



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

ZA9L1

General Description

The Zatara® ZA9L1 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 200MHz, the ZA9L1 is one of the fastest high-security microcontrollers available. The ZA9L1 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 ZA9L1 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 ZA9L1 provides extensive communication support with three UARTs, two independent SPI™ ports, a USB 2.0 On-The-Go (OTG) interface, and ample GPIO pins to implement any communication interface. The ZA9L1 also has a targeted set of peripherals to support PIN pad applications, including an LCD interface; multiple timers with PWM; a watchdog; a 4-channel, 10-bit ADC; two ISO 7816 smart card UARTs; and a 3-track magnetic stripe reader interface.

Applications

EFTPOS	Healthcare Reader
PIN Pads	Metering
EPP	

Features

- ◆ **32-Bit ARM922T CPU Core**
 - 8KB/8KB I/D-Caches
 - MMU Supporting Linux® and Windows®
 - Embedded CE Operating Systems
 - 200MHz Performance
 - JTAG Embedded ICE Support

Zatara 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.



- ◆ **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**
- ◆ **USB 2.0 OTG Interface**
- ◆ **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**
- ◆ **Two ISO 7816 Smart Card UARTs**
- ◆ **3-Track Magnetic Stripe Reader Interface**
- ◆ **Display Controller Interface**
- ◆ **Up to 76 General-Purpose Input/Output (GPIO) Pins**
- ◆ **10-Bit ADC, 4-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
ZA9L1xxxx+	-40°C to +85°C	256 LFBGA	Yes

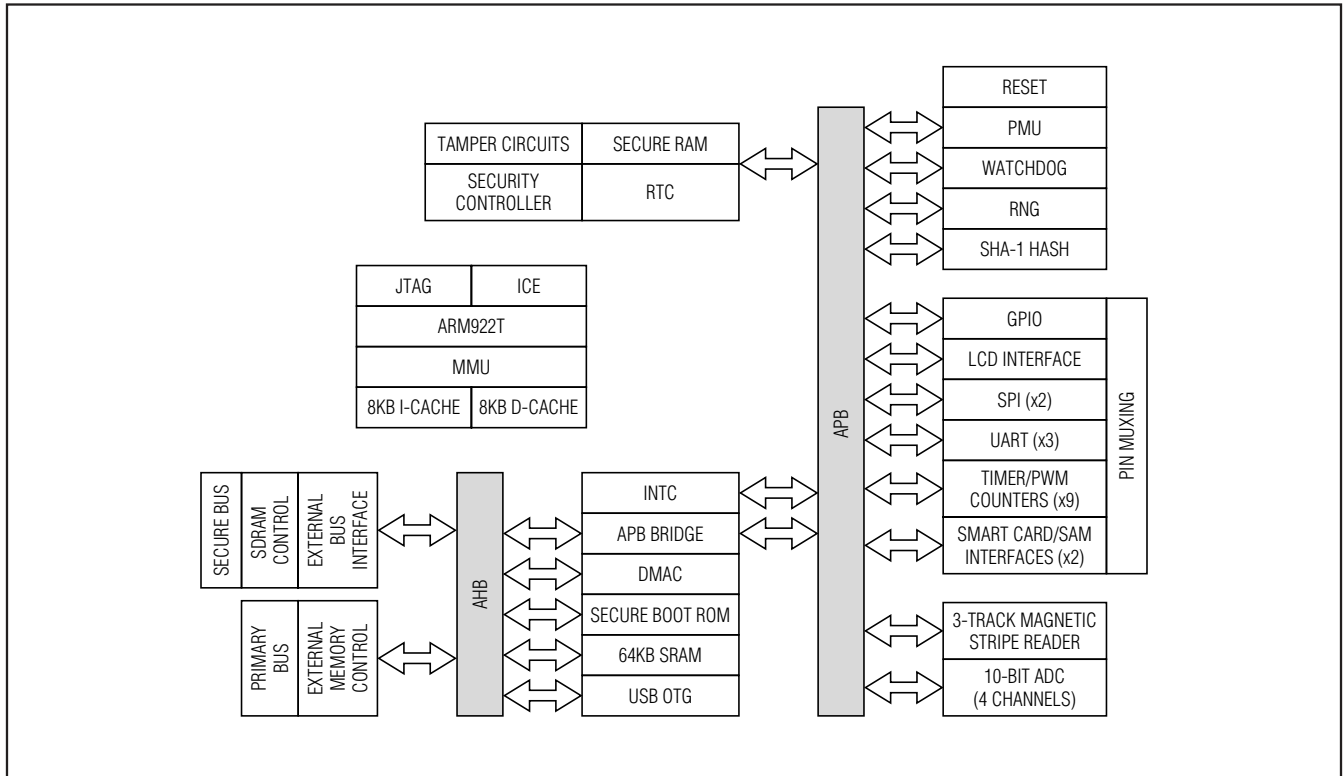
Note: The secure boot ROM in the device uses customer-unique keys to verify the application image, so there is a unique part number per customer. Contact the factory for more information and to obtain samples for application development.
+Denotes a lead(Pb)-free/RoHS-compliant package.

ABRIDGED DATA SHEET

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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/ZA9L1 and click on **Request Full Data Sheet**.