Z8 Encore! XP® F1680 Series

Flash Microcontroller Family

OVERVIEW

ZiLOG continues to expand the popular and award-winning Z8 Encore!® family with the new Z8 Encore! XP® F1680 Series of Flash microcontrollers. The F1680 Series is based on ZiLOG's 8-bit eZ8 CPU with many additional analog and digital features. This low-voltage, low-power, high performance, and feature-rich product is designed for applications including utility metering, safety and security detection, battery-charging, and supervisory applications.

Compared to its predecessor, Z8 Encore! XP® F1680 Series offers many new features such as ultra-wide 1.8 V to 3.6 V operating voltages, up to 1 KB Program RAM (PRAM), up to 8 channels of high-speed 10-bit Analog-to-Digital Converter (ADC) with 5 µs conversion time, Multi-Channel Timers, two UARTs with Local Interconnect Network (LIN), IrDA and an enhanced Serial Peripheral Interface (SPI) interface. This Series also features more memory of up to 24 KB Flash Program Memory and 2 KB Register RAM that provides superior design flexibility to cope with increasing system complexity.

The Z8 Encore! XP® F1680 Series also features a single-pin On-Chip Debugger (OCD) interface which can be connected through a USB smart cable or Opto-Isolated USB smart cable. This allows simplified code development and debug, as well as easy in-circuit programming when working with the development kit.

FEATURES

- 20 MHz 8-bit eZ8 CPU core with up to 10 MIPS performance
- Wide operation voltage: 1.8 V to 3.6 V
- Up to 24 KB Flash Program Memory with in-circuit programming capability
- 1 KB PRAM for program code shadowing
- Up to 2 KB Register RAM
- Up to 256 Bytes Non-Volatile Data Storage (NVDS)
- Up to 8-channel 10-bit ADC
- Internal Precision Oscillator (IPO) with +/-1% accuracy @ 25 °C and programmable clock output within the range of 43 kHz and 11 MHz
- 32 kHz secondary oscillator for timers
- On-chip Temperature Sensor
- Up to two on-chip analog comparators (20-pin and 28-pin packages have only one)
- On-chip Low-Power Operational (LPO) Amplifier
- Three enhanced 16-bit timers with Capture, Compare, and Pulse-Width Modulation (PWM) capabilities
- Two optional basic 16-bit timers with interrupt (shared with UARTs as Baud Rate Generator)
- One 16-bit Multi-Channel Timer with four capture/compare modules (44-pin package only)
- Watchdog Timer (WDT) with dedicated internal RC oscillator
- On-Chip Debugger
- Built-in Low-Voltage Detection (LVD) and Voltage Brownout (VBO) protection
- Power-On Reset (POR)
- Master/Slave I^2C interface
- Enhanced SPI (except 20-pin package)
- Up to thirty-seven 5 V-tolerant General-purpose Input/Output (GPIO) pins
- Two full-duplex, 9-bit UART ports with support of LIN protocol and Infrared Data Association (IrDA)
- 44-pin LQFP/QFN, 40-pin PDIP, and 28-pin/20-pin SOIC/SSOP/PDIP packages
- 0 °C to +70 °C (standard temperature) and -40 °C to +105 °C (extended temperature) operation ranges

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OUR SOLUTIONS TO YOUR DESIGN CHALLENGES

Ultra Low Power Consumption
The Z8 Encore! XP® F1680 Series supports operation from 1.8 V to 3.6 V, dramatically reducing chip power consumption. The on-chip PRAM can be used to shadow frequently executed program code such as Interrupt Service Routines (ISR) for additional power savings.

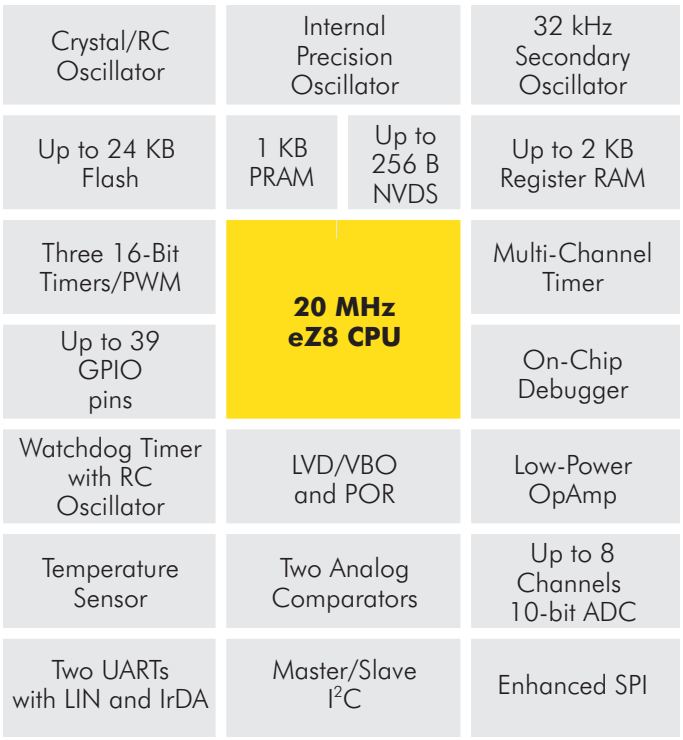
Fast Sampling of Signals
The high-speed, 10-bit Successive Approximation Register (SAR) ADC features a conversion time of less than 5 µs with up to 8 analog input sources running under internal or external voltage reference.

Design Flexibility
With up to 24 KB Flash memory, 1 KB PRAM, 2 KB Register RAM, 256 B NVDS, and many feature-rich peripheral functions including ADC, Temperature Sensor, Analog Comparator, Op-Amp, WDT/PWM, IPO, LVD/VBO, POR, LIN, I^2C, and SPI, the Z8 Encore! XP® F1680 Series provides superior design flexibility to cope with increasing system complexity.

System Cost
The highly integrated features of the Z8 Encore! XP® F1680 Series eliminates many external components normally seen on the system board lowering the BOM cost of your design.

Better Noise Immunization
In many applications, external signal noise is a serious issue interfering with the MCU's operation. The Z8 Encore! XP® F1680 Series has a built-in IPO and noise filter then improves noise immunity allowing the device to operate even in worst conditions.

Affordable & Efficient Tools
ZiLOG offers a comprehensive yet affordable design tool which is available with a free license of ANSI C-Compiler, ZDS II-Z8 Encore! XP® IDE, real-time debug port, and a USB smart cable for connecting PC to development kit. This kit allows you to quickly develop your system with the Z8 Encore! XP® F1680 Series for quick time-to-market.



Silicon Ordering Information

Device	Flash	NVDS	ADC	Package Types Supported
Z8F2480XX	24 KB	No	Yes	44-pin LQFP or QFN, 40-pin PDIP, and 28-pin/20-pin SOIC, SSOP, or PDIP
Z8F1680XX	16 KB	Yes	Yes	44-pin LQFP or QFN, 40-pin PDIP, and 28-pin/20-pin SOIC, SSOP or PDIP
Z8F0880XX	8 KB	Yes	Yes	44-pin LQFP or QFN, 40-pin PDIP, and 28-pin/20-pin SOIC, SSOP or PDIP

Development Tool Ordering Information

- Z8F16800128ZCOG: Z8 Encore! XP 28-pin Development Kit
- Z8F16800144ZCOG: Z8 Encore! XP Dual F1680 Development Kit
- ZUSBSC00100ZACG: USB Smart Cable Accessory Kit
- ZUSBOPTSC01ZACG: Opto-Isolated USB Smart Cable Accessory Kit

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