



Z i L O G

High-Performance 8-Bit Microcontrollers

Z8 Encore!® 4K Series

Product Brief

PB014206-0106

Z8 Encore!

Product Block Diagram

1–4 KB Flash	256 B–1 KB RAM	Up to 8 10-Bit ADC Channels
Watch-Dog Timer with RC Oscillator	5 MHz eZ8 CPU	Two 16-Bit Timers/PWM
Analog Comparator		POR/VBO & Reset Control
UART with IrDA	On-Chip Debugger	Internal Precision Oscillator
Up to 24 General-Purpose I/O Pins		

Overview

The Z8 Encore!® 4K Series Flash microcontrollers are based on the ZiLOG® eZ8 CPU. The Z8 Encore!® 4K Series MCU family of devices sets a new standard of performance and on-chip peripherals.

The Z8 Encore!® 4K Series feature support up to 4 KB of Flash program memory and 1KB register RAM.

The Z8 Encore!® 4K Series devices feature up to eight single-ended/differential channels of 10-bit A/D conversion.

These devices include two enhanced 16-bit reloadable timers featuring Capture, Compare, and PWM capabilities.

Up to 18 vectored interrupts with programmable priorities provide increased application flexibility.

The Z8 Encore!® 4K Series features an on-chip Internal Precision Oscillator (5 MHz/32 KHz) as a trimmable clock source that requires no external components.

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

The full-duplex UART provides serial communications and IrDA encoding and decoding capability. The UART baud rate generator (BRG) can be configured and used as a basic 16-bit timer.

Z8 Encore!® 4K Series Features

Key features of Z8 Encore!® 4K Series MCU include:

- 5 MHz eZ8 CPU core
- Up to 4 KB Flash memory with in-circuit programming capability
- Up to 1 KB register RAM
- Up to 8 channels 10-bit analog-to-digital converter (ADC)
- On-chip analog comparator
- Full-duplex 9-bit UART with bus transceiver Driver Enable Control
- The UART baud rate generator (BRG) can be configured and used as a basic 16-bit timer
- Infrared Data Association (IrDA)-compliant infrared encoder/decoders, integrated with UART
- Two 16-bit timers with capture, compare, and PWM capabilities
- Watch-Dog Timer (WDT) with internal RC oscillator



- 16 to 24 I/O pins depending upon package
- Direct LED Drive with programmable drive strengths
- Up to 18 interrupts with configurable priority
- On-chip debugger
- Voltage Brown-Out Protection (VBO)
- Power-On Reset (POR)
- Internal Precision Oscillator (5 MHz/32 KHz)
- 2.7 to 3.6 V operating voltage with 5 V-tolerant inputs
- 8-pin, 20-pin, and 28-pin packages
- 0°C to +70°C standard temperature and –40°C to +105°C extended temperature operating ranges

eZ8 CPU Features

The eZ8 CPU, ZiLOGs latest 8-bit central processing unit, meets the continuing demand for faster and more code-efficient microcontrollers. The eZ8 CPU features include:

- New instructions for improved performance including BIT, BSWAP, BTJ, CPC, LDC, LDCI, LEA, MULT, and SRL
- New instructions support 12-bit linear addressing of the Register File
- Compatible with existing Z8[®] code
- Up to 10 MIPS operation
- C-Compiler friendly
- 2 to 9 clock cycles per instruction

Z8 Encore![®] 4K Series Development Kit

The Z8 Encore![®] 4K Series Development System includes the following:

Hardware

- Z8 Encore![®] 4K Series Development Board
- Smart Cable for PC to Z8 Encore![®] 4K Series Development Board (DB9 to 6-pin male)
- 5 V DC power supply

Software on CD-ROM

- ZDS II–Z8 Encore![®] IDE with ANSI C-Compiler
- Sample code
- Document browser
- Acrobat Reader[®]

Documentation

- Quick Start Guide
- Registration card
- Z8 Encore![®] 4K Series technical documentation (on CD-ROM)
 - Development Kit User Manual
 - ZDSII IDE User Manual
 - eZ8 CPU User Manual
 - Product Specification
 - Product Brief
 - Application Notes

Architecture

Figure 1 illustrates the Z8 Encore!® 4K Series block diagram.

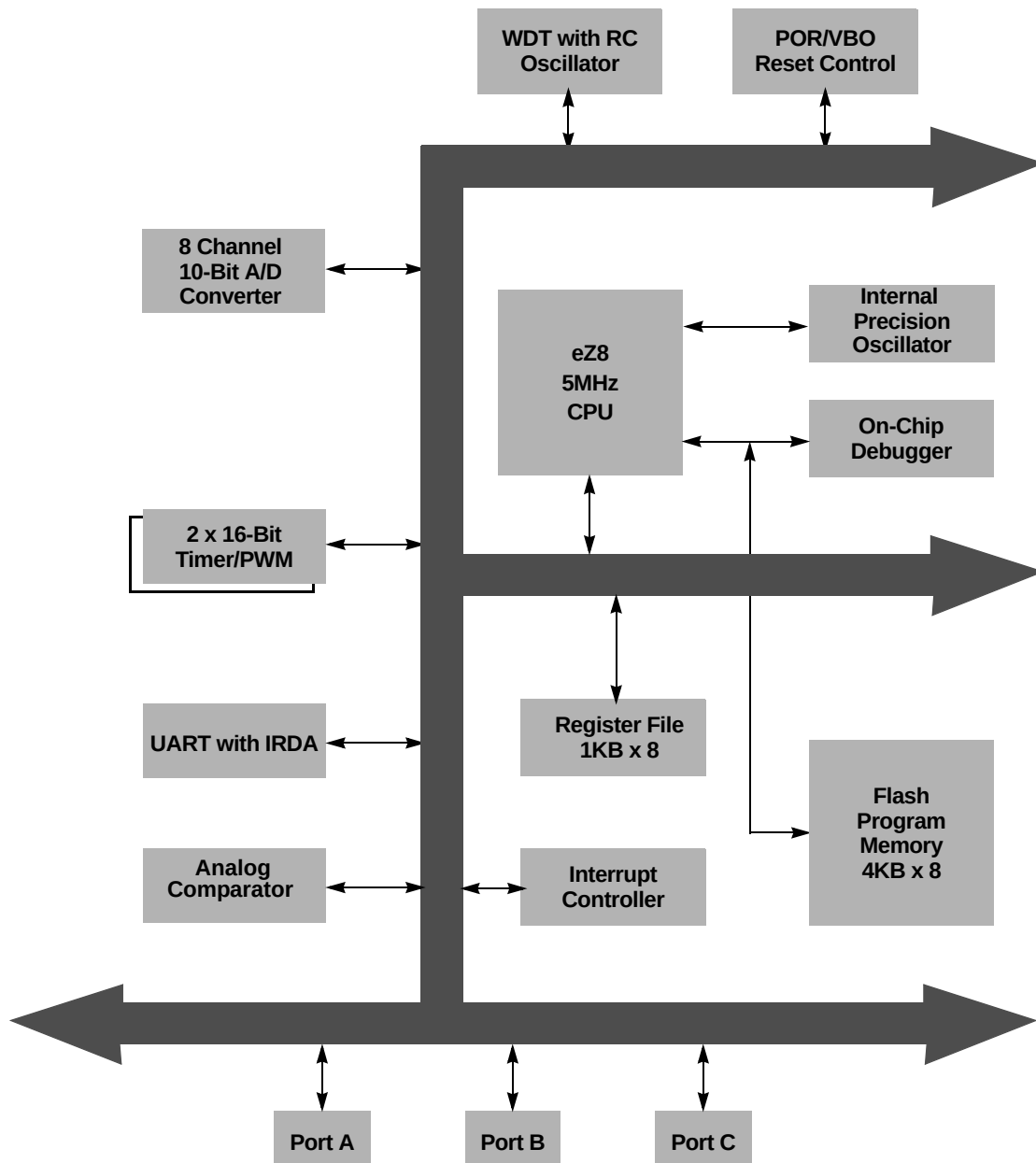


Figure 1. Z8 Encore!® 4K Series Block Diagram



Ordering Information

You can order the Z8 Encore!® 4K Series from ZiLOG®, referencing the following part numbers. For more information regarding ordering, please consult your local ZiLOG® sales office. The ZiLOG® website www.zilog.com lists all regional offices and provides additional Z8 Encore!® product information.

Part Number	Flash	RAM	I/O Lines	Interrupts	16-Bit Timers w/PWM	10-Bit A/D Channels	UART with IrDA	Comparator	Description
Z8 Encore!® with 4KB Flash, 10-Bit Analog-to-Digital Converter									
Standard Temperature: 0° to +70°C									
Z8F0423PB005SC	4 KB	1 KB	6	12	2	4	1	1	PDIP 8-pin package
Z8F0423QB005SC	4 KB	1 KB	6	12	2	4	1	1	QFN 8-pin package
Z8F0423SB005SC	4 KB	1 KB	6	12	2	4	1	1	SOIC 8-pin package
Z8F0423SH005SC	4 KB	1 KB	16	18	2	7	1	1	SOIC 20-pin package
Z8F0423HH005SC	4 KB	1 KB	16	18	2	7	1	1	SSOP 20-pin package
Z8F0423PH005SC	4 KB	1 KB	16	18	2	7	1	1	PDIP 20-pin package
Z8F0423SJ005SC	4 KB	1 KB	22	18	2	8	1	1	SOIC 28-pin package
Z8F0423HJ005SC	4 KB	1 KB	22	18	2	8	1	1	SSOP 28-pin package
Z8F0423PJ005SC	4 KB	1 KB	22	18	2	8	1	1	PDIP 28-pin package
Extended Temperature: -40° to +105°C									
Z8F0423PB005EC	4 KB	1 KB	6	12	2	4	1	1	PDIP 8-pin package
Z8F0423QB005EC	4 KB	1 KB	6	12	2	4	1	1	QFN 8-pin package
Z8F0423SB005EC	4 KB	1 KB	6	12	2	4	1	1	SOIC 8-pin package
Z8F0423SH005EC	4 KB	1 KB	16	18	2	7	1	1	SOIC 20-pin package
Z8F0423HH005EC	4 KB	1 KB	16	18	2	7	1	1	SSOP 20-pin package
Z8F0423PH005EC	4 KB	1 KB	16	18	2	7	1	1	PDIP 20-pin package
Z8F0423SJ005EC	4 KB	1 KB	22	18	2	8	1	1	SOIC 28-pin package
Z8F0423HJ005EC	4 KB	1 KB	22	18	2	8	1	1	SSOP 28-pin package
Z8F0423PJ005EC	4 KB	1 KB	22	18	2	8	1	1	PDIP 28-pin package
Replace C with G for Lead-Free Packaging									



Part Number	Flash	RAM	I/O Lines	Interrupts	16-Bit Timers w/PWM	10-Bit A/D Channels	UART with IrDA	Comparator	Description
Z8 Encore!® with 4KB Flash									
Standard Temperature: 0° to 70°C									
Z8F0413PB005SC	4 KB	1 KB	6	12	2	0	1	1	PDIP 8-pin package
Z8F0413QB005SC	4 KB	1 KB	6	12	2	0	1	1	QFN 8-pin package
Z8F0413SB005SC	4 KB	1 KB	6	12	2	0	1	1	SOIC 8-pin package
Z8F0413SH005SC	4 KB	1 KB	16	18	2	0	1	1	SOIC 20-pin package
Z8F0413HH005SC	4 KB	1 KB	16	18	2	0	1	1	SSOP 20-pin package
Z8F0413PH005SC	4 KB	1 KB	16	18	2	0	1	1	PDIP 20-pin package
Z8F0413SJ005SC	4 KB	1 KB	24	18	2	0	1	1	SOIC 28-pin package
Z8F0413HJ005SC	4 KB	1 KB	24	18	2	0	1	1	SSOP 28-pin package
Z8F0413PJ005SC	4 KB	1 KB	24	18	2	0	1	1	PDIP 28-pin package
Extended Temperature: -40° to 105°C									
Z8F0413PB005EC	4 KB	1 KB	6	12	2	0	1	1	PDIP 8-pin package
Z8F0413QB005EC	4 KB	1 KB	6	12	2	0	1	1	QFN 8-pin package
Z8F0413SB005EC	4 KB	1 KB	6	12	2	0	1	1	SOIC 8-pin package
Z8F0413SH005EC	4 KB	1 KB	16	18	2	0	1	1	SOIC 20-pin package
Z8F0413HH005EC	4 KB	1 KB	16	18	2	0	1	1	SSOP 20-pin package
Z8F0413PH005EC	4 KB	1 KB	16	18	2	0	1	1	PDIP 20-pin package
Z8F0413SJ005EC	4 KB	1 KB	24	18	2	0	1	1	SOIC 28-pin package
Z8F0413HJ005EC	4 KB	1 KB	24	18	2	0	1	1	SSOP 28-pin package
Z8F0413PJ005EC	4 KB	1 KB	24	18	2	0	1	1	PDIP 28-pin package
Replace C with G for Lead-Free Packaging									



Part Number	Flash	RAM	I/O Lines	Interrupts	16-Bit Timers w/PWM	10-Bit A/D Channels	UART with IrDA	Comparator	Description
Z8 Encore!® with 2KB Flash, 10-Bit analog-to-Digital Converter									
Standard Temperature: 0° to 70°C									
Z8F0223PB005SC	2 KB	512 B	6	12	2	4	1	1	PDIP 8-pin package
Z8F0223QB005SC	2 KB	512 B	6	12	2	4	1	1	QFN 8-pin package
Z8F0223SB005SC	2 KB	512 B	6	12	2	4	1	1	SOIC 8-pin package
Z8F0223SH005SC	2 KB	512 B	16	18	2	7	1	1	SOIC 20-pin package
Z8F0223HH005SC	2 KB	512 B	16	18	2	7	1	1	SSOP 20-pin package
Z8F0223PH005SC	2 KB	512 B	16	18	2	7	1	1	PDIP 20-pin package
Z8F0223SJ005SC	2 KB	512 B	22	18	2	8	1	1	SOIC 28-pin package
Z8F0223HJ005SC	2 KB	512 B	22	18	2	8	1	1	SSOP 28-pin package
Z8F0223PJ005SC	2 KB	512 B	22	18	2	8	1	1	PDIP 28-pin package
Extended Temperature: -40° to 105°C									
Z8F0223PB005EC	2 KB	512 B	6	12	2	4	1	1	PDIP 8-pin package
Z8F0223QB005EC	2 KB	512 B	6	12	2	4	1	1	QFN 8-pin package
Z8F0223SB005EC	2 KB	512 B	6	12	2	4	1	1	SOIC 8-pin package
Z8F0223SH005EC	2 KB	512 B	16	18	2	7	1	1	SOIC 20-pin package
Z8F0223HH005EC	2 KB	512 B	16	18	2	7	1	1	SSOP 20-pin package
Z8F0223PH005EC	2 KB	512 B	16	18	2	7	1	1	PDIP 20-pin package
Z8F0223SJ005EC	2 KB	512 B	22	18	2	8	1	1	SOIC 28-pin package
Z8F0223HJ005EC	2 KB	512 B	22	18	2	8	1	1	SSOP 28-pin package
Z8F0223PJ005EC	2 KB	512 B	22	18	2	8	1	1	PDIP 28-pin package
Replace C with G for Lead-Free Packaging									



Part Number	Flash	RAM	I/O Lines	Interrupts	16-Bit Timers w/PWM	10-Bit A/D Channels	UART with IrDA	Comparator	Description
Z8 Encore!® with 2KB Flash									
Standard Temperature: 0° to 70°C									
Z8F0213PB005SC	2 KB	512 B	6	12	2	0	1	1	PDIP 8-pin package
Z8F0213QB005SC	2 KB	512 B	6	12	2	0	1	1	QFN 8-pin package
Z8F0213SB005SC	2 KB	512 B	6	12	2	0	1	1	SOIC 8-pin package
Z8F0213SH005SC	2 KB	512 B	16	18	2	0	1	1	SOIC 20-pin package
Z8F0213HH005SC	2 KB	512 B	16	18	2	0	1	1	SSOP 20-pin package
Z8F0213PH005SC	2 KB	512 B	16	18	2	0	1	1	PDIP 20-pin package
Z8F0213SJ005SC	2 KB	512 B	24	18	2	0	1	1	SOIC 28-pin package
Z8F0213HJ005SC	2 KB	512 B	24	18	2	0	1	1	SSOP 28-pin package
Z8F0213PJ005SC	2 KB	512 B	24	18	2	0	1	1	PDIP 28-pin package
Extended Temperature: -40° to 105°C									
Z8F0213PB005EC	2 KB	512 B	6	12	2	0	1	1	PDIP 8-pin package
Z8F0213QB005EC	2 KB	512 B	6	12	2	0	1	1	QFN 8-pin package
Z8F0213SB005EC	2 KB	512 B	6	12	2	0	1	1	SOIC 8-pin package
Z8F0213SH005EC	2 KB	512 B	16	18	2	0	1	1	SOIC 20-pin package
Z8F0213HH005EC	2 KB	512 B	16	18	2	0	1	1	SSOP 20-pin package
Z8F0213PH005EC	2 KB	512 B	16	18	2	0	1	1	PDIP 20-pin package
Z8F0213SJ005EC	2 KB	512 B	24	18	2	0	1	1	SOIC 28-pin package
Z8F0213HJ005EC	2 KB	512 B	24	18	2	0	1	1	SSOP 28-pin package
Z8F0213PJ005EC	2 KB	512 B	24	18	2	0	1	1	PDIP 28-pin package
Replace C with G for Lead-Free Packaging									



Part Number	Flash	RAM	I/O Lines	Interrupts	16-Bit Timers w/PWM	10-Bit A/D Channels	UART with IrDA	Comparator	Description
Z8 Encore!® with 1KB Flash, 10-Bit Analog-to-Digital Converter									
Standard Temperature: 0° to 70°C									
Z8F0123PB005SC	1 KB	256 B	6	12	2	4	1	1	PDIP 8-pin package
Z8F0123QB005SC	1 KB	256 B	6	12	2	4	1	1	QFN 8-pin package
Z8F0123SB005SC	1 KB	256 B	6	12	2	4	1	1	SOIC 8-pin package
Z8F0123SH005SC	1 KB	256 B	16	18	2	7	1	1	SOIC 20-pin package
Z8F0123HH005SC	1 KB	256 B	16	18	2	7	1	1	SSOP 20-pin package
Z8F0123PH005SC	1 KB	256 B	16	18	2	7	1	1	PDIP 20-pin package
Z8F0123SJ005SC	1 KB	256 B	22	18	2	8	1	1	SOIC 28-pin package
Z8F0123HJ005SC	1 KB	256 B	22	18	2	8	1	1	SSOP 28-pin package
Z8F0123PJ005SC	1 KB	256 B	22	18	2	8	1	1	PDIP 28-pin package
Extended Temperature: -40° to 105°C									
Z8F0123PB005EC	1 KB	256 B	6	12	2	4	1	1	PDIP 8-pin package
Z8F0123QB005EC	1 KB	256 B	6	12	2	4	1	1	QFN 8-pin package
Z8F0123SB005EC	1 KB	256 B	6	12	2	4	1	1	SOIC 8-pin package
Z8F0123SH005EC	1 KB	256 B	16	18	2	7	1	1	SOIC 20-pin package
Z8F0123HH005EC	1 KB	256 B	16	18	2	7	1	1	SSOP 20-pin package
Z8F0123PH005EC	1 KB	256 B	16	18	2	7	1	1	PDIP 20-pin package
Z8F0123SJ005EC	1 KB	256 B	22	18	2	8	1	1	SOIC 28-pin package
Z8F0123HJ005EC	1 KB	256 B	22	18	2	8	1	1	SSOP 28-pin package
Z8F0123PJ005EC	1 KB	256 B	22	18	2	8	1	1	PDIP 28-pin package
Replace C with G for Lead-Free Packaging									



Part Number	Flash	RAM	I/O Lines	Interrupts	16-Bit Timers w/PWM	10-Bit A/D Channels	UART with IrDA	Comparator	Description
Z8 Encore!® with 1KB Flash									
Standard Temperature: 0° to 70°C									
Z8F0113PB005SC	1 KB	256 B	6	12	2	0	1	1	PDIP 8-pin package
Z8F0113QB005SC	1 KB	256 B	6	12	2	0	1	1	QFN 8-pin package
Z8F0113SB005SC	1 KB	256 B	6	12	2	0	1	1	SOIC 8-pin package
Z8F0113SH005SC	1 KB	256 B	16	18	2	0	1	1	SOIC 20-pin package
Z8F0113HH005SC	1 KB	256 B	16	18	2	0	1	1	SSOP 20-pin package
Z8F0113PH005SC	1 KB	256 B	16	18	2	0	1	1	PDIP 20-pin package
Z8F0113SJ005SC	1 KB	256 B	24	18	2	0	1	1	SOIC 28-pin package
Z8F0113HJ005SC	1 KB	256 B	24	18	2	0	1	1	SSOP 28-pin package
Z8F0113PJ005SC	1 KB	256 B	24	18	2	0	1	1	PDIP 28-pin package
Extended Temperature: -40° to 105°C									
Z8F0113PB005EC	1 KB	256 B	6	12	2	0	1	1	PDIP 8-pin package
Z8F0113QB005EC	1 KB	256 B	6	12	2	0	1	1	QFN 8-pin package
Z8F0113SB005EC	1 KB	256 B	6	12	2	0	1	1	SOIC 8-pin package
Z8F0113SH005EC	1 KB	256 B	16	18	2	0	1	1	SOIC 20-pin package
Z8F0113HH005EC	1 KB	256 B	16	18	2	0	1	1	SSOP 20-pin package
Z8F0113PH005EC	1 KB	256 B	16	18	2	0	1	1	PDIP 20-pin package
Z8F0113SJ005EC	1 KB	256 B	24	18	2	0	1	1	SOIC 28-pin package
Z8F0113HJ005EC	1 KB	256 B	24	18	2	0	1	1	SSOP 28-pin package
Z8F0113PJ005EC	1 KB	256 B	24	18	2	0	1	1	PDIP 28-pin package
Replace C with G for Lead-Free Packaging									
Z8F04A28100KIT									20-Pin and 28-Pin Development Kit
Z8F04A08100KIT									8-Pin Development Kit
ZUSBSC0100ZAC									USB Smart Cable Accessory Kit



Part Number Suffix Designations

Z8 F 04 23 S H 005 S C

Environmental Flow:

C = Plastic Standard
G = Lead Free

Temperature Range (°C):

S = Standard, 0 to +70
E = Extended, -40 to +105

Speed:

005 = 5 MHz

Pin Count:

B = 8
H = 20
J = 28

Package:

Q = QFN
H = SSOP
P = PDIP
S = SOIC

Device Type

Memory Size:

04 = 4 KB Flash, 1 KB RAM
02 = 2 KB Flash, 512 B RAM
01 = 1 KB Flash, 256 B RAM

Memory Type:

F = Flash

Device Family



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ZiLOG Worldwide Headquarters

532 Race Street
San Jose, CA 95126
Telephone: 408.558.8500
Fax: 408.558.8300
www.ZiLOG.com

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[Z8F0213HH005SC](#) [Z8F0223SJ005EC](#) [Z8F0223PJ005EC](#) [Z8F0423SB005SC](#) [Z8F0423PB005SG](#) [Z8F0423SB005SG](#)
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