part Selection Guide

Product Feature	Z8FMC16100	Z8FMC08100	Z8FMC04100
Flash (KB)	16	8	4
SRAM (B)	512	512	512
General-Purpose I/O	17	17	17
Motor Control PWM Channels	6	6	6
ADC Inputs	8	8	8
Operational Amplifier	Yes	Yes	Yes
Comparator	Yes	Yes	Yes
16-bit Standard Timers with Capture, Compare, PWM	Yes	Yes	Yes
UART with support for LIN and IrDA	Yes	Yes	Yes
I^2C	Yes	Yes	Yes
SPI Controller	Yes	Yes	Yes
Watchdog Timer	Yes	Yes	Yes
5.5296 MHz Internal Precision Oscillator	Yes	Yes	Yes

Each of the parts listed in Table 2 is available in a lead-free package that conforms to responsible environmental standards. For more information regarding ordering, contact your local Zilog® sales office. Zilog web site, www.zilog.com, lists all regional offices and provides additional Z8FMC16100 Series product information.

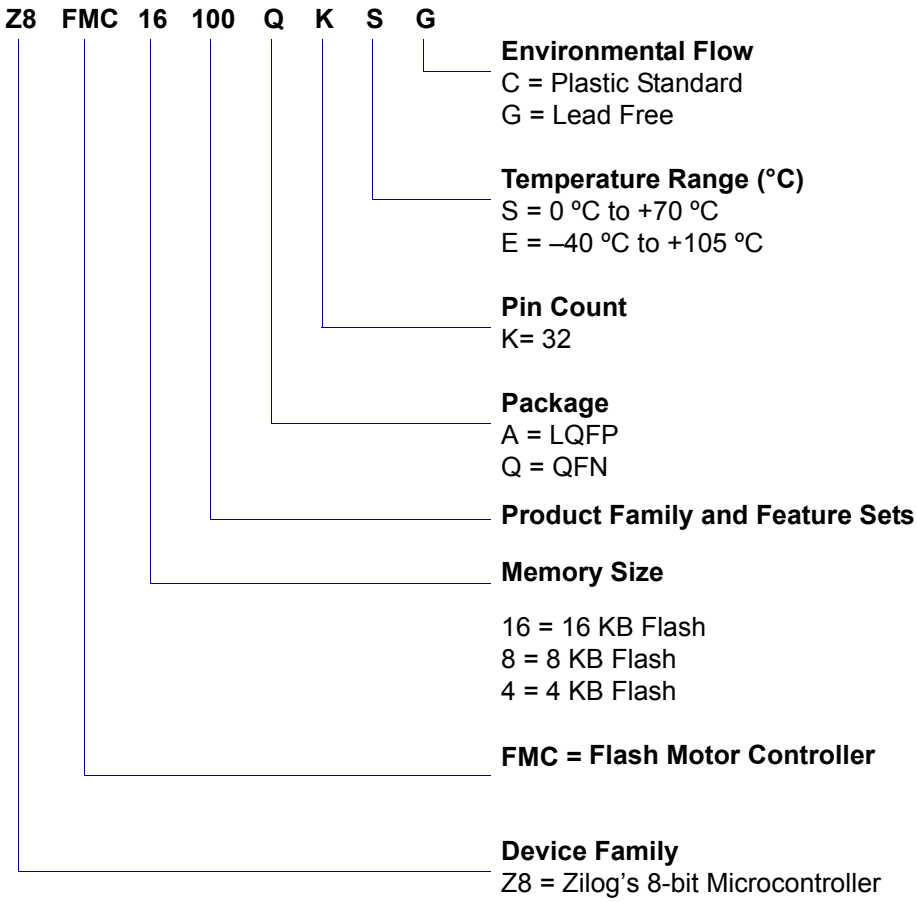
Table 2. Ordering Information for the Z8FMC16100 Series Products*

Part Number	Flash KB (Bytes)	SRAM Bytes	GPIO	Max. Speed (MHz)	I²C/SPI	Trimmed IPO	Package	Temp (°C)
Z8FMC16100 with 16 KB Flash and 512 B SRAM								
Z8FMC16100QKSG	16 (16,384)	512	17	20	I²C/SPI	Y	QFN-32	0 to +70
Z8FMC16100QKEG								–40 to +105
Z8FMC16100AKSG	16 (16,384)	512	17	20	I²C/SPI	Y	LQFP-32	0 to +70
Z8FMC16100AKEG								–40 to +105
Z8FMC08100 with 8 KB Flash and 512B SRAM								
Z8FMC08100QKSG	8 (8,192)	512	17	20	I²C/SPI	Y	QFN-32	0 to +70
Z8FMC08100QKEG								–40 to +105
Z8FMC08100AKSG	8 (8,192)	512	17	20	I²C/SPI	Y	LQFP-32	0 to +70
Z8FMC08100AKEG								–40 to +105
Z8FMC04100 with 4 KB Flash and 512B SRAM								
Z8FMC04100QKSG	4 (4,096)	512	17	20	I²C/SPI	Y	QFN-32	0 to +70
Z8FMC04100QKEG								–40 to +105
Z8FMC04100AKSG	4 (4,096)	512	17	20	I²C/SPI	Y	LQFP-32	0 to +70
Z8FMC04100AKEG								–40 to +105
Z8FMC16100 Series Development Tools								
Z8FMC160100KITG	Z8FMC16100 Series Development Kit							
Z8FMC161000ZEM	Z8 Encore! Z8FMC16100 Series In-Circuit Emulator Development Tool							
ZUSBOPTSC01ZACG	USB Opto-isolated Smart Cable Accessory Kit							
Z8FMC16100 Series Development Tools								

*Factory programming of the devices in this table are available upon request from Zilog®.

Part Number Suffix Designations

Zilog part numbers consist of a number of components. This section describes an example part number, Z8FMC16100QKSG, to indicate each components' description.



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