

zilog® High Performance 8-Bit Microcontrollers

Z8 Encore! XP® F64XX Series

Product Brief

PB012407-0308



Product Block Diagram

16–64 KB Flash	2–4 KB RAM	Up to 12 Channels 10-Bit ADC
Four 16-Bit Timers/PWM	20 MHz eZ8™ CPU	3-Channel DMA
Watchdog Timer with RC Oscillator		POR/VBO and Reset Control
SPI, I ² C, and 2 UARTs with IrDA	On-Chip Debugger	Crystal/RC Oscillator
Up to 60 General-Purpose I/O Pins		

Overview

Zilog's Z8 Encore! XP® F64XX Series Flash microcontrollers are based on Zilog's eZ8 CPU. The Z8 Encore! XP F64XX Series set a new standard for performance and on-chip peripherals.

The Z8 Encore! XP F64XX Series support up to 64 KB of Flash program memory and 4 KB register RAM.

The Z8 Encore! XP F64XX Series feature up to twelve channels of 10-bit A/D conversion for measuring analog signals.

These devices include up to four enhanced 16-bit timer blocks featuring PWMs and Capture and Compare.

Up to 24 vectored interrupts with programmable priorities provide increased application flexibility.

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

Two full-duplex UARTs provides serial communications and IrDA encoding and decoding capability. SPI and I²C ports allow easy incorporation into any system.

Features

Key features of Z8 Encore! XP F64XX Series include:

- 20 MHz eZ8 CPU core
- Up to 64 KB Flash memory with in-circuit programming capability (Flash only)
- Up to 4 KB register RAM
- Up to twelve channels 10-bit Analog-to-Digital Converter (ADC)
- Two full-duplex 9-bit UARTs with bus transceiver Driver Enable Control
- Inter-Integrated Circuit (I²C)
- Serial Peripheral Interface (SPI)
- Infrared Data Association (IrDA)-compliant infrared encoder/decoders
- Up to four 16-bit timers with capture, compare, and PWM capability
- Watchdog Timer (WDT) with internal RC oscillator
- 3-channel DMA
- Up to 60 I/O pins depending on package
- Up to 24 interrupts with configurable priority
- On-Chip Debugger (OCD)
- Voltage Brownout Protection (VBO)
- Power-On Reset (POR)

- Crystal oscillator with three power settings and external RC network option
- 3.0 V to 3.6 V operating voltage with 5 V-tolerant inputs
- 40-, 44-, 64-, 68- and 80-pin packages
- 0 °C to +70 °C standard temperature, –40 °C to +105 °C extended temperature, and +125 °C automotive/industrial temperature operating ranges

eZ8™ CPU Features

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
- 2-9 clock cycles per instruction

Development Kit

The Z8 Encore! XP F64XX Series Development Kit includes the following:

Hardware

- Z8 Encore! XP F64XX 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 F64XX Series technical documentation (on CD-ROM)

Architecture

Figure 1 displays the Z8 Encore! XP F64XX Series block diagram.

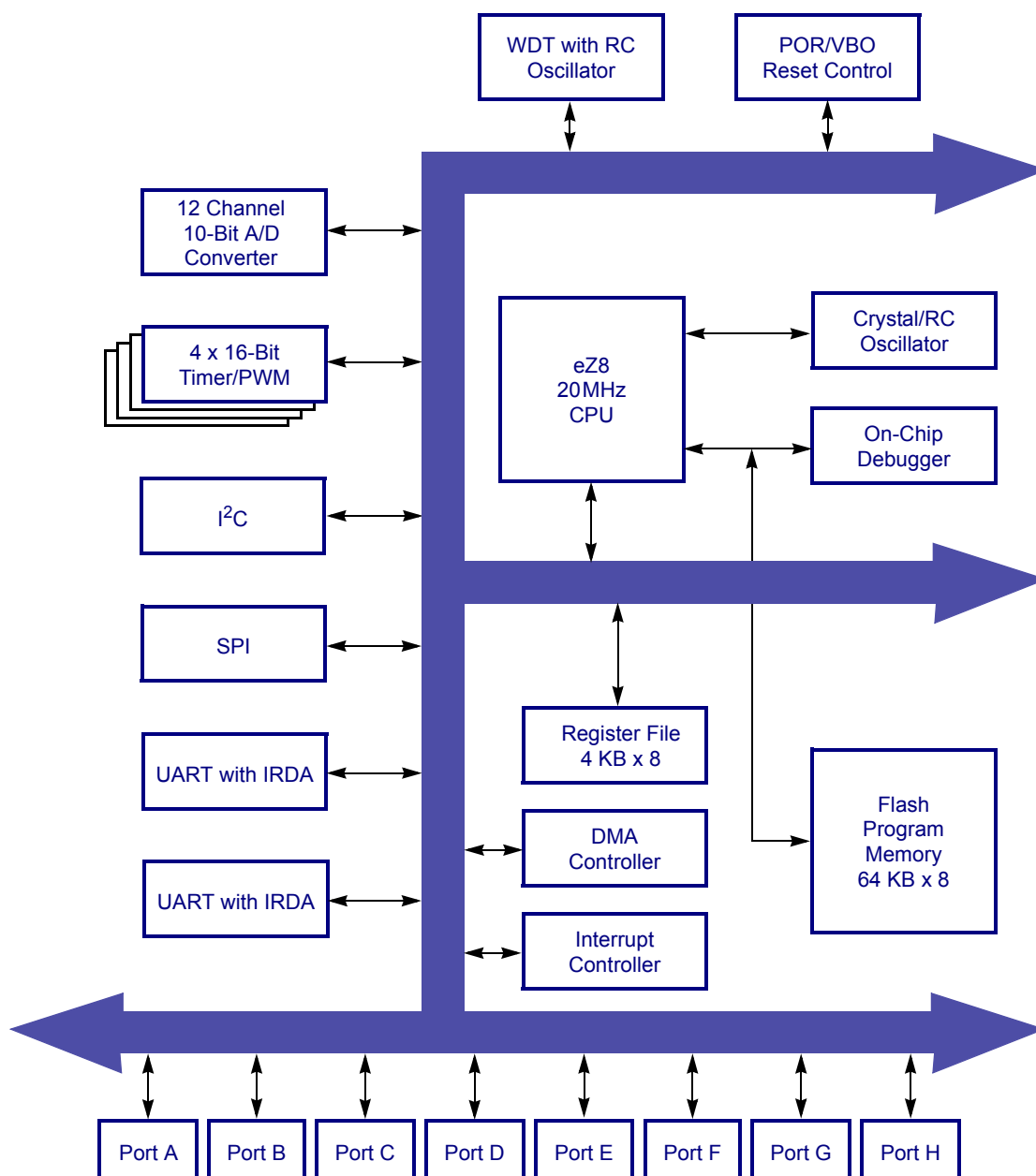


Figure 1. Z8 Encore! XP F64XX Series Block Diagram

Ordering Information

Order the Z8 Encore! XP F64XX 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) 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	I ² C	SPI	UARTs with IrDA	Description
Z8F642x with 64 KB Flash, 10-Bit Analog-to-Digital Converter										
Standard Temperature: 0 °C to 70 °C										
Z8F6421PM020SC	64 KB	4 KB	29	23	3	8	1	1	2	PDIP 40-pin package
Z8F6421AN020SC	64 KB	4 KB	31	23	3	8	1	1	2	LQFP 44-pin package
Z8F6421VN020SC	64 KB	4 KB	31	23	3	8	1	1	2	PLCC 44-pin package
Z8F6422AR020SC	64 KB	4 KB	46	24	4	12	1	1	2	LQFP 64-pin package
Z8F6422VS020SC	64 KB	4 KB	46	24	4	12	1	1	2	PLCC 68-pin package
Z8F6423FT020SC	64 KB	4 KB	60	24	4	12	1	1	2	QFP 80-pin package
Extended Temperature: -40 °C to +105 °C										
Z8F6421PM020EC	64 KB	4 KB	29	23	3	8	1	1	2	PDIP 40-pin package
Z8F6421AN020EC	64 KB	4 KB	31	23	3	8	1	1	2	LQFP 44-pin package
Z8F6421VN020EC	64 KB	4 KB	31	23	3	8	1	1	2	PLCC 44-pin package
Z8F6422AR020EC	64 KB	4 KB	46	24	4	12	1	1	2	LQFP 64-pin package
Z8F6422VS020EC	64 KB	4 KB	46	24	4	12	1	1	2	PLCC 68-pin package
Z8F6423FT020EC	64 KB	4 KB	60	24	4	12	1	1	2	QFP 80-pin package
Automotive/Industrial Temperature: -40 °C to +125 °C										
Z8F6421PM020AC	64 KB	4 KB	29	23	3	8	1	1	2	PDIP 40-pin package
Z8F6421AN020AC	64 KB	4 KB	31	23	3	8	1	1	2	LQFP 44-pin package
Z8F6421VN020AC	64 KB	4 KB	31	23	3	8	1	1	2	PLCC 44-pin package
Z8F6422AR020AC	64 KB	4 KB	46	24	4	12	1	1	2	LQFP 64-pin package
Z8F6422VS020AC	64 KB	4 KB	46	24	4	12	1	1	2	PLCC 68-pin package
Z8F6423FT020AC	64 KB	4 KB	60	24	4	12	1	1	2	QFP 80-pin package
Note: 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	I ² C	SPI	UARTs with IrDA	Description
Z8F482x with 48 KB Flash, 10-Bit Analog-to-Digital Converter										
Standard Temperature: 0 °C to 70 °C										
Z8F4821PM020SC	48 KB	4 KB	29	23	3	8	1	1	2	PDIP 40-pin package
Z8F4821AN020SC	48 KB	4 KB	31	23	3	8	1	1	2	LQFP 44-pin package
Z8F4821VN020SC	48 KB	4 KB	31	23	3	8	1	1	2	PLCC 44-pin package
Z8F4822AR020SC	48 KB	4 KB	46	24	4	12	1	1	2	LQFP 64-pin package
Z8F4822VS020SC	48 KB	4 KB	46	24	4	12	1	1	2	PLCC 68-pin package
Z8F4823FT020SC	48 KB	4 KB	60	24	4	12	1	1	2	QFP 80-pin package
Extended Temperature: –40 °C to +105 °C										
Z8F4821PM020EC	48 KB	4 KB	29	23	3	8	1	1	2	PDIP 40-pin package
Z8F4821AN020EC	48 KB	4 KB	31	23	3	8	1	1	2	LQFP 44-pin package
Z8F4821VN020EC	48 KB	4 KB	31	23	3	8	1	1	2	PLCC 44-pin package
Z8F4822AR020EC	48 KB	4 KB	46	24	4	12	1	1	2	LQFP 64-pin package
Z8F4822VS020EC	48 KB	4 KB	46	24	4	12	1	1	2	PLCC 68-pin package
Z8F4823FT020EC	48 KB	4 KB	60	24	4	12	1	1	2	QFP 80-pin package
Automotive/Industrial Temperature: –40 °C to +125 °C										
Z8F4821PM020AC	48 KB	4 KB	29	23	3	8	1	1	2	PDIP 40-pin package
Z8F4821AN020AC	48 KB	4 KB	31	23	3	8	1	1	2	LQFP 44-pin package
Z8F4821VN020AC	48 KB	4 KB	31	23	3	8	1	1	2	PLCC 44-pin package
Z8F4822AR020AC	48 KB	4 KB	46	24	4	12	1	1	2	LQFP 64-pin package
Z8F4822VS020AC	48 KB	4 KB	46	24	4	12	1	1	2	PLCC 68-pin package
Z8F4823FT020AC	48 KB	4 KB	60	24	4	12	1	1	2	QFP 80-pin package
Note: 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	I ² C	SPI	UARTs with IrDA	Description
Z8F322x with 32 KB Flash, 10-Bit Analog-to-Digital Converter										
Standard Temperature: 0 °C to 70 °C										
Z8F3221PM020SC	32 KB	2 KB	29	23	3	8	1	1	2	PDIP 40-pin package
Z8F3221AN020SC	32 KB	2 KB	31	23	3	8	1	1	2	LQFP 44-pin package
Z8F3221VN020SC	32 KB	2 KB	31	23	3	8	1	1	2	PLCC 44-pin package
Z8F3222AR020SC	32 KB	2 KB	46	24	4	12	1	1	2	LQFP 64-pin package
Z8F3222VS020SC	32 KB	2 KB	46	24	4	12	1	1	2	PLCC 68-pin package
Extended Temperature: –40 °C to +105 °C										
Z8F3221PM020EC	32 KB	2 KB	29	23	3	8	1	1	2	PDIP 40-pin package
Z8F3221AN020EC	32 KB	2 KB	31	23	3	8	1	1	2	LQFP 44-pin package
Z8F3221VN020EC	32 KB	2 KB	31	23	3	8	1	1	2	PLCC 44-pin package
Z8F3222AR020EC	32 KB	2 KB	46	24	4	12	1	1	2	LQFP 64-pin package
Z8F3222VS020EC	32 KB	2 KB	46	24	4	12	1	1	2	PLCC 68-pin package
Automotive/Industrial Temperature: –40 °C to +125 °C										
Z8F3221PM020AC	32 KB	2 KB	29	23	3	8	1	1	2	PDIP 40-pin package
Z8F3221AN020AC	32 KB	2 KB	31	23	3	8	1	1	2	LQFP 44-pin package
Z8F3221VN020AC	32 KB	2 KB	31	23	3	8	1	1	2	PLCC 44-pin package
Z8F3222AR020AC	32 KB	2 KB	46	24	4	12	1	1	2	LQFP 64-pin package
Z8F3222VS020AC	32 KB	2 KB	46	24	4	12	1	1	2	PLCC 68-pin package
Note: 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	I ² C	SPI	UARTs with IrDA	Description
Z8F242x with 24 KB Flash, 10-Bit Analog-to-Digital Converter										
Standard Temperature: 0 °C to 70 °C										
Z8F2421PM020SC	24 KB	2 KB	29	23	3	8	1	1	2	PDIP 40-pin package
Z8F2421AN020SC	24 KB	2 KB	31	23	3	8	1	1	2	LQFP 44-pin package
Z8F2421VN020SC	24 KB	2 KB	31	23	3	8	1	1	2	PLCC 44-pin package
Z8F2422AR020SC	24 KB	2 KB	46	24	4	12	1	1	2	LQFP 64-pin package
Z8F2422VS020SC	24 KB	2 KB	46	24	4	12	1	1	2	PLCC 68-pin package
Extended Temperature: –40 °C to +105 °C										
Z8F2421PM020EC	24 KB	2 KB	29	23	3	8	1	1	2	PDIP 40-pin package
Z8F2421AN020EC	24 KB	2 KB	31	23	3	8	1	1	2	LQFP 44-pin package
Z8F2421VN020EC	24 KB	2 KB	31	23	3	8	1	1	2	PLCC 44-pin package
Z8F2422AR020EC	24 KB	2 KB	46	24	4	12	1	1	2	LQFP 64-pin package
Z8F2422VS020EC	24 KB	2 KB	46	24	4	12	1	1	2	PLCC 68-pin package
Automotive/Industrial Temperature: –40 °C to +125 °C										
Z8F2421PM020AC	24 KB	2 KB	29	23	3	8	1	1	2	PDIP 40-pin package
Z8F2421AN020AC	24 KB	2 KB	31	23	3	8	1	1	2	LQFP 44-pin package
Z8F2421VN020AC	24 KB	2 KB	31	23	3	8	1	1	2	PLCC 44-pin package
Z8F2422AR020AC	24 KB	2 KB	46	24	4	12	1	1	2	LQFP 64-pin package
Z8F2422VS020AC	24 KB	2 KB	46	24	4	12	1	1	2	PLCC 68-pin package
Note: 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	I ² C	SPI	UARTs with IrDA	Description
Z8F162x with 16 KB Flash, 10-Bit Analog-to-Digital Converter										
Standard Temperature: 0 °C to 70 °C										
Z8F1621PM020SC	16 KB	2 KB	29	23	3	8	1	1	2	PDIP 40-pin package
Z8F1621AN020SC	16 KB	2 KB	31	23	3	8	1	1	2	LQFP 44-pin package
Z8F1621VN020SC	16 KB	2 KB	31	23	3	8	1	1	2	PLCC 44-pin package
Z8F1622AR020SC	16 KB	2 KB	46	24	4	12	1	1	2	LQFP 64-pin package
Z8F1622VS020SC	16 KB	2 KB	46	24	4	12	1	1	2	PLCC 68-pin package
Extended Temperature: –40 °C to +105 °C										
Z8F1621PM020EC	16 KB	2 KB	29	23	3	8	1	1	2	PDIP 40-pin package
Z8F1621AN020EC	16 KB	2 KB	31	23	3	8	1	1	2	LQFP 44-pin package
Z8F1621VN020EC	16 KB	2 KB	31	23	3	8	1	1	2	PLCC 44-pin package
Z8F1622AR020EC	16 KB	2 KB	46	24	4	12	1	1	2	LQFP 64-pin package
Z8F1622VS020EC	16 KB	2 KB	46	24	4	12	1	1	2	PLCC 68-pin package
Automotive/Industrial Temperature: –40 °C to +125 °C										
Z8F1621PM020AC	16 KB	2 KB	29	23	3	8	1	1	2	PDIP 40-pin package
Z8F1621AN020AC	16 KB	2 KB	31	23	3	8	1	1	2	LQFP 44-pin package
Z8F1621VN020AC	16 KB	2 KB	31	23	3	8	1	1	2	PLCC 44-pin package
Z8F1622AR020AC	16 KB	2 KB	46	24	4	12	1	1	2	LQFP 64-pin package
Z8F1622VS020AC	16 KB	2 KB	46	24	4	12	1	1	2	PLCC 68-pin package
Z8F64200100KITG	Development Kit									
ZUSBSC00100ZACG	USB Smart Cable Accessory Kit									
ZUSBOPTSC01ZACG	Opto-Isolated USB Smart Cable Accessory Kit									
ZENETSC0100ZACG	Ethernet Smart Cable Accessory Kit									
Note: Replace C with G for lead-free packaging.										

Part Number Suffix Designations

Z8	F	64	21	P	M	020	S	C	
									Environmental Flow
									C = Plastic Standard
									G = Lead Free Package
									Temperature Range (°C)
									S = Standard, 0 to 70
									E = Extended, -40 to +105
									A = Automotive/Industrial, -40 to +125
									Speed
									020 = 20 MHz
									Pin Count:
									M = 40 Pins
									N = 44 Pins
									R = 64 Pins
									S = 68 Pins
									T = 80 Pins
									Package
									A = LQFP
									F = QFP
									P = PDIP
									V = PLCC
									Device Type
									21 = Devices with 29 or 31 I/O Lines, 23 Interrupts, 3 Timers and 8 ADC channels
									22 = Devices with 46 I/O Lines, 24 Interrupts, 4 Timers and 12 ADC channels
									23 = Devices with 60 I/O Lines, 24 Interrupts, 4 Timers and 12 ADC channels
									Memory Size
									64 KB Flash, 4 KB RAM
									48 KB Flash, 4 KB RAM
									32 KB Flash, 2 KB RAM
									24 KB Flash, 2 KB RAM
									16 KB Flash, 2 KB RAM
									Memory Type
									F = Flash
									Device Family

Note: *Not all packages are available for all memory sizes. See [Ordering Information](#) for the packages available for your requirements.



Warning: DO NOT USE IN LIFE SUPPORT

LIFE SUPPORT POLICY

ZILOG'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS PRIOR WRITTEN APPROVAL OF THE PRESIDENT AND GENERAL COUNSEL OF ZILOG CORPORATION.

As used herein

Life support devices or systems are devices which (a) are intended for surgical implant into the body, or (b) support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in a significant injury to the user. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system or to affect its safety or effectiveness.

Document Disclaimer

©2008 by Zilog, Inc. All rights reserved. Information in this publication concerning the devices, applications, or technology described is intended to suggest possible uses and may be superseded. ZILOG, INC. DOES NOT ASSUME LIABILITY FOR OR PROVIDE A REPRESENTATION OF ACCURACY OF THE INFORMATION, DEVICES, OR TECHNOLOGY DESCRIBED IN THIS DOCUMENT. ZILOG ALSO DOES NOT ASSUME LIABILITY FOR INTELLECTUAL PROPERTY INFRINGEMENT RELATED IN ANY MANNER TO USE OF INFORMATION, DEVICES, OR TECHNOLOGY DESCRIBED HEREIN OR OTHERWISE. The information contained within this document has been verified according to the general principles of electrical and mechanical engineering.

Z8 Encore!, Z8 Encore! XP, and Z8 are registered trademarks of Zilog Inc. eZ8 is a trademark of Zilog Inc. All other product or service names are the property of their respective owners.