AT91 SERIES

ARM THUMB - BASED

MICROCONTROLLERS

AT91 microcontrollers, the BEST combination of low-power consumption, 32-bit performance and 16-bit system cost

The AT91F40416, the first ARM7TDMI-plus-Flash Standard Product

- System-level integration on a standard product:
  - ARM7TDMI™ RISC processor core
  - Optimal combination of large SRAM, ROM and Flash memories
  - Wide choice of on-chip peripherals
  - Low risk, low cost, rapid time-to-market
- High performance for compute-intensive applications:
  - On-chip 32-bit architecture
  - 3-stage instruction execution pipeline for high instruction throughput
  - Single-cycle memory access through EBI
  - Hardware multiplier plus barrel shifter gives DSP capability
  - PDC channels (on-chip DMA) free the processor for the application

- Low power for hand-held applications:
  - ARM7TDMI processor is industry leader in MIPS/Watt
  - Advanced power management provides idle mode and disables unused peripherals
- Optimized for real-time applications:
  - Low-latency Advanced Interrupt Controller
  - Banked registers provide separate stacks and call/returns in interrupt modes
  - Wide choice of Real-time Operating Systems for ease of development of real-time applications
- Extensive application development tools for rapid, low-risk software development
- Widely used in embedded GPS systems, hand-held communications devices, wireless networking, industrial automation

AMEL®

AT91 ARM THUMB MICROCONTROLLERS

The AT91 series provides the optimal combination of processing power, peripherals and memory blocks for demanding real-time applications that require high performance on a tight power budget. Its wide range of Real-time Operating Systems and sophisticated application development tools minimize the risk and time taken to bring new applications to the market. As a standard product, it eliminates the cost and risks of custom IC development. However, its modular design means that application-specific variants can be rapidly developed.

AT91 Architecture

The AT91 series is built around the industry-leading ARM7TDMI 32-bit RISC processor core. Variants in the product range provide the optimal combination of memory – SRAM, ROM or Flash – for each application. The External Bus Interface provides a rapid, flexible means of connecting additional memory and application-specific peripheral devices.

Two key features significantly enhance the AT91's real-time performance. The Advanced Interrupt Controller substantially reduces the processor overhead in handling internal and external interrupts. The multiple Peripheral Data Controller channels allow blocks of data to be transferred directly between memory and serial peripherals without processor intervention.

The peripherals are configurable, and easily programmable. They include a full duplex USART, an SPI operating in master or slave mode, and a Timer/Counter providing frequency measurement, event counting, interval measurement, PWM, etc.

The Advanced Power Management system ensures that power consumption is kept to a minimum under all conditions of operation. The processor can be put in idle mode, and individual peripherals can be disabled if they are not used. The fully static design means that the clock can be run extremely slowly, down to zero Hertz if necessary, to reduce power consumption to an absolute minimum.

AT91 Development Tools

Atmel's AT91 series microcontrollers are fully supported by state-of-the art development tools including C-compilers, Assemblers, Real Time Operating Systems and software debug tools. These are provided by a wide range of accredited third-party suppliers. The low-cost evaluation kits, the AT91EB01 and AT91EB63, are convenient entry points for application developers.

Part Number	Flash Bytes	ROM Bytes	SRAM Bytes	Hardware Multiplier	I/O Pins	Multi-processor I/F	16-bit Timers	SPI	USART	PDC Channels	Vcc (V)	Speed (MHz)	Package
AT91M40400	-	-	4K	1	81	-	3	-	2	4	2.7-3.6	33	TQFP100
AT91M40400	-	-	4K	1	81	-	3	-	2	4	1.8-3.6	12	TQFP100
AT91F40416	2M	-	4K	1	85	-	3	-	2	4	2.7-3.6	25	BGA120
AT91M63200	-	-	2K+1K	1	144	1	6	1	3	8	2.7-3.6	25	TQFP176
AT91M63200	-	-	2K+1K	1	144	1	6	1	3	8	1.8-3.6	12	TQFP176
AT91M43300	-	-	3K	1	115	-	6	1	3	8	2.7-3.6	25	BGA144
AT91M43300	-	-	3K	1	115	-	6	1	3	8	1.8-3.6	12	BGA144
AT91M40100	-	-	1K	1	81	-	3	-	2	4	2.7-3.6	33	TQFP100
AT91M40800	-	-	8K	1	81	-	3	-	2	4	2.7-3.6	40	TQFP100
AT91M40800	-	-	8K	1	81	-	3	-	2	4	1.8-3.6	17	TQFP100
AT91R40807	-	-	8K+128K	1	81	-	3	-	2	4	2.7-3.6	33	TQFP100
AT91M40403	-	32K	4K	1	81	-	3	-	2	4	2.7-3.6	33	TQFP100
AT91M40807	-	128K	8K	1	81	-	3	-	2	4	2.7-3.6	33	TQFP100

AT91 Product Overview