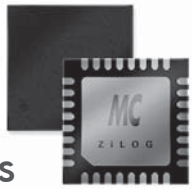
Motor Control Solutions

Z8 Encore! MC™ 8-bit Microcontrollers



ZiLOG

3-PHASE AC INDUCTION

Z8FMC16100 Series MCU

MOTOR TYPES COMMONLY USED

- Heating, ventilation, and air conditioning
- Small and large appliances
- Pumps
- Compressor fans
- Industrial drives and machines

FEATURES THAT SEPARATE US FROM THE REST

- 8-channel 2µs A/D Converter allows accurate current and back EMF sensing
- Time stamp on ADC sampling for accurate back EMF zero crossing
- Op-amp with external gain settings for current sensing amplification
- Comparator with programmable shutdown for over-current protection
- 3-phase PWM module optimized for motor control
- 4% Internal Precision Oscillator

THE Z8 ENCORE! MC

AC induction motors offer users simple, rugged construction, easy maintenance, and cost-effective pricing. These characteristics have promoted standardization and development of a manufacturing infrastructure that has led to a vast installed base of motors; more than 90% of all motors used in industry worldwide are AC induction motors. Most of the power-generating systems produce AC power, making the AC motors very convenient to use. Some AC motors also don't have brushes, thus eliminating the problem of wear and maintenance and dangerous sparking. AC motors are best suited for applications requiring constant speed, but this limitation can easily be solved through use of adjustable speed control based on pulse-width modulation (PWM). In addition to speed regulation, our Z8 Encore! MC™ microcontrollers help improve energy efficiency, lower system cost, and provide quiet operation. AC induction motors are often referred to as the workhorse of the industry; now you can improve and simplify their operation with ZiLOG's motor control microcontrollers.

DESIGN CHALLENGES

Adjustable Speed Regulation

Integrated PWM, op-amp, time stamp, and s/h circuitry provide effective tools to determine the rotor's position and achieve tight speed control.

Energy Efficiency

Our 2µs ADC with time stamp is tied to the PWM module and allows you more accurate control of the motor at lower or variable speeds to reduce power consumption.

Reliable Sensorless Startup

Accomplish accurate positional feedback in sensorless motor control applications with our fast ADC tied to the PWM module controlled by a distinctive back EMF control algorithm.

High Speed

Our fast ADC and the 20 MHz CPU core provide the processing ability required to run the complex motor control algorithms to support the high speed of AC induction motors.

Quiet Operation

Keep your appliance system's audible noise low by using the soft start feature and ability to adjust the speed of the motor by using our advanced analog motor control features.

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Z8 Encore! MC™ 8-bit Microcontrollers

3-PHASE AC INDUCTION MOTORS

Z8FMC16100 Series MCU

BLOCK DIAGRAM

12-bit PWM Module for Motor Control	16-bit Time Capture Copture/ Compare /PWM	Operational Amplifier with dedicated sample and hold
SPI, I2C and UART with LIN	**20MHz eZ8 CPU**	8 Channel 10-bit ADC
Up to 512B RAM	Up to 16KB Flash	POR/VBO and Reset Control
Watch-Dog Timer	Debugger	Internal Precision Oscillator
Comparator	Interrupt Controller	
Up to 17 General-Purpose I/O Pins		

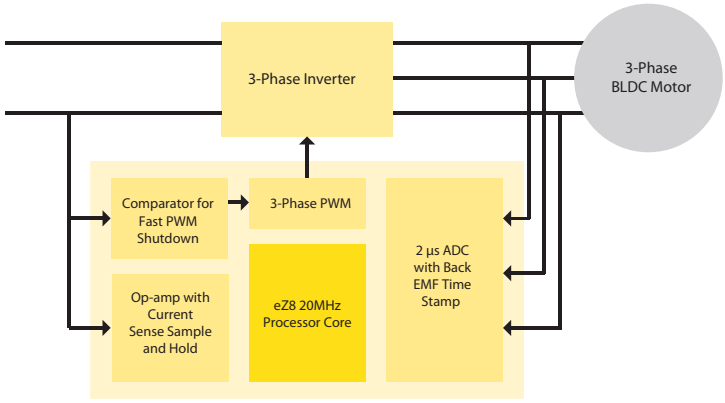
MCU FEATURES

- 20MHz CPU core
- Up to 16KB Flash memory
- Up to 512B RAM
- 6-channels of 12-bit PWM with fast shut down
- 8-channel 2µs 10-bit ADC with internal reference
- Operational amplifier
- Analog comparator
- Internal Precision Oscillator
- UART with LIN, SPI, I^2C
- One 16-bit timer
- Single-pin debug
- Watch Dog Timer (WDT), Voltage Brown Out (VBO),
- Power On Reset (POR)
- 32-pin QFN or LQFP
- 2.7-3.6V operation
- Standard (0° to 70°C) and extended (-40° to 105°C) temperature range (125° available upon special request)

REFERENCE TOOLS

- Software libraries
- Reference designs
- Application notes

SYSTEM DIAGRAM



DEVELOPMENT TOOLS INFORMATION

Z8 Encore! MC™ Z8FMC16100 Series MCU Development Kit is the low cost motor control development tool which contains everything you need to evaluate and design your next motor control project. Includes:

- Brushless DC application board
- Z8FMC16100 series MCU development board
- Opto-isolated USB debugging and programming cable
- ZDS II Integrated Development Environment (IDE) with a full ANSI C compiler

Z8 Encore! MC™ Z8FMC16100 Series MCU In-Circuit Emulator Kit is recommended for more advanced development with trace and event system.

FOR MORE INFORMATION

Visit us at www.zilog.com or call us at 1(866) GO ZiLOG