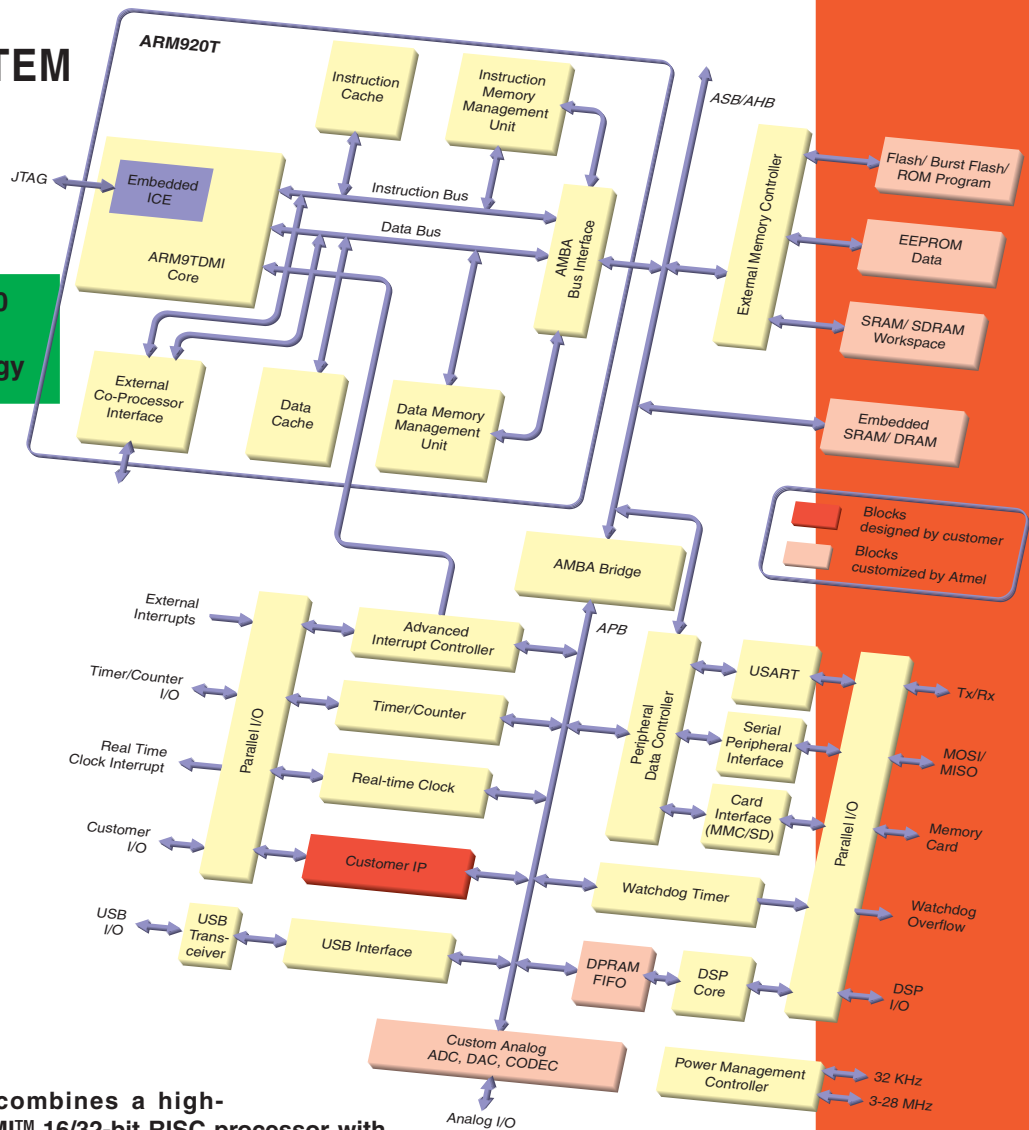


# ARM920T™ MICROCONTROLLER

## CORE SYSTEM

Up to 200 MIPS at 180 MHz on 0.18-micron 1.8V CMOS technology



The ARM920T core combines a high-performance ARM9TDMI™ 16/32-bit RISC processor with instruction and data cache memories and memory management units (MMU). It forms the basis of a system-on-chip targeted at multi-tasking applications requiring high performance, sophisticated memory management and low power consumption. These include smart phones, PDAs, in-car multimedia systems and MP3 players.

- Harvard cache architecture minimizes memory access bottlenecks:
  - separate embedded instruction and data cache memories
- 5-stage instruction pipelining for maximum instruction and data throughput
- ARM's industry-leading 16-bit Thumb code for maximum code density
- Binary code compatible with ARM7TDMI™ for migration of existing application software
- Advanced Memory Management Units (MMU) for virtual memory management and protection
- System bus interface including AMBA High-speed Bus (AHB) Wrapper
- Embedded In-circuit Emulator (ICE) and JTAG interface for ease of debug
- Wide range of qualified, bus-compatible memories and peripherals enables an application-specific system-on-chip to be created rapidly and with low risk
- Comprehensive software development tools – C and C++ compilers, debuggers and emulators for parallel hardware/software development



**Corporate Headquarters**

2325 Orchard Parkway  
San Jose, CA 95131  
USA  
Tel: (+1) (408) 441-0311  
Fax: (+1) (408) 436 4200

**Europe**

Atmel Sarl  
Route des Arsenaux 41  
Casa Postale 80  
CH-1705 Fribourg  
Switzerland  
Tel: (+41) 26-426-5555  
Fax: (+41) 26-426-5500

**Asia**

Atmel Asia Ltd  
Room 1219  
Chinachem Golden Plaza  
77 Mody Road  
Tsimshatsui East, Kowloon  
Hong Kong  
Tel: (+852) 272 19 778  
Fax: (+852) 272 21 369

**Japan**

Atmel Japan KK  
Tonetsu Shinkawa Bldg, 9F  
1-24-8 Shinkawa  
Chuo-Ku, Tokyo 104-0033  
Japan  
Tel: (+81) 3 3523 3551  
Fax: (+81) 3 3523 7581

**E-mail**

literature@atmel.com

**Web Site**

<http://www.atmel.com>



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The ARM920T core is the centrepiece of a high-performance, low-power system-on-chip. Atmel's wide range of bus-compatible memory blocks and peripherals allows the advanced features of the ARM9TDMI to be exploited to the maximum. Design time and risk is reduced by using system building blocks qualified during Atmel's numerous ARM7TDMI™-based projects.

**Burst Flash or DataFlash Memory**

Atmel's leadership in Flash memory technology allows us to provide the highest-specification memory blocks in the industry for system-level integration. Burst Flash takes full advantage of the cache-based memory management system of the ARM920T.

**RAM Workspace**

On-chip SRAM or Pseudo-DRAM eliminates the bottleneck imposed by frequent accesses to off-chip memory. If additional off-chip SRAM or SDRAM is required, the External Memory Controller provides access with minimal delay.

**MP3 Enabled**

The ARM920T gives the performance needed for MP3 decoding. Atmel can provide a complete MP3 solution including software, qualified audio DAC and memory card interface using one of the industry-standard protocols (Multi-media Card (MMC) or Secure Digital (SD)).

**On-chip DSP Core with DPRAM FIFO Postbox**

Many current applications, notably information appliances, require one or more DSP cores. Atmel offers the choice between the industry-leading TeakDSPCore® and PalmDSPCore®.

**Advanced Interrupt Controller (AIC)**

The AIC improves the real-time performance of the ARM9TDMI core by reducing the time taken to reach an interrupt handler to a single instruction cycle. The AIC can handle up to 32 prioritized interrupt sources.

**Right-first-time Silicon**

Atmel's wide experience in ARM-based systems, rich library of qualified, plug-compatible IP blocks and advanced design flow are aimed at producing a right-first-time system or silicon with minimal risk and in the shortest possible design cycle time.

**Serial Communication Interfaces**

The fully programmable two-channel **USART** can be configured for any application scenario. The **SPI** provides serial communication with a wide range of external devices in master or slave mode. The **USB Interface** gives immediate connectivity to PC-based systems.

**Peripheral Data Controller (Peripheral DMA)**

System performance is considerably enhanced by using the PDC to transfer data directly between peripherals and memory, bypassing the processor.

**Wide Choice of Advanced Peripherals**

These include a Timer/Counter, two-century Real-time Clock (RTC), Watchdog Timer and Parallel I/O Controller (PIO).

**Analog**

Atmel can apply its leadership in analog cell design to one of its many qualified analog blocks (ADC, DAC, CODEC, PLL, Oscillator). Alternatively we can develop a new analog cell if required.

**Power Management Controller**

A power management controller block keeps system power consumption to a minimum under all conditions of operation. It provides slow, idle and sleep modes, enabling individual peripherals to be turned off when not required.

**Customer IP**

Atmel's customers are innovators in their field of application, and many have developed proprietary IP blocks embodying this expertise. Atmel has already incorporated a number of such blocks into market-leading products. We can do the same for you.

