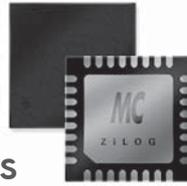


Motor Control Solutions

Z8 Encore! MC™ 8-bit Microcontrollers



3-PHASE BLDC MOTORS



Z8FMC16100 Series MCU

MAIN APPLICATIONS

- Heating, ventilation and air conditioning
- Small and large appliances
- Pumps
- Automotive (power steering, seat control)
- Toys
- Compressors and fans
- Industrial drives

FEATURES THAT SEPARATE US FROM THE REST

- 8-channel $2\mu\text{s}$ 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

Due to their falling costs over the recent years, brushless DC (BLDC) motors have been gaining more market share and are gaining in popularity because of their high efficiency and reliability, small size, and silent operation. ZiLOG's high performance Z8 Encore! MC™ 8-bit microcontrollers provide the advanced electronic features needed to keep your BLDC design competitive in the marketplace today. Accurate motor control and high speed processing while improving energy efficiency and system cost – achieve all that and more with Z8 Encore! MC™ microcontrollers.

DESIGN CHALLENGES

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 BLDC motors.

Accurate Torque Regulation

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

Energy Efficiency

Ability to run the motor at slower speeds reduces power consumption. Our $2\mu\text{s}$ ADC with time stamp is tied to the PWM module and allows you more accurate control of the motor at lower or variable speeds.

Quiet Operation

Keep your BLDC motor'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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BLOCK DIAGRAM

12-bit PWM Module for Motor Control	16-bit Time Capture Capture/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		

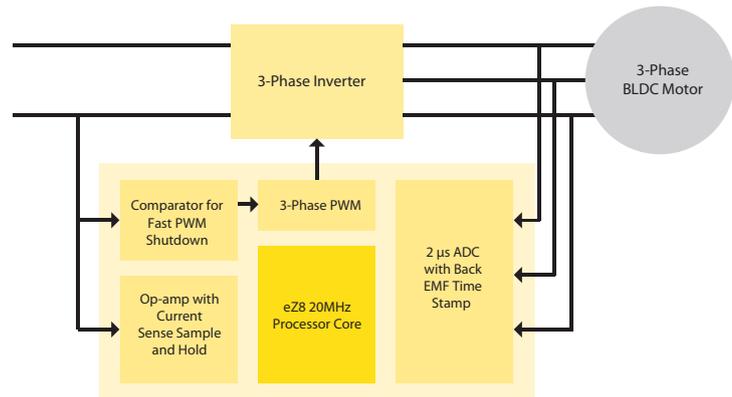
MCU FEATURES

- 20MHz CPU core
- Up to 16KB Flash memory
- Up to 512B RAM
- 6-channels of 12-bit PWM with fast shut down
- 8-channel 2 μ s 10-bit ADC with internal reference
- Operational amplifier
- Analog comparator
- Internal Precision Oscillator
- UART with LIN, SPI, I²C
- 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