# E · K Finalog Devices Inc./Maxim Integrated - ZA9L0022NW1LSGA021 Datasheet



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"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 Status             | Obsolete   |
|----------------------------|--|
| Core Processor             | ARM9®  |
| Core Size                  | 16/32-Bit  |
| Speed                      | 180MHz   |
| Connectivity               | EBI/EMI, SPI, UART/USART   |
| Peripherals                | DMA, LCD, PWM, WDT   |
| Number of I/O              | 76   |
| Program Memory Size        | -  |
| Program Memory Type        | External Program Memory  |
| EEPROM Size                | -  |
| RAM Size                   | 64K x 8  |
| Voltage - Supply (Vcc/Vdd) | 1.8V, 3.3V   |
| Data Converters            | A/D 6x10b  |
| Oscillator Type            | External   |
| Operating Temperature      | -40°C ~ 85°C (TA)  |
| Mounting Type              | Surface Mount  |
| Package / Case             | 256-LBGA, CSBGA  |
| Supplier Device Package    | 256-CSBGA (17x17)  |
| Purchase URL               | https://www.e-xfl.com/product-detail/analog-devices/za9l0022nw1lsga021 |

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EVALUATION KIT AVAILABLE

## **ABRIDGED DATA SHEET**

# Zatara High-Performance, Secure, 32-Bit ARM Microcontroller

## **General Description**

The Zatara® ZA9L0 is a highly integrated system-onchip (SoC) microcontroller based on the ARM922T™ 32-bit/16-bit core and tailored to the specific requirements of point-of-sale (POS) terminal design and meet the strict security requirements of the Payment Card Industry (PCI) Security Standards Council 2.0 specification. Running at 180MHz, the ZA9L0 is one of the fastest high-security microcontrollers available. The ZA9L0 provides a rich set of features on a single chip that reduces the manufacturing cost and time-to-market for secure transaction products such as POS terminals, vending machines, and security panels. The Zatara ZA9L0 includes the essential security features required of a POS terminal. It also provides seamless interfaces to LCD displays and keypads, and includes a wide array of peripherals such as an ADC, DMAs, UARTs, GPIOs, and timers that add flexibility to control and differentiate the system design.

System security is enhanced by a number of physical and logical protection mechanisms including environmental sensors (temperature, voltage, and frequency), true hardware random-number generator (RNG), realtime clock (RTC), and 4KB of secure nonvolatile SRAM storage with fast erase capability upon tampering. On power-up, application code is first cryptographically verified for authenticity to ensure that attackers cannot insert their own application code.

The ZA9L0 provides extensive communication support with three UARTs, two independent SPI<sup>™</sup> ports, and ample GPIO pins to implement any communication interface. The ZA9L0 also has a targeted set of peripherals to support PIN pad applications, including an LCD interface, multiple timers with PWM, watchdog, and a 6-channel, 10-bit ADC.

| <u></u> Applications |
|----------------------|
| Healthcare Reader    |
| Metering             |

Features

◆ 32-Bit ARM922T CPU Core 8KB/8KB I/D-Caches MMU Supporting Linux<sup>®</sup> and Windows<sup>®</sup> Embedded CE Operating Systems 180MHz Performance JTAG Embedded ICE Support
Zatara is a registered trademark of Maxim Integrated Products, Inc.

Alara is a registered trademark of Maxim Integrated Products, Inc. ARM922T is a trademark of ARM Limited. SPI is a trademark of Motorola, Inc. Linux is a registered trademark of Linus Torvalds. Windows is a registered trademark of Microsoft Corp.

## 

**EFTPOS** 

**PIN Pads** 

EPP

- ♦ 64KB Embedded Zero-Wait-State SRAM
- Vectored Interrupt Controller
- External Bus Interface

Dual External Bus Architecture (Primary and Secondary) 24-Bit Address, 16-Bit Data Synchronous Flash SDRAM in 16MB to 512MB Configurations

Power Management Unit

14MHz to 40MHz Oscillator and Phase-Locked Loop (PLL)-Generated System Clocks 32.768kHz Oscillator for RTC Clock Disable on a Peripheral-by-Peripheral Basis Three Modes: Active, Idle, and Battery Backup

- Real-Time Clock
- Watchdog Timer (WDT)
- Two Dedicated SPI Interfaces
- Nine Timer/Counters
- Three UARTs
  - 1 x 8-Wire Interface 2 x 4-Wire Interface
- ♦ POS Security Features for PCI Compliance Voltage and Temperature Sensors Sensors for Tamper Switches and Wire Mesh Clock Frequency and Glitch Protection Battery-Backed Secure Memory with Active Zeroization
- Embedded Boot ROM
- ♦ 32-Bit Unique ID Number
- NIST 800-22-Compliant Random-Number Generator
- ♦ FIPS 180-2-Compliant SHA-1 Hash Generator
- Display Controller Interface
- Up to 76 General-Purpose Input/Output (GPIO) Pins
- ♦ 10-Bit ADC, 6-Channel, 45ksps
- Eight Independent DMA Channels
- ♦ Voltage: Dual 1.8V and 3.3V Supplies
- ♦ 3.3V I/O Pins with 5V Tolerant I/O for UART and SPI
- ♦ 256-Pin BGA (1.0mm Ball Pitch) Package

### **Ordering Information**

| PART       | TEMP RANGE     | PIN-PACKAGE | JTAG |
|------------|----------------|-------------|------|
| ZA9L0xxxx+ | -40°C to +85°C | 256 LFBGA   | Yes  |

**Note:** The secure boot ROM in the device uses customerunique keys to verify the application image, so there is a unique part number per customer. Contact the factory for more information and to obtain samples for application development. +Denotes a lead(Pb)-free/RoHS-compliant package.

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For pricing, delivery, and ordering information, please contact Maxim Direct at 1-888-629-4642, or visit Maxim's website at www.maxim-ic.com.

# **ABRIDGED DATA SHEET**

## Zatara High-Performance, Secure, **32-Bit ARM Microcontroller**

#### **Functional Diagram**



Note to readers: This document is an abridged version of the full data sheet. To request the full data sheet, go to www.maxim-ic.com/ZA9L0 and click on Request Full Data Sheet.