

# High-Performance 8-Bit Microcontrollers

## Z8 Encore! XP<sup>®</sup> F0823 Series

### Product Brief

PB016509-0508



### Product Block Diagram

|                                   |                            |                               |
|-----------------------------------|----------------------------|-------------------------------|
| 1-8 KB Flash                      | 256 B -1 KB RAM            | Up to 8 10-Bit ADC Channels   |
| Watchdog Timer with RC Oscillator | 5 MHz eZ8 <sup>™</sup> 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

Zilog's Z8 Encore! XP<sup>®</sup> Z8F0823 Series Flash microcontrollers are based on Zilog's 8-bit eZ8 CPU core. The Z8 Encore! XP F0823 Series set a new standard of performance and on-chip peripherals.

The Z8 Encore! XP F0823 Series support 8 KB of non-volatile Flash memory and 1 KB on-chip register RAM. The Z8 Encore! Z8F0823 Series features up to 8 single-ended channels of 10-bit analog-to-digital conversion.

These devices include two enhanced 16-bit reloadable timers featuring generation of PWM signals, and Capture and Compare capability.

Up to 18 vectored interrupts with 3 levels of programmable priorities, providing increased application flexibility.

The Z8 Encore! XP F0823 Series features an on-chip internal precision oscillator (IPO) as a trimmable clock source that requires no external components. The IPO features the output frequency of either 5 MHz or 32 kHz.

The full-duplex UART provides serial communication and IrDA encoding and decoding capability. The UART baud rate generator (BRG) can be configured and used as a basic 16-bit timer. The new single-pin on chip debugger and programming interface simplifies code development and allows for easy in-circuit programming.

### Features

Key features of Z8 Encore! XP F0823 Series include:

- 5 MHz eZ8 CPU core
- Up to 8 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
- Two 16-bit timers with capture, compare, and PWM capabilities

- Watchdog Timer (WDT) with dedicated internal RC oscillator
- 6 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 (OCD)
- Voltage Brownout Protection (VBO)
- Power-On Reset (POR)
- Internal Precision Oscillator with output frequency of either 5 MHz or 32 kHz
- 2.7 V 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, Zilog's latest 8-bit CPU, 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

## Development Kit

The Z8 Encore! XP F0823 Series uses the Z8 Encore! XP F08xA Series Development Kit which includes:

### Hardware

- Z8 Encore! XP F08xA Series Development Board
- Smart Cable
- 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
- Z8 Encore! XP F0823 Series technical documentation (on CD-ROM):
  - Development Kit User Manual
  - ZDSII IDE User Manual
  - eZ8™ CPU User Manual
  - Product Specification
  - Product Brief

## Architecture

Figure 1 displays the Z8 Encore! XP F0823 Series block diagram.

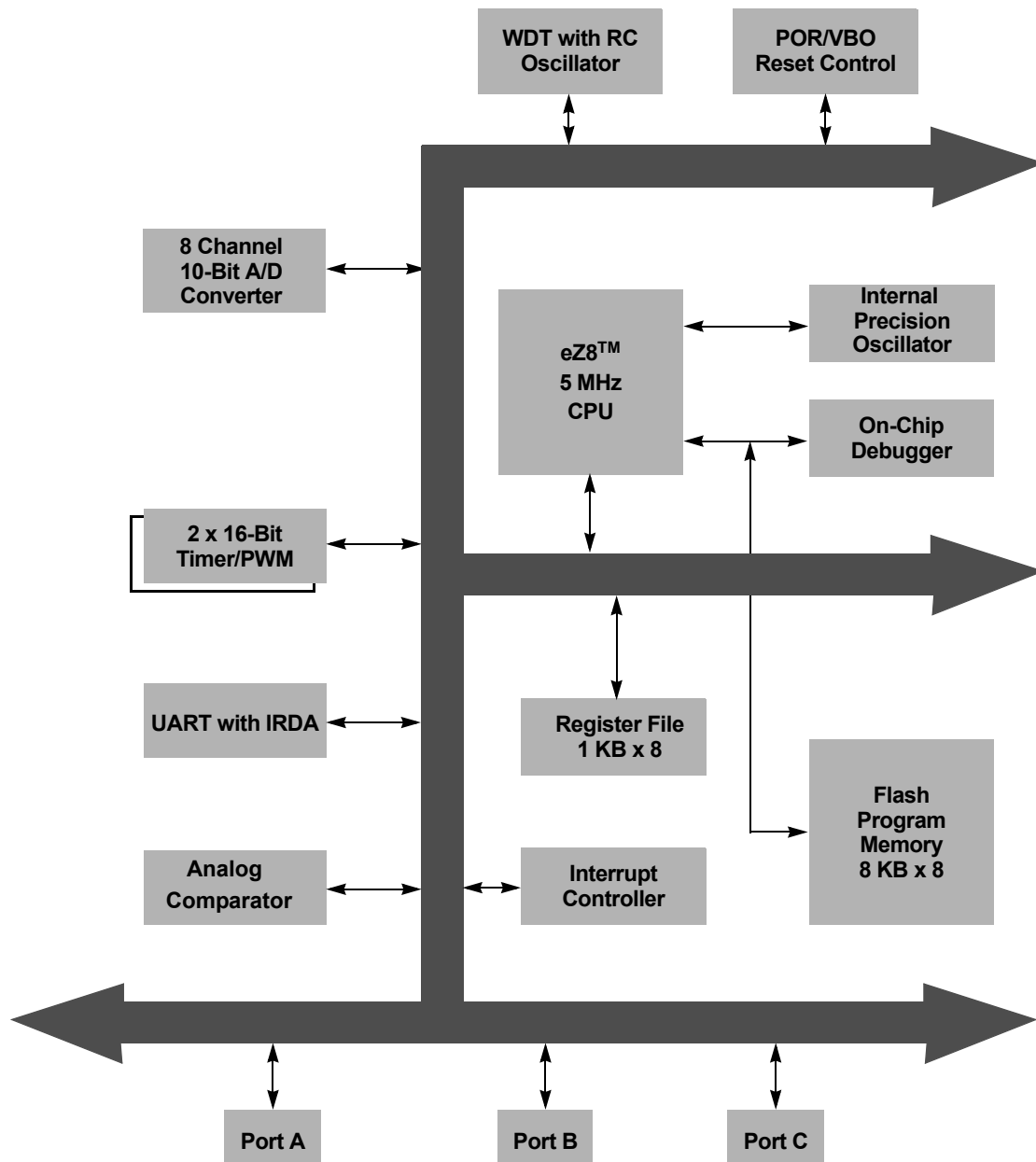


Figure 1. Z8 Encore! XP F0823 Series Block Diagram

## Ordering Information

Order the Z8 Encore! XP F0823 Series from Zilog®, using the following part numbers. For more information regarding ordering, contact your local Zilog sales office. The Zilog website ([www.zilog.com](http://www.zilog.com)) lists all regional offices and provides additional Z8 Encore! XP 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         |
|---------------------------------------------------------------------------------------|-------|------|-----------|------------|---------------------|---------------------|----------------|------------|---------------------|
| <b>Z8 Encore! XP F0823 Series with 8 KB Flash, 10-Bit Analog-to-Digital Converter</b> |       |      |           |            |                     |                     |                |            |                     |
| <b>Standard Temperature: 0 °C to +70 °C</b>                                           |       |      |           |            |                     |                     |                |            |                     |
| Z8F0823PB005SC                                                                        | 8 KB  | 1 KB | 6         | 12         | 2                   | 4                   | 1              | 1          | PDIP 8-pin package  |
| Z8F0823QB005SC                                                                        | 8 KB  | 1 KB | 6         | 12         | 2                   | 4                   | 1              | 1          | QFN 8-pin package   |
| Z8F0823SB005SC                                                                        | 8 KB  | 1 KB | 6         | 12         | 2                   | 4                   | 1              | 1          | SOIC 8-pin package  |
| Z8F0823SH005SC                                                                        | 8 KB  | 1 KB | 16        | 18         | 2                   | 7                   | 1              | 1          | SOIC 20-pin package |
| Z8F0823HH005SC                                                                        | 8 KB  | 1 KB | 16        | 18         | 2                   | 7                   | 1              | 1          | SSOP 20-pin package |
| Z8F0823PH005SC                                                                        | 8 KB  | 1 KB | 16        | 18         | 2                   | 7                   | 1              | 1          | PDIP 20-pin package |
| Z8F0823SJ005SC                                                                        | 8 KB  | 1 KB | 22        | 18         | 2                   | 8                   | 1              | 1          | SOIC 28-pin package |
| Z8F0823HJ005SC                                                                        | 8 KB  | 1 KB | 22        | 18         | 2                   | 8                   | 1              | 1          | SSOP 28-pin package |
| Z8F0823PJ005SC                                                                        | 8 KB  | 1 KB | 22        | 18         | 2                   | 8                   | 1              | 1          | PDIP 28-pin package |
| <b>Extended Temperature: -40 °C to +105 °C</b>                                        |       |      |           |            |                     |                     |                |            |                     |
| Z8F0823PB005EC                                                                        | 8 KB  | 1 KB | 6         | 12         | 2                   | 4                   | 1              | 1          | PDIP 8-pin package  |
| Z8F0823QB005EC                                                                        | 8 KB  | 1 KB | 6         | 12         | 2                   | 4                   | 1              | 1          | QFN 8-pin package   |
| Z8F0823SB005EC                                                                        | 8 KB  | 1 KB | 6         | 12         | 2                   | 4                   | 1              | 1          | SOIC 8-pin package  |
| Z8F0823SH005EC                                                                        | 8 KB  | 1 KB | 16        | 18         | 2                   | 7                   | 1              | 1          | SOIC 20-pin package |
| Z8F0823HH005EC                                                                        | 8 KB  | 1 KB | 16        | 18         | 2                   | 7                   | 1              | 1          | SSOP 20-pin package |
| Z8F0823PH005EC                                                                        | 8 KB  | 1 KB | 16        | 18         | 2                   | 7                   | 1              | 1          | PDIP 20-pin package |
| Z8F0823SJ005EC                                                                        | 8 KB  | 1 KB | 22        | 18         | 2                   | 8                   | 1              | 1          | SOIC 28-pin package |
| Z8F0823HJ005EC                                                                        | 8 KB  | 1 KB | 22        | 18         | 2                   | 8                   | 1              | 1          | SSOP 28-pin package |
| Z8F0823PJ005EC                                                                        | 8 KB  | 1 KB | 22        | 18         | 2                   | 8                   | 1              | 1          | PDIP 28-pin package |
| <b>Note:</b> 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         |
|--------------------------------------------------------|-------|------|-----------|------------|---------------------|---------------------|----------------|------------|---------------------|
| <b>Z8 Encore! XP F0823 Series with 8 KB Flash</b>      |       |      |           |            |                     |                     |                |            |                     |
| <b>Standard Temperature: 0 °C to +70 °C</b>            |       |      |           |            |                     |                     |                |            |                     |
| Z8F0813PB005SC                                         | 8 KB  | 1 KB | 6         | 12         | 2                   | 0                   | 1              | 1          | PDIP 8-pin package  |
| Z8F0813QB005SC                                         | 8 KB  | 1 KB | 6         | 12         | 2                   | 0                   | 1              | 1          | QFN 8-pin package   |
| Z8F0813SB005SC                                         | 8 KB  | 1 KB | 6         | 12         | 2                   | 0                   | 1              | 1          | SOIC 8-pin package  |
| Z8F0813SH005SC                                         | 8 KB  | 1 KB | 16        | 18         | 2                   | 0                   | 1              | 1          | SOIC 20-pin package |
| Z8F0813HH005SC                                         | 8 KB  | 1 KB | 16        | 18         | 2                   | 0                   | 1              | 1          | SSOP 20-pin package |
| Z8F0813PH005SC                                         | 8 KB  | 1 KB | 16        | 18         | 2                   | 0                   | 1              | 1          | PDIP 20-pin package |
| Z8F0813SJ005SC                                         | 8 KB  | 1 KB | 24        | 18         | 2                   | 0                   | 1              | 1          | SOIC 28-pin package |
| Z8F0813HJ005SC                                         | 8 KB  | 1 KB | 24        | 18         | 2                   | 0                   | 1              | 1          | SSOP 28-pin package |
| Z8F0813PJ005SC                                         | 8 KB  | 1 KB | 24        | 18         | 2                   | 0                   | 1              | 1          | PDIP 28-pin package |
| <b>Extended Temperature: –40 °C to +105 °C</b>         |       |      |           |            |                     |                     |                |            |                     |
| Z8F0813PB005EC                                         | 8 KB  | 1 KB | 6         | 12         | 2                   | 0                   | 1              | 1          | PDIP 8-pin package  |
| Z8F0813QB005EC                                         | 8 KB  | 1 KB | 6         | 12         | 2                   | 0                   | 1              | 1          | QFN 8-pin package   |
| Z8F0813SB005EC                                         | 8 KB  | 1 KB | 6         | 12         | 2                   | 0                   | 1              | 1          | SOIC 8-pin package  |
| Z8F0813SH005EC                                         | 8 KB  | 1 KB | 16        | 18         | 2                   | 0                   | 1              | 1          | SOIC 20-pin package |
| Z8F0813HH005EC                                         | 8 KB  | 1 KB | 16        | 18         | 2                   | 0                   | 1              | 1          | SSOP 20-pin package |
| Z8F0813PH005EC                                         | 8 KB  | 1 KB | 16        | 18         | 2                   | 0                   | 1              | 1          | PDIP 20-pin package |
| Z8F0813SJ005EC                                         | 8 KB  | 1 KB | 24        | 18         | 2                   | 0                   | 1              | 1          | SOIC 28-pin package |
| Z8F0813HJ005EC                                         | 8 KB  | 1 KB | 24        | 18         | 2                   | 0                   | 1              | 1          | SSOP 28-pin package |
| Z8F0813PJ005EC                                         | 8 KB  | 1 KB | 24        | 18         | 2                   | 0                   | 1              | 1          | PDIP 28-pin package |
| <b>Note:</b> 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         |
|---------------------------------------------------------------------------------------|-------|------|-----------|------------|---------------------|---------------------|----------------|------------|---------------------|
| <b>Z8 Encore! XP F0823 Series with 4 KB Flash, 10-Bit Analog-to-Digital Converter</b> |       |      |           |            |                     |                     |                |            |                     |
| <b>Standard Temperature: 0 °C to +70 °C</b>                                           |       |      |           |            |                     |                     |                |            |                     |
| 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 |
| <b>Extended Temperature: –40 °C to +105 °C</b>                                        |       |      |           |            |                     |                     |                |            |                     |
| 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 |
| <b>Note:</b> 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         |
|--------------------------------------------------------|-------|------|-----------|------------|---------------------|---------------------|----------------|------------|---------------------|
| <b>Z8 Encore! XP F0823 Series with 4 KB Flash</b>      |       |      |           |            |                     |                     |                |            |                     |
| <b>Standard Temperature: 0 °C to +70 °C</b>            |       |      |           |            |                     |                     |                |            |                     |
| 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 |
| <b>Extended Temperature: –40 °C to +105 °C</b>         |       |      |           |            |                     |                     |                |            |                     |
| 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 |
| <b>Note:</b> Replace C with G for Lead-Free Packaging. |       |      |           |            |                     |                     |                |            |                     |

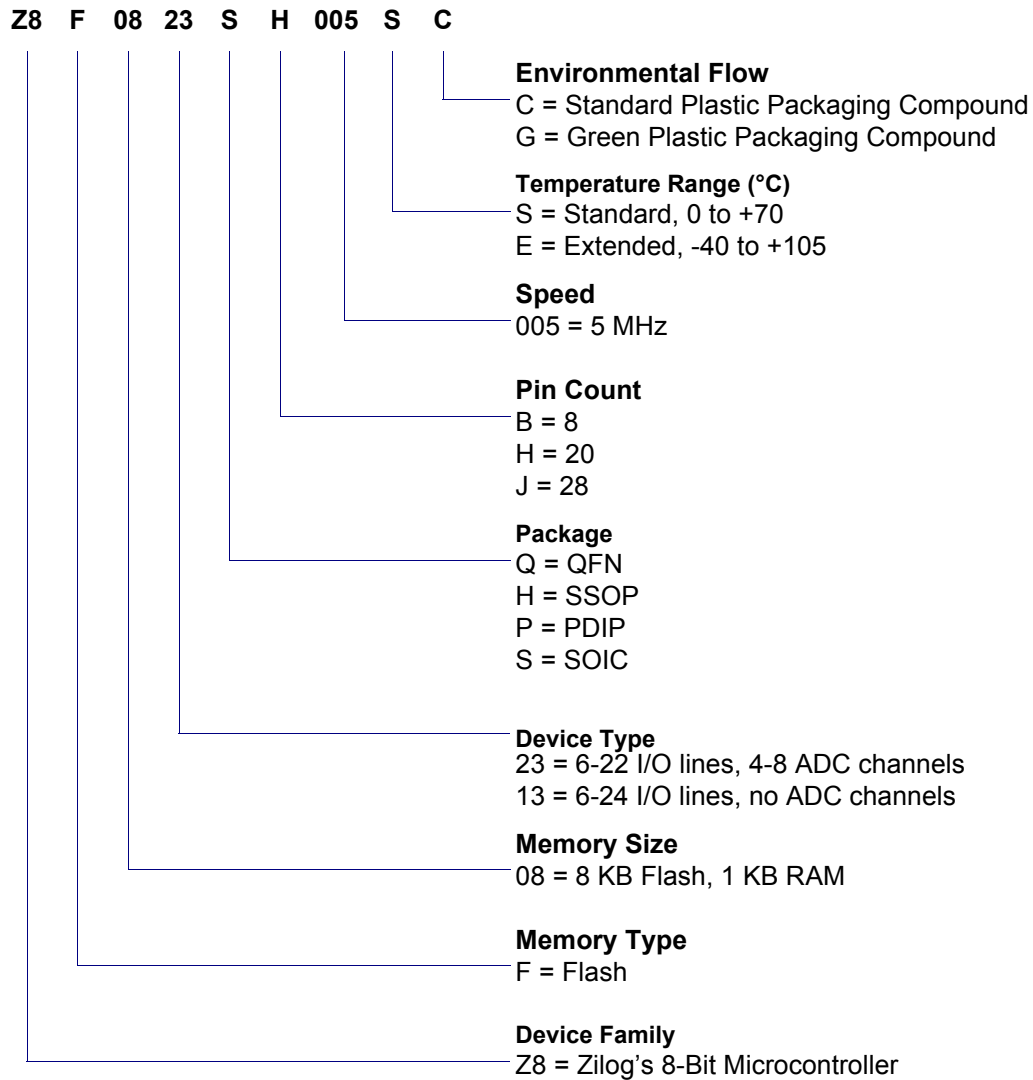
| Part Number                                                                           | Flash | RAM   | I/O Lines | Interrupts | 16-Bit Timers w/PWM | 10-Bit A/D Channels | UART with IrDA | Comparator | Description         |
|---------------------------------------------------------------------------------------|-------|-------|-----------|------------|---------------------|---------------------|----------------|------------|---------------------|
| <b>Z8 Encore! XP F0823 Series with 2 KB Flash, 10-Bit Analog-to-Digital Converter</b> |       |       |           |            |                     |                     |                |            |                     |
| <b>Standard Temperature: 0 °C to +70 °C</b>                                           |       |       |           |            |                     |                     |                |            |                     |
| 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 |
| <b>Extended Temperature: –40 °C to +105 °C</b>                                        |       |       |           |            |                     |                     |                |            |                     |
| 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 |
| <b>Note:</b> 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         |
|---------------------------------------------------------------------------------------|-------|-------|-----------|------------|---------------------|---------------------|----------------|------------|---------------------|
| <b>Z8 Encore! XP F0823 Series with 2 KB Flash, 10-Bit Analog-to-Digital Converter</b> |       |       |           |            |                     |                     |                |            |                     |
| <b>Standard Temperature: 0 °C to +70 °C</b>                                           |       |       |           |            |                     |                     |                |            |                     |
| 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 |
| <b>Extended Temperature: –40 °C to +105 °C</b>                                        |       |       |           |            |                     |                     |                |            |                     |
| 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 |
| <b>Note:</b> 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         |
|---------------------------------------------------------------------------------------|-------|-------|-----------|------------|---------------------|---------------------|----------------|------------|---------------------|
| <b>Z8 Encore! XP F0823 Series with 2 KB Flash, 10-Bit Analog-to-Digital Converter</b> |       |       |           |            |                     |                     |                |            |                     |
| <b>Standard Temperature: 0 °C to +70 °C</b>                                           |       |       |           |            |                     |                     |                |            |                     |
| 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 |
| <b>Extended Temperature: –40 °C to +105 °C</b>                                        |       |       |           |            |                     |                     |                |            |                     |
| 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 |
| <b>Note:</b> 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         |
|--------------------------------------------------------|---------------------------------------------|-------|-----------|------------|---------------------|---------------------|----------------|------------|---------------------|
| <b>Z8 Encore! XP F0823 Series with 1 KB Flash</b>      |                                             |       |           |            |                     |                     |                |            |                     |
| <b>Standard Temperature: 0 °C to +70 °C</b>            |                                             |       |           |            |                     |                     |                |            |                     |
| 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 |
| <b>Extended Temperature: –40 °C to +105 °C</b>         |                                             |       |           |            |                     |                     |                |            |                     |
| 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 |
| <b>Note:</b> Replace C with G for Lead-Free Packaging. |                                             |       |           |            |                     |                     |                |            |                     |
| Z8F08A28100KITG                                        | 20-pin and 28-pin Development Kit           |       |           |            |                     |                     |                |            |                     |
| Z8F04A08100KITG                                        | 8-pin Development Kit                       |       |           |            |                     |                     |                |            |                     |
| ZUSBSC00100ZACG                                        | USB Smart Cable Accessory Kit               |       |           |            |                     |                     |                |            |                     |
| ZUSBOPTSC01ZACG                                        | Opto-isolated USB Smart Cable Accessory Kit |       |           |            |                     |                     |                |            |                     |
| ZENETSC0100ZACG                                        | Ethernet Smart Cable Accessory Kit          |       |           |            |                     |                     |                |            |                     |

## Part Number Suffix Designations





**Warning:** DO NOT USE IN LIFE SUPPORT

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