## E·XFL

#### Zilog - Z8F0113SH005SG2156 Datasheet



Welcome to E-XFL.COM

#### 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 "<u>Embedded -</u> <u>Microcontrollers</u>"

#### Details

Product StatusActiveCore ProcessoreZ8Core Size8-BitSpeed5MHzConnectivityIrDA, UART/USARTPeripheralsBrown-out Detect/Reset, LED, POR, PWM, WDTNumber of I/O16Program Memory Size1KB (1K x 8)Program Memory TypeFLASHEEPROM Size-RAM Size256 x 8Voltage - Supply (Vcc/Vdd)2.7V ~ 3.6VData Converters-Oscillator TypeInternal
Core Size8-BitSpeed5MHzConnectivityIrDA, UART/USARTPeripheralsBrown-out Detect/Reset, LED, POR, PWM, WDTNumber of I/O16Program Memory Size1KB (1K x 8)Program Memory TypeFLASHEEPROM Size-RAM Size256 x 8Voltage - Supply (Vcc/Vdd)2.7V ~ 3.6VData Converters-
Speed5MHzConnectivityIrDA, UART/USARTPeripheralsBrown-out Detect/Reset, LED, POR, PWM, WDTNumber of I/O16Program Memory Size1KB (1K x 8)Program Memory TypeFLASHEEPROM Size-RAM Size256 x 8Voltage - Supply (Vcc/Vdd)2.7V ~ 3.6VData Converters-
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Program Memory TypeFLASHEEPROM Size-RAM Size256 x 8Voltage - Supply (Vcc/Vdd)2.7V ~ 3.6VData Converters-
EEPROM Size -   RAM Size 256 x 8   Voltage - Supply (Vcc/Vdd) 2.7V ~ 3.6V   Data Converters -
RAM Size256 x 8Voltage - Supply (Vcc/Vdd)2.7V ~ 3.6VData Converters-
Voltage - Supply (Vcc/Vdd)2.7V ~ 3.6VData Converters-
Data Converters -
Oscillator Type Internal
Operating Temperature 0°C ~ 70°C (TA)
Mounting Type Surface Mount
Package / Case20-SOIC (0.295", 7.50mm Width)
Supplier Device Package 20-SOIC
Purchase URL https://www.e-xfl.com/product-detail/zilog/z8f0113sh005sg2156

Email: info@E-XFL.COM

Address: Room A, 16/F, Full Win Commercial Centre, 573 Nathan Road, Mongkok, Hong Kong

## Zilog<sup>High-Performance 8-Bit Microcontrollers</sup> 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	Two 16-Bit Timers/PWM							
Analog Comparator	eZ8 <sup>™</sup> CPU	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.

Z8 SEncore! XP® Flash Microcontrollers

The Z8 Encore! XP F0823 Series features an onchip 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

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- 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 Vtolerant 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<sup>™</sup>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<sup>®</sup> 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!<sup>®</sup> IDE with ANSI C-Compiler
- Sample code
- Document browser
- Acrobat Reader<sup>®</sup>

### **Documentation**

- Quick Start Guide
- Z8 Encore! XP F0823 Series technical documentation (on CD-ROM):
  - Development Kit User Manual
  - ZDSII IDE User Manual
  - eZ8<sup>TM</sup> CPU User Manual
  - Product Specification
  - Product Brief

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## Architecture

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

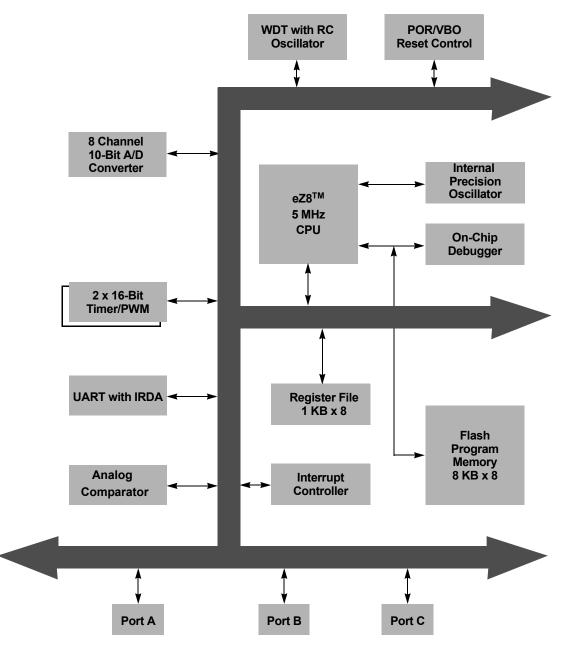


Figure 1. Z8 Encore! XP F0823 Series Block Diagram

## **Ordering Information**

Order the Z8 Encore! XP F0823 Series from Zilog<sup>®</sup>, using the following part numbers. For more information regarding ordering, contact your local Zilog sales office. The Zilog website (<u>www.zilog.com</u>) 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		
Z8 Encore! XP F0823 Series with 8 KB Flash, 10-Bit Analog-to-Digital Converter											
Standard Temperature: 0 °C to +70 °C											
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		
Extended Temperatu	re: -40 °C	to +105 °	C								
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		
Note: Replace C with G	for Lead-Fre	ee Packag	ing.								

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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! XP F0823	Series wi	th 8 KB I	lash								
Standard Temperature: 0 °C to +70 °C											
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		
Extended Temperatu	re: –40 °C	to +105	°C								
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		
Note: Replace C with G	for Lead-Fre	e Packag	ing.								

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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! XP F0823	Series wi	th 4 KB F	-lash, <sup>-</sup>	10-Bit /	Analo	g-to-l	Digita	l Con	verter		
Standard Temperature: 0 °C 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 Temperatu	re: –40 °C	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		
Note: Replace C with G	for Lead-Fre	ee Packag	ing.								

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! XP F0823 Series with 4 KB Flash Standard Temperature: 0 °C 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 Temperatu	re: –40 °C	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	
Note: Replace C with G	for Lead-Fre	ee Packag	ing.							

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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! XP F0823	Series w	ith 2 KB F	lash, ʻ	10-Bit /	Analo	g-to-l	Digita	l Con	verter		
Standard Temperature: 0 °C 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		
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Z8F0223PB005EC	2 KB	512 B	6	12	2	4	1	1	PDIP 8-pin package		
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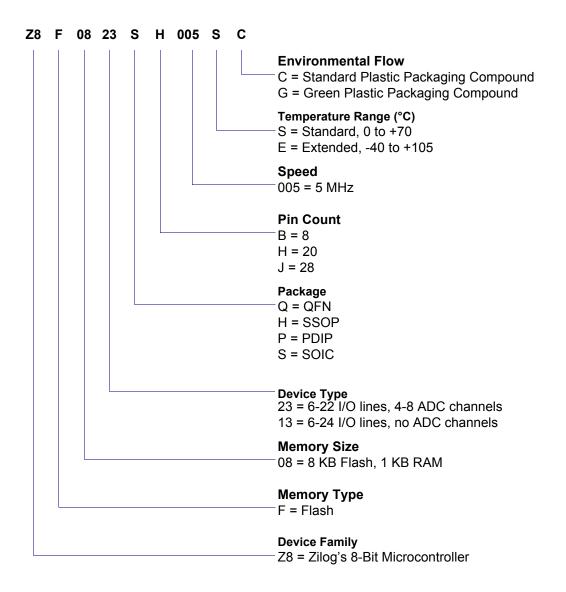
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Part Number	Flash	RAM	I/O Lines	Interrupts	16-Bit Timers w/PWM	10-Bit A/D Channels	UART with IrDA	Comparator	Description		
Z8 Encore! XP F0823	Series w	ith 2 KB F	lash, ʻ	10-Bit /	Analo	g-to-I	Digita	l Con	verter		
Standard Temperature: 0 °C to +70 °C											
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Z8F0223QB005SC	2 KB	512 B	6	12	2	4	1	1	QFN 8-pin package		
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Z8F0223QB005EC	2 KB	512 B	6	12	2	4	1	1	QFN 8-pin package		
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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		
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Z8F0223PJ005EC	2 KB	512 B	22	18	2	8	1	1	PDIP 28-pin package		
Note: Replace C with G	for Lead-Fr	ee Packagi	ing.								

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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! XP F0823	Series w	ith 2 KB F	lash, ʻ	10-Bit /	Analo	g-to-I	Digita	l Con	verter		
Standard Temperature: 0 °C to +70 °C											
Z8F0223PB005SC	2 KB	512 B	6	12	2	4	1	1	PDIP 8-pin package		
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Z8F0223SH005SC	2 KB	512 B	16	18	2	7	1	1	SOIC 20-pin package		
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Z8F0223PJ005EC	2 KB	512 B	22	18	2	8	1	1	PDIP 28-pin package		
Note: Replace C with G	for Lead-Fr	ee Packagi	ing.								

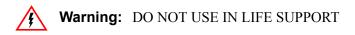
ັອດ ພິສິ ກັບ ກັບ ກັບ ກັບ ກັບ ກັບ ກັບ ກັບ ກັບ ກັບ	Flash	We We We We We We We We We We We We We W	I/O Lines	Interrupts	16-Bit Timers w/PWM	10-Bit A/D Channels	UART with IrDA	Comparator	Description
			lasn						
Standard Temperature Z8F0113PB005SC			6	10	2	0	1	1	
	1 KB	256 B		12					PDIP 8-pin package
Z8F0113QB005SC	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 256 B	16	18	2	0	1	1	SOIC 20-pin package
Z8F0113HH005SC	1 KB		16	18	2	0	1	1	SSOP 20-pin package
Z8F0113PH005SC Z8F0113SJ005SC	1 KB	256 B 256 B	16	18	2	0	1	1	PDIP 20-pin package
	1 KB		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									
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
Note: Replace C with G fo	r Lead-F	ree Packagi	ng.						
Z8F08A28100KITG		20-pin ar	id 28-p	in Deve	elopm	ent Ki	t		
Z8F04A08100KITG		8-pin Dev	/elopm	ent Kit					
ZUSBSC00100ZACG		USB Sma	art Cab	le Acce	essory	/ Kit			
ZUSBOPTSC01ZACG		Opto-isol	ated U	SB Sm	art Ca	ble A	ccess	ory K	it
ZENETSC0100ZACG		Ethernet	Smart	Cable	Acces	sory k	Kit		

## <mark>z</mark>ilog<sup>°</sup>

### **Part Number Suffix Designations**



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