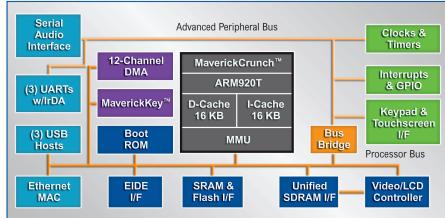# EP9312

Universal Platform ARM9™ System-on-Chip Processor
High-Performance ARM920T Design Ideal for Broad Range of Applications

EP9312

The EP9312 is a highly integrated system-on-chip processor that paves the way for a multitude of next-generation consumer and industrial electronic products. Designers of digital media servers and jukeboxes, telematic control systems, thin clients, set-top boxes, point-of sale terminals, industrial and building controls, biometric security systems, NAS, security,

DVR, VOIP, fitness equipment, home automation and GPS devices will benefit from the EP9312's integrated architecture and advanced features. In fact, with amazingly agile performance provided by a 200 MHz ARM920T processor, and featuring an incredibly wide breadth of peripheral interfaces, the EP9312 is well suited to an even broader range of

high volume applications. Furthermore, by enabling or disabling the EP9312's peripheral interfaces, designers can reduce development costs and accelerate time to market by creating a single platform that can be easily modified to deliver a variety of differentiated end products.

EP9312 FEATURES

- **200 MHz ARM920T Processor**
  - 16 KB data cache and 16 KB instruction cache
  - MMU enabling Linux® and Windows CE®
  - 100 MHz system bus
- **MaverickCrunch™ Math Engine**
  - Floating point, integer and signal processing instructions
  - Optimized for digital music compression algorithms
  - Hardware interlocks allow in-line coding
- **MaverickKey™ IDs for Digital Rights Management or Design IP Security**
  - 32-bit unique ID
  - 128-bit random ID

- **Integrated Peripheral Interfaces**
  - EIDE, up to 2 devices
  - 1/10/100 Mbps Ethernet MAC
  - Three-port USB 2.0 Full Speed host (OHCI)
  - Three UARTs (16550 Type)
  - IrDA interface, slow and fast mode
  - LCD interface with dedicated SDRAM channel
  - Touch screen interface
  - SPI™ port
  - AC '97 interface
  - I^2S interface, up to 6 channels
  - 8x8 keypad scanner
- **External Memory Options**
  - 32-bit SDRAM interface, up to four banks
  - 32/16/8-bit SRAM/Flash/ROM I/F
  - Serial EEPROM interface

- **Internal Peripherals**
  - Real-Time clock with software trim
  - 12 DMA channels for data transfer that maximizes system performance
  - Boot ROM
  - Dual PLLs control all clock domains
  - Watchdog timer
  - Two general purpose 16-bit timers
  - General purpose 32-bit timer
  - 40-bit debug timer
- **General-Purpose I/Os**
  - 16 enhanced GPIOs including interrupt capability
  - 49 additional optional GPIOs multiplexed on peripherals

OVERVIEW

High-Performance ARM920T Processor Core

The EP9312 features an advanced ARM920T processor design with an MMU that supports Linux®, Windows CE® and many other embedded operating systems. The ARM920T's 32-bit microcontroller architecture, with a five-stage pipeline, delivers impressive performance at very low power. The included 16 KB instruction cache and 16 KB data cache provide zero-cycle latency to the current program and data, or can be locked to provide guaranteed no-latency access to critical instructions and data. For applications with instruction memory size restrictions, the ARM920T's compressed Thumb® instruction set provides a space-efficient design that maximizes external instruction memory usage.

MaverickCrunch™ Math Engine for Ultra-Fast Math Processing

The MaverickCrunch engine is an advanced mixed-mode math coprocessor that greatly accelerates the single and double-precision integer and floating-point processing capabilities of the ARM920T processor core. The engine simplifies the end-user's programming task by using predefined coprocessor instructions, by utilizing standard ARM™ compiler tools, and by requiring just one debugger session for the entire system. Furthermore, the integrated design provides a single instruction stream and the advantage of zero latency for cached instructions. To emulate this capability, competitors' solutions add a DSP to the system, which requires separate compiler/linker/debugger tool sets. This additional DSP requires programmers to write two separate programs and debug them simultaneously, which can result in frustration and costly delays.

The single-cycle integer multiply-accumulate instruction in the MaverickCrunch engine allows the EP9312 to offer unique speed and performance while encoding digital audio and video formats, processing data via Ethernet, and performing other math-intensive computing and data-processing functions in consumer and industrial electronics.

MaverickKey™ Unique ID Secures Digital Content and OEM Designs

MaverickKey unique hardware programmed IDs provide an excellent solution to the growing concern over secure Web content and commerce. With Internet security playing an important role in the delivery of digital media such as books or music, traditional software methods are quickly becoming unreliable. The MaverickKey unique IDs provide OEMs with a method of utilizing specific hardware IDs for DRM (Digital Rights Management) mechanisms.

Both a specific 32-bit ID as well as a 128-bit random ID is programmed into the EP9312 through the use of laser probing technology. These IDs can then be used to match secure copyrighted content with the ID of the target device that the EP9312 is powering, and then deliver the copyrighted information over a secure connection. In addition, secure transactions can benefit by matching device IDs to server IDs.

MaverickKey IDs can also be used by OEMs and design houses to protect against design piracy by presetting ranges for unique IDs. For more information on securing your design using MaverickKey, please contact your Cirrus Logic sales representative.

Integrated Three-port USB 2.0 Full Speed Host with Transceivers

The EP9312 integrates three USB 2.0 Full Speed host ports. Fully compliant to the OHCI USB 2.0 Full Speed specification (12 Mbps), the host ports can be used to provide connections to a number of external devices including mass storage devices, external portable devices such as audio players or cameras, printers or USB hubs. Naturally, the three-port USB host also supports the USB 2.0 Low Speed standard. This provides the opportunity to create a wide array of flexible system configurations.

Integrated Ethernet MAC Reduces BOM Costs

The EP9312 integrates a 1/10/100 Mbps Ethernet Media Access Controller (MAC) on board. With a simple connection to an MII-based external PHY, an EP9312-based system has easy, high-performance, cost-effective Internet capability.

Support for a Wide Array of Display Interfaces with a Flexible Raster Controller

The EP9312 processor provides timing and interface signals for digital LCD, TFT, and CRT displays. It is fully programmable for either non-interlaced or dual-scan color and grayscale flat panel displays, with up to 18 bits-per-pixel of color resolution. System performance is enhanced with a separate dedicated data path to the SDRAM-based frame buffer, which supports resolutions up to 1024x768. A 16-bit PWM provides control for LCD panel contrast.

In addition, the EP9312 provides direct timing and interface signals for TV displays, with support for both NTSC and PAL formats through either RGB or YCrCb outputs.

Integrated Drive Electronics (IDE) Interface Reduces BOM Costs

With the EP9312's built-in IDE interface, the processor can connect directly with multiple hardware devices such as hard drives, CD drives and DVD drives. This saves designers money by minimizing their BOM costs, reduces their product size by shrinking board space and gets their products to market faster by saving design time. The IDE interface provides an industry standard connection to two AT Advanced Packet Interface (ATAPI) compliant devices. A single IDE port attaches to both master and slave devices. The interface supports three transfer modes corresponding to a range of transfer rates. These modes are Polled I/O, Multiword DMA and Ultra DMA.

High Quality Sound Delivered in Multiple Audio Configurations

The EP9312 delivers SPI, I²S and AC '97 serial interface support. The processor can be configured to provide up to six-channel I²S 24-bit audio. The AC '97 port supports multiple CODECs for cost-effective stereo audio output. Cirrus Logic provides high-performance audio decode and encode algorithms for a number of popular formats including MP3, WMA® and AAC™.

General-Purpose Memory Interface (SDRAM, SRAM, ROM, & FLASH)

The EP9312 features a unified memory address model in which all memory devices are accessed over a common address/data bus. A separate internal port is dedicated to the read-only Raster/Display refresh engine, while the rest of the memory accesses are performed via the high-speed processor bus. The SRAM memory controller supports 8, 16 and 32-bit devices and accommodates an internal boot ROM concurrently with a 32-bit SDRAM memory.

16-Bit Analog-to-Digital Converter (ADC) Provides an Integrated Touch-Screen Interface or General ADC Functionality

The EP9312 includes a 16-bit ADC, which can be utilized either as a touch-screen interface or for general ADC functionality. The touch-screen interface performs all sampling, averaging, ADC range checking, and control for a wide variety of analog-resistive touch screens. To improve system performance, the controller only interrupts the processor when a meaningful change occurs. The touch-screen hardware may be disabled, and the switch matrix and ADC controlled directly for general ADC usage if desired.

8x8 Keypad Interface Reduces BOM Costs

The keypad circuitry scans an 8x8 array of 64 normally open, single pole switches. Any one or two keys depressed will be de-bounced and decoded. An interrupt is generated whenever a stable set of depressed keys is detected. If the keypad is not utilized, the 16 column/row pins may be used as general-purpose I/Os.

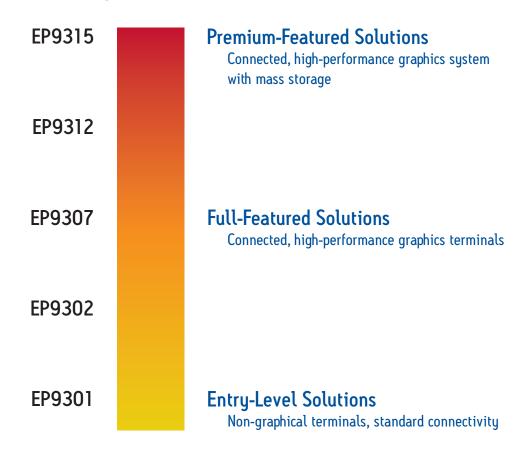## Multiple Booting Mechanisms Increase Flexibility

The processor includes a 16 KB boot ROM to set up standard configurations. Optionally, the processor may be booted from FLASH memory, over the SPI serial interface or through the UART. This boot flexibility makes it easy to design user-controlled, field-upgradable systems.

Abundant General Purpose I/Os Build Flexible Systems

The EP9312 includes both enhanced and standard general- purpose I/O pins (GPIOs). The 16 different enhanced GPIOs may individually be configured as inputs, outputs or interrupt-enabled inputs. There are an additional 49 standard GPIOs that may individually be used as inputs, outputs or open-drain pins. The standard GPIOs are multiplexed with peripheral function pins, so the number available depends on the utilization of peripherals. Together, the enhanced and standard GPIOs facilitate easy system design with external peripherals not integrated on the EP9312.

EP9312

The Cirrus Logic ARM9™ Embedded Processor Family

EP9315

Premium-Featured Solutions
Connected, high-performance graphics system
with mass storage

EP9312

EP9307

Full-Featured Solutions
Connected, high-performance graphics terminals

EP9302

EP9301

Entry-Level Solutions
Non-graphical terminals, standard connectivity

Plays Windows® Media™

ARM POWERED®

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Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.

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