Analog Devices Inc./Maxim Integrated - ZA9L004BNW1LSGA307 Datasheet

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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 "Embedded - Microcontrollers"

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/za9l004bnw1lsga307

Rev 0; 3/09

EVALUATION KIT AVAILABLE

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

ZA9L0

General Description

The Zatara® ZA9L0 is a highly integrated system-on-chip (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), real-time 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™ 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.

Applications

EFTPOS
PIN Pads
EPP
Healthcare Reader
Metering

Features

- **32-Bit ARM922T CPU Core**
  - 8KB/8KB I/D-Caches
  - MMU Supporting Linux® and Windows® Embedded CE Operating Systems
  - 180MHz Performance
  - JTAG Embedded ICE Support
- **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**

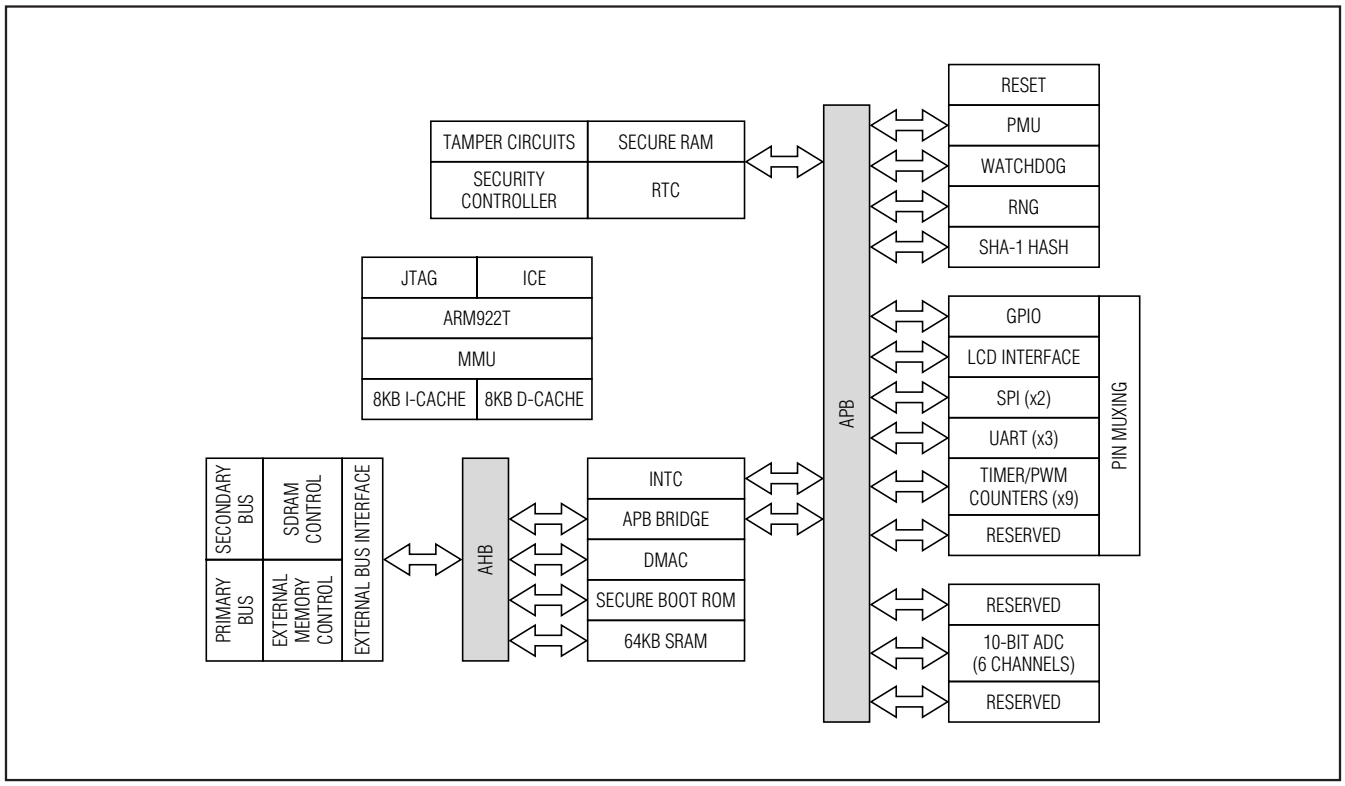
Ordering Information

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

Note: *The secure boot ROM in the device uses customer-unique 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.

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**.