



## PRODUCT GUIDE

September 2001

### AT90 Series AVR® Flash Microcontrollers

| Part Number | Processor | Description   | Availability |
|-------------|-----------|---|--------------|
| AT90S1200   | AVR       | AVR RISC, In-System Programmable Microcontroller with 1K Byte Flash and 64 Bytes EEPROM, 20-pin PDIP, 20-lead SOIC and 20-lead SSOP Packages  | Now          |
| AT90S2313   | AVR       | AVR RISC, In-System Programmable Microcontroller with 2K Bytes Flash, 128 Bytes SRAM, 128 Bytes EEPROM, UART, 20-pin PDIP and 20-lead SOIC Packages   | Now          |
| AT90S2323   | AVR       | AVR RISC, In-System Programmable Microcontroller with 2K Bytes Flash, 128 Bytes SRAM, 128 Bytes EEPROM, 8-pin PDIP and 8-lead SOIC Packages   | Now          |
| AT90LS2323  | AVR       | 2.7-volt, AVR RISC, In-System Programmable Microcontroller with 2K Bytes Flash, 128 Bytes SRAM, 128 Bytes EEPROM, 8-pin PDIP and 8-lead SOIC Packages   | Now          |
| AT90S2343   | AVR       | AVR RISC, In-System Programmable Microcontroller with 2K Bytes Flash, 128 Bytes SRAM, 128 Bytes EEPROM, 8-pin PDIP and 8-lead SOIC Packages   | Now          |
| AT90LS2343  | AVR       | 2.7-volt, AVR RISC, In-System Programmable Microcontroller with 2K Bytes Flash, 128 Bytes SRAM, 128 Bytes EEPROM, 8-pin PDIP and 8-lead SOIC Packages   | Now          |
| AT90S4433   | AVR       | AVR RISC, In-System Programmable Microcontroller with 4K Bytes Flash, 128 Bytes SRAM, 256 Bytes EEPROM, UART, 6-channel 10-bit ADC, 28-pin PDIP and 32-lead TQFP Packages                         | Now          |
| AT90LS4433  | AVR       | 2.7-volt, AVR RISC, In-System Programmable Microcontroller with 4K Bytes Flash, 128 Bytes SRAM, 256 Bytes EEPROM, UART, 6-channel 10-bit ADC, 28-pin PDIP and 32-lead TQFP Packages               | Now          |
| AT90S8515   | AVR       | AVR RISC, In-System Programmable Microcontroller with 8K Bytes Flash, 512 Bytes SRAM, 512 Bytes EEPROM, UART, 40-pin PDIP, 44-lead PLCC and 44-lead TQFP Packages                                 | Now          |
| AT90S8535   | AVR       | AVR RISC, In-System Programmable Microcontroller with 8K Bytes Flash, 512 Bytes SRAM, 512 Bytes EEPROM, UART, 8-channel 10-bit ADC, 40-pin PDIP, 44-lead PLCC and 44-lead TQFP Packages           | Now          |
| AT90LS8535  | AVR       | 2.7-volt, AVR RISC, In-System Programmable Microcontroller with 8K Bytes Flash, 512 Bytes SRAM, 512 Bytes EEPROM, UART, 8-channel 10-bit ADC, 40-pin PDIP, 44-lead PLCC and 44-lead TQFP Packages | Now          |
| AT90C8534   | AVR       | 1.8-volt, AVR RISC Microcontroller with 8K Bytes Flash, 512 Bytes EEPROM, 256 Bytes SRAM with 6-channel 10-bit A/D and 48-lead VQFP Package   | Now          |

### ATtiny Series AVR Flash Microcontroller

| Part Number | Processor | Description   | Availability |
|-------------|-----------|---|--------------|
| ATtiny11    | AVR       | AVR RISC Microcontroller with 1K Byte Flash Memory, 8-pin PDIP and 8-lead SOIC Packages   | Now          |
| ATtiny11L   | AVR       | 2.7-volt, AVR RISC Microcontroller with 1K Byte Flash Memory, 8-pin PDIP and 8-lead SOIC Packages   | Now          |
| ATtiny12    | AVR       | AVR RISC Microcontroller with 1K Byte In-System Programmable Flash Memory, 64 Bytes EEPROM, 8-pin PDIP and 8-lead SOIC Packages                                 | Now          |
| ATtiny12L   | AVR       | 2.7-volt, AVR RISC Microcontroller with 1K Byte In-System Programmable Flash Memory, 64 Bytes EEPROM, 8-pin PDIP and 8-lead SOIC Packages                       | Now          |
| ATtiny12V   | AVR       | 1.8-volt, AVR RISC Microcontroller with 1K Byte In-System Programmable Flash Memory, 64 Bytes EEPROM, 8-pin PDIP and 8-lead SOIC Packages                       | Now          |
| ATtiny15L   | AVR       | 2.7-volt, AVR RISC Microcontroller with 1K Byte In-System Programmable Flash Memory, 64 Bytes EEPROM, 4-channel 10-bit ADC, 8-pin PDIP and 8-lead SOIC Packages | Now          |
| ATtiny28V   | AVR       | 1.8-volt, AVR RISC Microcontroller with 2K Bytes Flash Memory, 28-pin PDIP and 32-lead TQFP and 32-pad MLF Packages   | Now          |
| ATtiny28L   | AVR       | 2.7-volt, AVR RISC Microcontroller with 2K Bytes Flash Memory, 28-pin PDIP and 32-lead TQFP and 32-pad MLF Packages   | Now          |

## ATmega Series AVR Flash Microcontrollers

| Part Number | Processor | Description  | Availability |
|-------------|-----------|--|--------------|
| ATmega8     | AVR       | AVR RISC Microcontroller with 8K Bytes In-System and Self-Programmable Flash Memory, 512 Bytes EEPROM, 1K Byte SRAM, USART, TWI, SPI, 8-channel 10-bit ADC, Hardware Multiplier, 28-pin PDIP, 32-pad MLF and 32-lead VQFP Packages   | 4Q2001       |
| ATmega8L    | AVR       | 2.7-volt, AVR RISC Microcontroller with 8K Bytes In-System and Self-Programmable Flash Memory, 512 Bytes EEPROM, 1K Byte SRAM, USART, TWI, SPI, 8-channel 10-bit ADC, Hardware Multiplier, 28-pin PDIP, 32-pad MLF and 32-lead VQFP Packages   | 4Q2001       |
| ATmega16    | AVR       | AVR RISC Microcontroller with 16K Bytes In-System and Self-Programmable Flash Memory, 1K Byte EEPROM, 1K Byte SRAM, USART, TWI, SPI, 8-channel 10-bit ADC, Hardware Multiplier, JTAG Interface for Boundary Scan and On-chip Debug, 40-pin PDIP, 44-pad MLF and 44-lead TQFP Packages            | 1Q2002       |
| ATmega16L   | AVR       | 2.7-volt, AVR RISC Microcontroller with 16K Bytes In-System and Self-Programmable Flash Memory, 1K Byte EEPROM, 1K Byte SRAM, USART, TWI, SPI, 8-channel 10-bit ADC, Hardware Multiplier, JTAG Interface for Boundary Scan and On-chip Debug, 40-pin PDIP, 44-pad MLF and 44-lead TQFP Packages  | 1Q2002       |
| ATmega32    | AVR       | AVR RISC Microcontroller with 32K Bytes In-System and Self-Programmable Flash Memory, 1K Byte EEPROM, 2K Bytes SRAM, USART, TWI, SPI, 8-channel 10-bit ADC, Hardware Multiplier, JTAG Interface for Boundary Scan and On-chip Debug, 40-pin PDIP, 44-pad MLF and 44-lead TQFP Packages           | 2Q2002       |
| ATmega32L   | AVR       | 2.7-volt, AVR RISC Microcontroller with 32K Bytes In-System and Self-Programmable Flash Memory, 1K Byte EEPROM, 2K Bytes SRAM, USART, TWI, SPI, 8-channel 10-bit ADC, Hardware Multiplier, JTAG Interface for Boundary Scan and On-chip Debug, 40-pin PDIP, 44-pad MLF and 44-lead TQFP Packages | 2Q2002       |
| ATmega64    | AVR       | AVR RISC Microcontroller with 64K Bytes In-System and Self-Programmable Flash Memory, 2K Bytes EEPROM, 4K Bytes SRAM, 2 USARTs, TWI, SPI, 8-channel 10-bit ADC, Hardware Multiplier, JTAG Interface for Boundary Scan and On-chip Debug, 64-lead TQFP Package                                    | 2Q2002       |
| ATmega64L   | AVR       | 2.7-volt, AVR RISC Microcontroller with 64K Bytes In-System and Self-Programmable Flash Memory, 2K Bytes EEPROM, 4K Bytes SRAM, 2 USARTs, TWI, SPI, 8-channel 10-bit ADC, Hardware Multiplier, JTAG Interface for Boundary Scan and On-chip Debug, 64-lead TQFP Package                          | 2Q2002       |
| ATmega103   | AVR       | AVR RISC, In-System Programmable Microcontroller with 128K Bytes Flash, 4K Bytes SRAM, 2K Bytes EEPROM, UART, RTC, 8-channel 10-bit ADC, 64-lead TQFP Package  | Now          |
| ATmega103L  | AVR       | Low-voltage, AVR RISC, In-System Programmable Microcontroller with 128K Bytes Flash, 4K Bytes SRAM, 2K Bytes EEPROM, UART, RTC, 8-channel 10-bit ADC, 64-lead TQFP Package   | Now          |
| ATmega128   | AVR       | AVR RISC Microcontroller with 128K Bytes In-System and Self-Programmable Flash Memory, 4K Bytes EEPROM, 4K Bytes SRAM, 2 USARTs, TWI, SPI, 8-channel 10-bit ADC, Hardware Multiplier, JTAG Interface for Boundary Scan and On-chip Debug, 64-lead TQFP Package                                   | 4Q2001       |
| ATmega128L  | AVR       | 2.7-volt, AVR RISC Microcontroller with 128K Bytes In-System and Self-Programmable Flash Memory, 4K Bytes EEPROM, 4K Bytes SRAM, 2 USARTs, TWI, SPI, 8-channel 10-bit ADC, Hardware Multiplier, JTAG Interface for Boundary Scan and On-chip Debug, 64-lead TQFP Package                         | 4Q2001       |
| ATmega161   | AVR       | AVR RISC Microcontroller with 16K Bytes In-System and Self-Programmable Flash Memory, 512 Bytes EEPROM, 1K Byte SRAM, Dual-USART, Hardware Multiplier, 40-pin PDIP and 44-lead TQFP Packages   | Now          |
| ATmega161L  | AVR       | 2.7-volt, AVR RISC Microcontroller with 16K Bytes In-System and Self-Programmable Flash Memory, 512 Bytes EEPROM, 1K Byte SRAM, Dual-USART, Hardware Multiplier, 40-pin PDIP and 44-lead TQFP Packages   | Now          |
| ATmega163   | AVR       | AVR RISC Microcontroller with 16K Bytes In-System and Self-Programmable Flash Memory, 1K Byte EEPROM, 1K Byte SRAM, UART, 8-channel 10-bit ADC, Hardware Multiplier, 40-pin PDIP and 44-lead TQFP Packages   | Now          |
| ATmega163L  | AVR       | 2.7-volt, AVR RISC Microcontroller with 16K Bytes In-System and Self-Programmable Flash Memory, 1K Byte EEPROM, 1K Byte SRAM, UART, 8-channel 10-bit ADC, Hardware Multiplier, 40-pin PDIP and 44-lead TQFP Packages   | Now          |
| ATmega323   | AVR       | AVR RISC Microcontroller with 32K Bytes In-System and Self-Programmable Flash Memory, 1K Byte EEPROM, 2K Bytes SRAM, USART, TWI, SPI, 8-channel 10-bit ADC, Hardware Multiplier, JTAG Interface for Boundary Scan and On-chip Debug, 40-pin PDIP and 44-lead TQFP Packages                       | Now          |
| ATmega323L  | AVR       | 2.7-volt, AVR RISC Microcontroller with 32K Bytes In-System and Self-Programmable Flash Memory, 1K Byte EEPROM, 2K Bytes SRAM, USART, TWI, SPI, 8-channel 10-bit ADC, Hardware Multiplier, JTAG Interface for Boundary Scan and On-chip Debug, 40-pin PDIP and 44-lead TQFP Packages             | Now          |

### ATmega Series AVR Development Tools

| Part Number | Description   | Availability |
|-------------|---|--------------|
| ATICE10     | In-circuit Emulator for tinyAVR Family and AVR Family   | Now          |
| ATICE30     | In-circuit Emulator System for megaAVR™ Family  | Now          |
| ATICE200    | Low-cost In-circuit Emulator, Supports Most Devices in 1 - 8K Range   | Now          |
| ATASICICE   | In-circuit Emulation System for Embedded AVR Core Development   | Now          |
| AT90ADCPD   | AT90ICEPRO Analog Replacement Kit   | Now          |
| ATmegaPOD   | ATmegaICE Pod Replacement Kit   | Now          |
| ATmeg163POD | ATmegaICE Pod Replacement Kit   | Now          |
| ATICE10UPGR | ICEPRO to ICE10 Upgrade Kit   | Now          |
| ATAVRISP    | Low-cost In-System Programmer for all In-System Programmable AVR Devices                                      | Now          |
| ATJTAGICE   | In-circuit Emulator for megaAVR Devices with JTAG Port  | Now          |
| ATSTK500    | Starter Kit and Evaluation Board for all AVR Devices  | Now          |
| ATSTK501    | Starter Kit Expansion Board for 64-pin TQFP Devices   | Now          |
| AT90EIT1    | Embedded Internet Toolkit – Reference Design Showing How to Connect an AVR Device to Internet                 | Now          |
| AT90BCKIT   | Battery Charger Starter Kit – Reference Design Showing How to Use the AVR Devices to Control Battery Charging | Now          |

### AT43/AT76 Series AVR USB Microcontrollers and USB Hubs

| Part Number                     | Description   | Availability |
|---------------------------------|---|--------------|
| AT43301                         | Low-cost USB Hub Controller, 24-lead SOIC or 32-lead LQFP                           | Now          |
| AT43312A                        | Full Function USB Hub Controller, 32-pin PDIP, 32-lead SOIC or 32-lead LQFP         | Now          |
| AT43USB320A                     | AVR Microcontroller with USB Hub and Embedded Function Controller, 100-lead LQFP    | Now          |
| AT43USB324                      | USB Keyboard Controller with Embedded 2 Port Hub, 48-lead LQFP or 48-pin PDIP       | Now          |
| AT43USB325E                     | USB Keyboard Controller with Embedded 4 Port Hub, 64-lead LQFP                      | Now          |
| AT43USB355E                     | USB Microcontroller with ADC, PWM, Embedded 2 Port Hub and 24K Bytes of Program RAM | Now          |
| AT43USB355M                     | USB Microcontroller with ADC, PWM, Embedded 2 Port Hub and 24K Bytes of ROM         | 1Q2002       |
| AT76C711-OT64/<br>AT76C711-OZ64 | AVR-based Bridge between Full-speed USB and Fast Serial Asynchronous Interfaces     | Now          |

### AT43 Series AVR USB and USB Hubs Evaluation and Development Kits

| Part Number | Description                                 | Availability |
|-------------|---|--------------|
| AT43DK301   | Evaluation Kit for AT43301                  | Now          |
| AT43DK312A  | Evaluation Kit for AT43312A                 | Now          |
| AT43DK320A  | Development Kit for AT43USB320A/AT43USB321  | Now          |
| AT43DK355   | Development Kit for AT43USB355E/AT43USB355M | Now          |
| AT43DK324   | Development Kit for AT43USB324              | Now          |

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### AT94K Series AVR Field Programmable System-Level Integration Circuits (FPSLIC™) – AVR, FPGA and SRAM on a Single Chip

| Part Number               | FPGA Gates | FreeRAM™    | FPGA I/O <sup>(1)</sup> | Program/Data SRAM                  | Availability |
|---------------------------|------------|-------------|-------------------------|------------------------------------|--------------|
| AT94K05AL<br>Micro FPSLIC | 5K         | 2,048 Bits  | Up to 96                | 4K - 16K Bytes/<br>4K - 16K Bytes  | Now          |
| AT94K10AL                 | 10K        | 4,096 Bits  | Up to 192               | 20K - 32K Bytes/<br>4K - 16K Bytes | Now          |
| AT94K40AL                 | 40K        | 18,432 Bits | Up to 384               | 20K - 32K Bytes/<br>4K - 16K Bytes | Now          |

Note: 1. There are up to 16 AVR programmable I/Os on each device, plus several dedicated AVR I/Os.

### AT94S Series AVR Secure FPSLIC

| Part Number                | FPGA Gates | FreeRAM™    | FPGA I/O  | Program/Data SRAM                  | Availability |
|----------------------------|------------|-------------|-----------|------------------------------------|--------------|
| AT94SK05AL<br>Micro FPSLIC | 5K         | 2,048 Bits  | Up to 96  | 4K - 16K Bytes/<br>4K - 16K Bytes  | 1Q2002       |
| AT94S10AL                  | 10K        | 4,096 Bits  | Up to 192 | 20K - 32K Bytes/<br>4K - 16K Bytes | 1Q2002       |
| AT94S40AL                  | 40K        | 18,432 Bits | Up to 384 | 20K - 32K Bytes/<br>4K - 16K Bytes | 1Q2002       |

### AT94 Series AVR FPSLIC Hardware and Software Tools

| Part Number               | Description   | Availability |
|---------------------------|---|--------------|
| <b>Software</b>           |   |              |
| ATDS94KSW1                | AT94K Series Design System Annual Subscription Fee  | Now          |
| ATDS94KSW2                | AT94K Series Design System Perpetual License  | Now          |
| ATDM94KSW2                | AT94K Series Design System Annual Maintenance   | Now          |
| <b>Hardware</b>           |   |              |
| ATSTK94                   | FPSLIC Starter Kit, Cable, Software (4-month Software Trial – No Discounts)                     | Now          |
| ATDH94STKB                | FPSLIC Starter Kit Board, Cable (Hardware Only – No Software)                                   | Now          |
| ATDH2225                  | ISP Download Cable (For Configurator, Included in FPSLIC Starter Kit)                           | Now          |
| ATDH94DNG                 | Hardware Dongle (If no Network Card to Key License Off)   | Now          |
| <b>Training</b>           |   |              |
| AT94TRAIN                 | FPSLIC Training Course, Including Starter Kit   | Now          |
| <b>University Program</b> |   |              |
| AT94STK94U                | FPSLIC University Laboratory Kit (12-month License)   | Now          |
| ATDS94KSWU                | AT94K Series University Annual Subscription Fee   | Now          |
| ATDH94STKB                | FPSLIC University Laboratory Board, Cable (Hardware Only – No Software)                         | Now          |
| AT94KINST                 | FPSLIC University Instructor Package (Includes Laboratory Kit, Documentation and Presentations) | Now          |

**AT91 Series ARM®-based Microcontrollers**

| Part Number | Processor | Description   | Availability |
|-------------|-----------|---|--------------|
| AT91M40800  | ARM7TDMI® | 40 MHz, 8K Bytes SRAM, 3 Timers, 2 USARTs, Watchdog, 4-channel PDC, 100-lead TQFP Package   | Now          |
| AT91F40816  | ARM7TDMI  | 40 MHz, 8K Bytes SRAM, 2M Bytes Flash, 3 Timers, 2 USARTs, Watchdog, 4-channel PDC, 120-ball BGA Package  | Now          |
| AT91R40807  | ARM7TDMI  | 40 MHz, 136K Bytes SRAM, 3 Timers, 2 USARTs, Watchdog, 4-channel PDC, 100-lead TQFP Package   | Now          |
| AT91FR4081  | ARM7TDMI  | 40 MHz, 136K Bytes SRAM, 1M Byte Flash, 3 Timers, 2 USARTs, Watchdog, 4-channel PDC, 120-ball BGA Package   | Now          |
| AT91R40008  | ARM7TDMI  | 66 MHz, 256K Bytes SRAM, 3 Timers, 2 USARTs, Watchdog, 4-channel PDC, 100-lead TQFP Package   | Now          |
| AT91M40807  | ARM7TDMI  | 40 MHz, 8K Bytes SRAM, 128K Bytes Mask ROM, 3 Timers, 2 USARTs, Watchdog, 4-channel PDC, 100-lead TQFP Package  | Now          |
| AT91M43300  | ARM7TDMI  | 25 MHz, 3K Bytes SRAM, 6 Timers, 3 USARTs, MPI, SPI, Watchdog, 8-channel PDC, 144-lead TQFP Package   | Now          |
| AT91M63200  | ARM7TDMI  | 25 MHz, 2K Bytes SRAM, MPI, Including 1K Byte DPRAM, 6 Timers, 3 USARTs, SPI, Watchdog, 8-channel PDC, 176-lead TQFP Package  | Now          |
| AT91M42800A | ARM7TDMI  | 33 MHz, 8K Bytes SRAM, 6 Timers, 2 USARTs, 2 SPIs, Watchdog, 8-channel PDC, 32 kHz Oscillator + PLL, 144-lead TQFP or 144-ball BGA Package  | Now          |
| AT91M55800A | ARM7TDMI  | 33 MHz, 8K Bytes SRAM, Clock Deactivation, Slow, Standby and Power-down Modes, On-chip Oscillator + PLL, 6 Timers, RTC, 3 USARTs, 1 SPI, Watchdog, 8-channel 10-bit ADC, 2-channel 10-bit DAC, 8-channel PDC, 176-lead TQFP or 176-ball BGA Package | Now          |

**AT91 Series ARM Evaluation Kits**

| Part Number          | Supported Devices                     | Availability |
|----------------------|---------------------------------------|--------------|
| AT91EB40             | AT91M40800, AT91R40807 and AT91M40807 | Now          |
| AT91EB40 + AT91MEC01 | AT91F40816, AT91FR4081                | Now          |
| AT91EB63             | AT91M63200, AT91M43300                | Now          |
| AT91EB42             | AT91M42800A                           | Now          |
| AT91EB55             | AT91M55800A                           | Now          |
| AT91EB40A            | AT91R40008                            | 1Q2002       |
| AT91MEC01            | Universal Memory Extension Card       | Now          |

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### AT89 Series (8-bit Microcontrollers)

| Part Number | Memory Size | Description  | Availability |
|-------------|-------------|--|--------------|
| AT87F51     | 4K x 8      | 80C31 Microcontroller with 4K Bytes OTP QuickFlash®  | Now          |
| AT87F52     | 8K x 8      | 80C32 Microcontroller with 8K Bytes OTP QuickFlash   | Now          |
| AT87F55WD   | 20K x 8     | 80C32 Microcontroller with 20K Bytes OTP QuickFlash  | Now          |
| AT87F51RC   | 32K x 8     | 80C32 Microcontroller with 32K Bytes OTP QuickFlash and 512 Bytes RAM                                | Now          |
| AT89C51     | 4K x 8      | 80C31 Microcontroller with 4K Bytes Flash  | Now          |
| AT89LV51    | 4K x 8      | 2.7-volt, 80C31 Microcontroller with 4K Bytes Flash  | Now          |
| AT89C52     | 8K x 8      | 80C32 Microcontroller with 8K Bytes Flash  | Now          |
| AT89LV52    | 8K x 8      | 2.7-volt, 80C32 Microcontroller with 8K Bytes Flash  | Now          |
| AT89C1051U  | 1K x 8      | 80C31 Microcontroller with 1K Byte Flash, 20-lead Package  | Now          |
| AT89C2051   | 2K x 8      | 80C31 Microcontroller with 2K Bytes Flash, 20-lead Package   | Now          |
| AT89S2051   | 2K x 8      | In-System Programmable 80C31 Microcontroller with 2K Bytes Flash, 160 Bytes of RAM, 512 Bytes EEPROM | 3Q2002       |
| AT89C4051   | 4K x 8      | 80C31 Microcontroller with 4K Bytes Flash, 20-lead Package   | Now          |
| AT89S8252   | 8K x 8      | In-System Programmable 80C32 Microcontroller with 8K Bytes Flash and 2K Bytes EEPROM                 | Now          |
| AT89LS8252  | 8K x 8      | Low-voltage, In-System Programmable 80C32 Microcontroller with 8K Bytes Flash and 2K Bytes EEPROM    | Now          |
| AT89S53     | 12K x 8     | In-System Programmable 80C32 Microcontroller with 12K Bytes Flash                                    | Now          |
| AT89LS53    | 12K x 8     | Low-voltage, In-System Programmable 80C32 Microcontroller with 12K Bytes Flash                       | Now          |
| AT89C55WD   | 20K x 8     | 80C32 Microcontroller with 20K Bytes Flash   | Now          |
| AT89LV55WD  | 20K x 8     | 2.7-volt, 80C32 Microcontroller with 20K Bytes Flash   | 1Q2002       |
| AT89S55WD   | 20K x 8     | In-System Programmable 80C32 Microcontroller with 20K Bytes Flash and 1K Byte RAM                    | 3Q2002       |
| AT89S51     | 4K x 8      | In-System Programmable 80C31 Microcontroller with 4K Bytes Flash                                     | Now          |
| AT89S52     | 8K x 8      | In-System Programmable 80C32 Microcontroller with 8K Bytes Flash                                     | Now          |
| AT87LV55WD  | 20K x 8     | 2.7-volt, 80C32 Microcontroller with 20K Bytes OTP QuickFlash  | 1Q2002       |
| AT87LV51RC  | 32K x 8     | 2.7-volt, 80C32 Microcontroller with 32K Bytes OTP QuickFlash and 512 Bytes RAM                      | 1Q2002       |
| AT89C51RC   | 32K x 8     | 80C32 Microcontroller with 32K Bytes Flash and 512 Bytes RAM   | Now          |
| AT89LV51RC  | 32K x 8     | 2.7-volt, 80C32 Microcontroller with 32K Bytes Flash and 512 Bytes RAM                               | 1Q2002       |
| AT89S51RC   | 32K x 8     | In-System Programmable 80C32 Microcontroller with 32K Bytes Flash and 1K Byte RAM                    | 3Q2002       |

## FPGA Serial Configuration EEPROM

| Part Number                    | Memory Size   | Description   | Availability |
|--------------------------------|---------------|---|--------------|
| <b>Standard Voltage (5.0V)</b> |               |   |              |
| AT17C65                        | 65,536 x 1    | 65K-bit FPGA Configuration EEPROM, 5.0-volt                 | Now          |
| AT17C65A                       | 65,536 x 1    | 65K-bit FPGA Configuration EEPROM, 5.0-volt, Altera Pinout  | Now          |
| AT17C128                       | 131,072 x 1   | 128K-bit FPGA Configuration EEPROM, 5.0-volt                | Now          |
| AT17C256                       | 262,144 x 1   | 256K-bit FPGA Configuration EEPROM, 5.0-volt                | Now          |
| AT17C256A                      | 262,144 x 1   | 256K-bit FPGA Configuration EEPROM, 5.0-volt, Altera Pinout | Now          |
| AT17C512                       | 524,288 x 1   | 512K-bit FPGA Configuration EEPROM, 5.0-volt                | Now          |
| AT17C010                       | 1,048,576 x 1 | 1M-bit FPGA Configuration EEPROM, 5.0-volt                  | Now          |
| AT17C010A                      | 1,048,576 x 1 | 1M-bit FPGA Configuration EEPROM, 5.0-volt, Altera Pinout   | Now          |
| AT17C002                       | 2,097,152 x 1 | 2M-bit FPGA Configuration EEPROM, 5.0-volt                  | Now          |
| AT17C002A                      | 2,097,152 x 1 | 2M-bit FPGA Configuration EEPROM, 5.0-volt, Altera Pinout   | Now          |
| AT17C040A                      | 4,194,304 x 1 | 4M-bit FPGA Configuration EEPROM, 5.0-volt, Altera Pinout   | Now          |
| <b>Low-voltage (3.3V)</b>      |               |   |              |
| AT17LV65                       | 65,536 x 1    | 65K-bit FPGA Configuration EEPROM, 3.3-volt                 | Now          |
| AT17LV65A                      | 65,536 x 1    | 65K-bit FPGA Configuration EEPROM, 3.3-volt, Altera Pinout  | Now          |
| AT17LV128                      | 131,072 x 1   | 128K-bit FPGA Configuration EEPROM, 3.3-volt                | Now          |
| AT17LV256                      | 262,144 x 1   | 256K-bit FPGA Configuration EEPROM, 3.3-volt                | Now          |
| AT17LV256A                     | 262,144 x 1   | 256K-bit FPGA Configuration EEPROM, 3.3-volt, Altera Pinout | Now          |
| AT17LV512                      | 524,288 x 1   | 512K-bit FPGA Configuration EEPROM, 3.3-volt                | Now          |
| AT17LV512A                     | 524,288 x 1   | 512K-bit FPGA Configuration EEPROM, 3.3-volt, Altera Pinout | Now          |
| AT17LV010                      | 1,048,576 x 1 | 1M-bit FPGA Configuration EEPROM, 3.3-volt                  | Now          |
| AT17LV010A                     | 1,048,576 x 1 | 1M-bit FPGA Configuration EEPROM, 3.3-volt, Altera Pinout   | Now          |
| AT17LV002                      | 2,097,152 x 1 | 2M-bit FPGA Configuration EEPROM, 3.3-volt                  | Now          |
| AT17LV002A                     | 2,097,152 x 1 | 2M-bit FPGA Configuration EEPROM, 3.3-volt, Altera Pinout   | Now          |
| AT17LV40                       | 4,194,304 x 1 | 4M-bit FPGA Configuration EEPROM, 3.3-volt                  | Now          |
| AT17LV040A                     | 4,194,304 x 1 | 4M-bit FPGA Configuration EEPROM, 3.3-volt, Altera Pinout   | Now          |

## FPGA Configurator Hardware and Software Tools

| Part Number | Description   | Availability |
|-------------|---|--------------|
| ATDH2200E   | Configurator Program Board, CPS ISP Software, 8-pin and 20 PLCC Adapter | Now          |
| ATDH2221    | 20-pin SOIC (8-pin DIP Adapter)   | Now          |
| ATDH2222    | 20-pin PLCC (8-pin DIP Adapter)   | Now          |
| ATDH2223    | 8-pin SOIC (8-pin DIP Adapter)  | Now          |
| ATDH2224    | 44-pin PQFP (8-pin DIP Adapter)   | Now          |
| ATDH2225    | ISP Download Cable  | Now          |
| ATDH2226    | 32-pin PQFP (8-pin DIP Adapter)   | Now          |
| ATDH2227    | 44-pin PLCC (8-pin DIP Adapter)   | Now          |
| ATDH2227A   | 44-pin PLCC (8-pin DIP Adapter), Altera Pinout                          | Now          |
| ATDH2228    | 8-pin LAP (8-pin DIP Adapter)   | Now          |
| ATDH2225    | ISP Download Cable  | Now          |

## ATMEL PRODUCT GUIDE

### FPGAs – AT40K

| Part Number   | Registers | Usable Gates | Frequency | RAM         | Description                            | Availability |
|---|-----------|--------------|-----------|-------------|--|--------------|
| <b>Standard Voltage (5.0V)</b>                        |           |              |           |             |  |              |
| AT40K05   | 256       | 5K - 10K     | 250 MHz   | 2,048 Bits  | 128 I/O Pins, 5.0-volt, Very Low Power | Now          |
| AT40K10   | 576       | 10K - 20K    | 250 MHz   | 4,096 Bits  | 192 I/O Pins, 5.0-volt, Very Low Power | Now          |
| AT40K20   | 1,024     | 20K - 30K    | 250 MHz   | 8,192 Bits  | 256 I/O Pins, 5.0-volt, Very Low Power | Now          |
| AT40K40   | 2,304     | 40K - 50K    | 250 MHz   | 18,432 Bits | 384 I/O Pins, 5.0-volt, Very Low Power | Now          |
| <b>Low-voltage (3.3V)</b>                             |           |              |           |             |  |              |
| AT40K05LV   | 256       | 5K - 10K     | 250 MHz   | 2,048 Bits  | 128 I/O Pins, 3.3-volt, Very Low Power | Now          |
| AT40K10LV   | 576       | 10K - 20K    | 250 MHz   | 4,096 Bits  | 192 I/O Pins, 3.3-volt, Very Low Power | Now          |
| AT40K20LV   | 1,024     | 20K - 30K    | 250 MHz   | 8,192 Bits  | 256 I/O Pins, 3.3-volt, Very Low Power | Now          |
| AT40K40LV   | 2,304     | 40K - 50K    | 250 MHz   | 18,432 Bits | 384 I/O Pins, 3.3-volt, Very Low Power | Now          |
| <b>Low-voltage Enhanced Performance (3.3 to 2.5V)</b> |           |              |           |             |  |              |
| AT40K05AL   | 512       | 5K - 10K     | 250 MHz   | 2,048 Bits  | 128 I/O Pins, 3.3-volt, Very Low Power | Now          |
| AT40K10AL   | 896       | 10K - 20K    | 250 MHz   | 4,096 Bits  | 192 I/O Pins, 3.3-volt, Very Low Power | Now          |
| AT40K20AL   | 1,440     | 20K - 30K    | 250 MHz   | 8,192 Bits  | 256 I/O Pins, 3.3-volt, Very Low Power | Now          |
| AT40K40AL   | 2,690     | 40K - 50K    | 250 MHz   | 18,432 Bits | 384 I/O Pins, 3.3-volt, Very Low Power | Now          |
| AT40K80AV   | 5,120     | 80K - 100K   | 250 MHz   | 32,768 Bits | 512 I/O Pins, 3.3-volt, Very Low Power | 2Q2002       |
| AT40K125AV  | 7,680     | 125K - 150K  | 250 MHz   | 51,200 Bits | 640 I/O Pins, 3.3-volt, Very Low Power | 3Q2002       |

### FPGA Hardware and Software Tools

| Part Number     | Description  | Availability |
|-----------------|--|--------------|
| <b>Software</b> |  |              |
| ATDS2100PC      | Place and Route Tools (Ordering Also Available from the Web)       | Now          |
| <b>Hardware</b> |  |              |
| ATSTK40         | AVR, AT40K Starter Kit (AVR Studio®, Figaro, Board, AT40K20, etc.) | Now          |
| ATDH40M         | AT40K Prototyping Board, 1 Daughter Board                          | Now          |
| ATDH40D84       | Daughter Board – 84PLCC  | Now          |
| ATDH40D100      | Daughter Board – 100VQFP   | Now          |
| ATDH40D144      | Daughter Board – 144TQFP   | Now          |
| ATDH40D208      | Daughter Board – 208PQFP   | Now          |
| ATDH40D240      | Daughter Board – 240PQFP   | Now          |

### FPGAs – AT6000

| Part Number                    | Registers | Usable Gates | Frequency | Description                            | Availability |
|--------------------------------|-----------|--------------|-----------|--|--------------|
| <b>Standard Voltage (5.0V)</b> |           |              |           |  |              |
| AT6002                         | 1,024     | 6K           | 350 MHz   | 96 I/O Pins, 5.0-volt, Very Low Power  | Now          |
| AT6003                         | 1,600     | 9K           | 350 MHz   | 120 I/O Pins, 5.0-volt, Very Low Power | Now          |
| AT6005                         | 3,136     | 15K          | 350 MHz   | 140 I/O Pins, 5.0-volt, Very Low Power | Now          |
| AT6010                         | 6,400     | 30K          | 350 MHz   | 204 I/O Pins, 5.0-volt, Very Low Power | Now          |
| <b>Low-voltage (3.3V)</b>      |           |              |           |  |              |
| AT6002LV                       | 1,024     | 6K           | 250 MHz   | 96 I/O Pins, 3.3-volt, Very Low Power  | Now          |
| AT6003LV                       | 1,600     | 9K           | 250 MHz   | 120 I/O Pins, 3.3-volt, Very Low Power | Now          |
| AT6005LV                       | 3,136     | 15K          | 250 MHz   | 140 I/O Pins, 3.3-volt, Very Low Power | Now          |
| AT6010LV                       | 6,400     | 30K          | 250 MHz   | 204 I/O Pins, 3.3-volt, Very Low Power | Now          |



**PLDs**

| Part Number                                     | Packages                       | Speeds      | Description  | Availability |
|---|--------------------------------|-------------|--|--------------|
| <b>5.0-volt Electrically Erasable</b>           |                                |             |  |              |
| ATF16V8B  | 20-pin                         | 10 - 15 ns  | 8 FFs, 8 I/O Pins, Standard-power                            | Now          |
| ATF16V8BQ(L)                                    | 20-pin                         | 10 - 15 ns  | 8 FFs, 8 I/O Pins, Quarter-power, Low-power                  | Now          |
| ATF16V8C  | 20-pin                         | 5 - 7.5 ns  | 8 FFs, 8 I/O Pins, Standard-power                            | Now          |
| ATF16V8CZ                                       | 20-pin                         | 12 - 15 ns  | 8 FFs, 8 I/O Pins, Zero-power                                | Now          |
| ATF20V8B  | 24-, 28-pin                    | 7.5 - 15 ns | 8 FFs, 8 I/O Pins, Standard-power                            | Now          |
| ATF20V8BQ(L)                                    | 24-, 28-pin                    | 10 - 15 ns  | 8 FFs, 8 I/O Pins, Quarter-power, Low-power                  | Now          |
| ATF20V8C(Z)                                     | 24-, 28-pin                    | 5 - 15 ns   | 8 FFs, 8 I/O Pins, Standard-power, Zero-power                | 1Q2002       |
| ATF20V8CQ(Z)                                    | 24-, 28-pin                    | 10 - 15 ns  | 8 FFs, 8 I/O Pins, Quarter-power, Zero-power                 | 1Q2002       |
| ATF22V10B                                       | 24-, 28-pin                    | 10 - 15 ns  | 10 FFs, 10 I/O Pins, Standard-power                          | Now          |
| ATF22V10C                                       | 24-, 28-pin                    | 5 - 15 ns   | 10 FFs, 10 I/O Pins, Standard-power                          | Now          |
| ATF22V10CQ(Z)                                   | 24-, 28-pin                    | 15 - 20 ns  | 10 FFs, 10 I/O Pins, Quarter-power, Zero-power               | Now          |
| ATF22V10CZ                                      | 24-, 28-pin                    | 12 - 15 ns  | 10 FFs, 10 I/O Pins, Zero-power                              | Now          |
| ATF750C(L)                                      | 24-, 28-pin                    | 7.5 - 15 ns | 20 FFs, 10 I/O Pins, Standard and Low-power                  | Now          |
| ATF2500CQ(L)                                    | 40-, 44-pin                    | 10 - 25 ns  | 48 FFs, 24 I/O Pins, Standard, Quarter and Low-power         | 4Q2001       |
| ATF1500A(L)                                     | 44-pin                         | 7.5 - 20 ns | 32 Macrocell, Standard and Low-power                         | Now          |
| ATF1502AS(L)                                    | 44-pin                         | 7.5 - 25 ns | 32 Macrocell with ISP, Standard and Low-power                | Now          |
| ATF1504AS(L)                                    | 44-, 68-, 84-, 100-pin         | 7.5 - 20 ns | 64 Macrocell with ISP, Standard and Low-power                | Now          |
| ATF1508AS(L)                                    | 84-, 100-, 160-pin             | 7.5 - 20 ns | 128 Macrocell with ISP, Standard and Low-power               | Now          |
| ATF1502SE(L)                                    | 44-pin                         | 5 - 15 ns   | 32 Macrocells with ISP, Low-power                            | 4Q2001       |
| ATF1504SE(L)                                    | 44-, 68-, 84-, 100-pin         | 5 - 15 ns   | 64 Macrocells with ISP, Low-power                            | 1Q2002       |
| ATF1508SE(L)                                    | 84-, 100-, 160-pin             | 6 - 15 ns   | 128 Macrocells with ISP, Low-power                           | 4Q2001       |
| ATF1516SE(L)                                    | 100-, 208-pin                  | 7 - 15 ns   | 256 Macrocells with ISP, Low-power                           | 2Q2002       |
| <b>Low-voltage (3.3V) Electrically Erasable</b> |                                |             |  |              |
| ATF16LV8C                                       | 20-pin                         | 10 - 15 ns  | 8 FFs, 8 I/O Pins, Low-voltage                               | Now          |
| AT22LV10(L)                                     | 24-, 28-pin                    | 20 - 25 ns  | 10 FFs, 10 I/O Pins, Low-voltage and Low-power (EPROM-based) | Now          |
| ATF22LV10C                                      | 24-, 28-pin                    | 10 - 15 ns  | 10 FFs, 10 I/O Pins, Low-voltage                             | Now          |
| ATF22LV10CZ                                     | 24-, 28-pin                    | 25 ns       | 10 FFs, 10 I/O Pins, Low-voltage, Zero-power                 | Now          |
| ATF22LV10CQZ                                    | 24-, 28-pin                    | 30 ns       | 10 FFs, 10 I/O Pins, Low-voltage, Quarter-power, Zero-power  | Now          |
| ATF750LVC(L)                                    | 24-, 28-pin                    | 15 ns       | 20 FFs, 10 I/O Pins, 3.3-volt and Low-power                  | Now          |
| ATF1500ABV                                      | 44-pin                         | 12 - 15 ns  | 32 FFs, 32 I/O Pins, Low-voltage                             | Now          |
| ATF1502ASV                                      | 44-pin                         | 15 ns       | 32 Macrocells with ISP, 32 I/O Pins, Low-voltage             | Now          |
| ATF1504ASV(L)                                   | 44-, 68-, 84-, 100-pin         | 15 - 20 ns  | 64 Macrocells with ISP, Low-voltage and Low-power            | Now          |
| ATF1508ASV(L)                                   | 84-, 100-, 160-pin             | 15 - 20 ns  | 128 Macrocells with ISP, Low-voltage and Low-power           | Now          |
| ATF1502AE(L)                                    | 44-pin                         | 4 - 15 ns   | 32 Macrocells with ISP, Low-power                            | 4Q2001       |
| ATF1504AE(L)                                    | 44-, 49-, 68-, 84-, 100-pin    | 4 - 15 ns   | 64 Macrocells with ISP, Low-power                            | 1Q2002       |
| ATF1508AE(L)                                    | 84-, 100-, 144-, 169-, 256-pin | 5 - 15 ns   | 128 Macrocells with ISP, Low-power                           | 4Q2001       |
| ATF1516AE(L)                                    | 100-, 144-, 208-, 256-pin      | 5 - 15 ns   | 256 Macrocells with ISP, Low-power                           | 1Q2002       |
| ATF1532AE(L)                                    | 144-, 208-, 256-pin            | 7 - 15 ns   | 512 Macrocells with ISP, Low-power                           | 3Q2002       |
| <b>5.0-volt EPROM-based</b>                     |                                |             |  |              |
| ATV750B(L)                                      | 24-, 28-pin                    | 10 - 15 ns  | 20 FFs, 10 I/O Pins, Standard and Low-power                  | Now          |
| ATV2500B(L)                                     | 44-pin                         | 12 - 20 ns  | 48 FFs, 24 I/O Pins, Standard and Low-power                  | Now          |
| ATV2500BQ(L)                                    | 40-, 44-pin                    | 20 - 25 ns  | 48 FFs, 24 I/O Pins, Quarter-power, Low-power                | Now          |

## ATMEL PRODUCT GUIDE

### PLD Tools – Software and Hardware

| Part Number | Description  | Availability |
|-------------|--|--------------|
| ATDS1500PC  | Atmel – ProChip Designer™ (Includes CUPL, VHDL, Schematic Entry, Synthesis, Functional and Timing Simulation, Place and Route) | Now          |
| ATDS1000PC  | Atmel – WinCUPL™ (Includes CUPL, Compiler, Place and Route)  | Now          |
| ATF15xxDK   | CPLD Development Kit (Includes Software, 2 Sample PLDs, Demo Board and ISP Cable)  | Now          |
| ATDH1150VPC | Atmel – ISP Kit Software and Cable (3V or 5V)  | Now          |
| ATDH1160VPC | Atmel – ISP Programming Board (3V or 5V)   | Now          |
| ATDH1161PC  | Atmel – 44-lead PLCC Adaptor Board   | Now          |
| ATDH1162PC  | Atmel – 44-lead TQFP Adaptor Board   | Now          |
| ATDH1163PC  | Atmel – 68-lead PLCC Adaptor Board   | Now          |
| ATDH1164PC  | Atmel – 100-lead PQFP Adaptor Board  | Now          |
| ATDH1165PC  | Atmel – 100-lead TQFP Adaptor Board  | Now          |
| ATDH1166PC  | Atmel – 160-lead PQFP Adaptor Board  | Now          |

### Gate Arrays/Embedded Arrays

| Device Name                    | Gates      | Pins       | Description   | Availability |
|--------------------------------|------------|------------|---|--------------|
| ATL13 Series                   | 40M        | Up to 2500 | 0.13-micron CMOS Gate Array/Embedded Array, 1.2-volt Operation, 35 Versions with Various Pin and Gate Counts  | 2H2002       |
| ATL18/EE                       | 22M        | Up to 2000 | 0.18-micron CMOS Embedded Array Combining Logic and EEPROM Memory, 1.8-volt Operation, Various Gate Counts, Up to 16M-bit EEPROM Memory   | 2H2002       |
| ATL18/Flash                    | 22M        | Up to 2000 | 0.18-micron CMOS Embedded Array Combining Logic and Flash Memory, 1.8-volt Operation, Various Gate Counts, Up to 64M-bit Flash Memory   | 2H2002       |
| ATL18 Series                   | 22M        | Up to 2000 | 0.18-micron CMOS Gate Array/Embedded Array, 1.8-volt Operation, 30 Versions with Various Pin and Gate Counts  | Now          |
| ATL25 Series                   | Up to 6.9M | Up to 976  | 0.25-micron CMOS Gate Array/Embedded Array, 2.5-volt Operation, 23 Versions with Various Pin and Gate Counts  | Now          |
| ATL25/EE Series                | Up to 6.9M | Up to 976  | 0.25-micron CMOS Embedded Array Combining Logic and EEPROM Memory, 2.5-volt Operation, Various Gate Counts, Up to 4M-bit EEPROM Memory  | 1H2002       |
| ATL25/Flash Series             | Up to 6.9M | Up to 976  | 0.25-micron CMOS Embedded Array Combining CMOS Logic and Flash Memory, 2.5-volt Operation, Various Gate Counts, Up to 32M-bit Flash Memory  | 1H2002       |
| ATL35 Series                   | Up to 2.7M | Up to 976  | 0.35-micron CMOS Gate Array/Embedded Array, 2.5-volt or 3.3-volt Operation, 23 Versions with Various Pin and Gate Counts  | Now          |
| ATL35/EE Series                | Up to 2.7M | Up to 976  | 0.35-micron Embedded Array Combining CMOS Logic and EEPROM Memory, 2.5-volt or 3.3-volt Operation, Various Gate Counts, Up to 512K-bit EEPROM Memory  | Now          |
| ATL35/Flash Series             | Up to 2.7M | Up to 976  | 0.35-micron Embedded Array Combining CMOS Logic and Flash Memory, 2.5-volt or 3.3-volt Operation, Various Gate Counts, Up to 4M-bit Flash Memory  | Now          |
| ATLS60 Series                  | Up to 88K  | Up to 256  | 0.6-micron CMOS Gate Array/Embedded Array, 2.0-volt, 3.3-volt and 5.0-volt Operation, Staggered Row Bond Pads, 8 Versions with Various Pin and Gate Counts  | Now          |
| ATL60 Series                   | Up to 590K | Up to 480  | 0.6-micron CMOS Gate Array/Embedded Array, 2.0-volt, 3.3-volt and 5.0-volt Operation, 16 Versions with Various Pin and Gate Counts  | Now          |
| Processor Cores                |            |            | ARM7TDMI, ARM946E-S™, ARM920T™, AVR RISC, MIPS64™, 5Kf™, 8051, TeakDSPCore®, OakDSPCore® and PalmDSPCore®   | Now          |
| Application-Specific Functions |            |            | 10T/100 Ethernet MAC, SDRAM Controller, 1394 (Firewire), CAN 2.0 A/B, USB 1.1 (Function and Hub), 32/64-bit PCI, 8-bit and 16-bit Timer, USART, SPI, 2-wire, Watchdog and AMBA™-compliant Peripherals, 16C550 UART, AVR Peripherals | Now          |
| Memory                         |            |            | Flash, EE, SRAM, DPSRAM, ROM, FIFO  | Now          |
| Analog                         |            |            | 10-bit ADC, 10-bit DAC, PLL, POR, Comparator, Op-amp, Analog Mux, Brown-out Detector, R-C Oscillator, 16-bit Voice Codec, 10T/100 Ethernet PHY  | Now          |
| I/O Interfaces                 |            |            | CMOS, LVTTTL, PCI, USB, LVDS  | Now          |

**Cell-based ICs**

| Part Number                      | Description   | Availability |
|----------------------------------|---|--------------|
| ATC13                            | 0.13-micron 4/8-layer Metal CMOS, 1.2-volt Operation  | 1H2002       |
| ATC18                            | 0.18-micron 4/6-layer Metal CMOS, 1.8-volt to 0.9-volt Operation  | Now          |
| ATC18/EE                         | 0.18-micron 4/6-layer Metal CMOS with Embedded EEPROM, 1.8-volt to 0.9-volt Operation   | 1H2002       |
| ATC20                            | 0.21-micron 3/5-layer Metal CMOS, 1.95-volt to 1.65-volt Operation  | Now          |
| ATC20/Flash                      | 0.21-micron 3/5-layer Metal Flash with Embedded CMOS, 1.45-volt to 1.65-volt Operation  | Now          |
| ATC25                            | 0.25-micron 3/5-layer Metal CMOS, 2.5-volt to 0.9-volt Operation, Digital, Memory, MCU/DSP Cores, Peripherals, Analog, Macrocells   | Now          |
| ATC25/EE                         | 0.25-micron 3/5-layer Metal CMOS with Embedded EEPROM, 2.5-volt to 0.9-volt Operation   | Now          |
| ATC35/EE                         | 0.35-micron 3/5-layer Metal CMOS with Embedded EEPROM, 3.3-volt to 1.8-volt Operation   | Now          |
| ATC35/Flash                      | 0.35-micron 3/5-layer Metal Flash with Embedded CMOS, 3.3-volt to 1.8-volt Operation  | Now          |
| Memory Blocks                    | RAM, Dual-port RAM, ROM, Flash, EEPROM  | Now          |
| MCU/DSP Cores                    | ARM920T™, ARM946E-S™, ARM7TDMI™ (ARM® Thumb®), MIPS64™ 5KC™, AVR, OakDSP-Core®, PalmDSPCore®, TeakDSPCore®, mAgic Modular VLIW Computation Core   | Now          |
| ARM System Peripherals           | Bus Interface, Arbiter, Bridge, Cache Memory and Bus Interface Unit, Debug Unit   | Now          |
| ARM Peripherals                  | Advanced Power Management Controller, Peripheral Data Controller, Static Memory Controller, Burst Flash Controller, Parallel Input/Output, Data Encryption Standard, Advanced Interrupt Controller, Real-time Clock, Watchdog Timer, Timer/Counter, System Timer, Serial Peripheral Interface, USB V1.1 Device, USART | Now          |
| AVR-compatible 8-bit Peripherals | Real-time Clock, Serial Peripheral Interface, Timer Counter, UART, USB V1.1 Device, Watchdog Timer  | Now          |
| Analog Cells                     | A/D, D/A, OpAmp, Comp, PLL, Oscillator, I/Q Modem, Voice Codec, Bandgap Reference   | Now          |
| Macrocells                       | AT40K FPGA, AT8032, AT146818, AT160450, PCI, SPI, USB, CAN 2B, Ethernet MAC, Codec  | Now          |

**High-reliability Mixed Signal ASIC**

| Part number    | Description   | Availability |
|----------------|---|--------------|
| TSME4 Alliance | 0.8 µm 2ML/2Poly, EEPROM, 1400 Gates/mm <sup>2</sup> Digital Cells, Up to 4K-bit EEPROM, Enhanced 0.8 µm CMOS Mixed Signal ASIC | Now          |

**Storage Products – Digital Versatile Disk**

| Part Number | Description                                   | Package       | Availability |
|-------------|---|---------------|--------------|
| AT78C1501   | DVD/CD Interface Controller Ultra DMA 66 Mb/s | 208-lead LQFP | Now          |
| AT78C1502   | DVD/CD Servo Controller                       | 128-lead LQFP | Now          |
| AT78C1503   | DVD/CD Read Channel 160 Mb/s                  | 100-lead LQFP | Now          |
| AT78C1504   | DVD/CD Laser Power Controller                 | 48-lead LQFP  | Now          |
| AT78C1505   | DVD/CD Read Pre-Amp                           | 48-lead LQFP  | Now          |

## ATEL PRODUCT GUIDE

### Wireless

| Part Number  | Description   | Availability |
|--|---|--------------|
| AT76C502A-OT144  | 11M-bit WLAN Media Access Controller, IEEE 802.11b Standard, Provides All Processing and Functionality Needed for the MAC Protocol of Wireless LANs, Auto Fallback to 5.5, 2, 1, PCMCIA Interface | Now          |
| AT76C503A-OT128  | 11M-bit WLAN Media Access Controller, IEEE 802.11b Standard, Provides All Processing and Functionality Needed for the MAC Protocol of Wireless LANs, Auto Fallback to 5.5, 2, 1, USB Interface    | Now          |
| AT76C504-OZ160   | 11M-bit WLAN Media Access Controller, IEEE 802.11b Standard, Provides All Processing and Functionality Needed for the Integrated MAC + BB Chip with PCMCIA Interface                              | 1Q2002       |
| AT76C505-OZ128   | 11M-bit WLAN Media Access Controller, IEEE 802.11b Standard, Provides All Processing and Functionality Needed for the Integrated MAC + BB Chip  | 1Q2002       |
| AT76C506-OZ160   | 11M-bit WLAN Media Access Controller, IEEE 802.11b Standard, Provides All Processing and Functionality Needed for the Integrated MAC + BB Chip with PCI/Mini-PCI Interface                        | 1Q2002       |
| AT76C507   | 11M Bits/second MAC Chip with a USB Host Controller Interface (Package to be Announced)   | 1Q2002       |
| AT76C510-0Q128/<br>AT76C510-0T128                                | Single Chip that Bridges Wireless (802.11b) to 10/100 Ethernet (802.3)  | Now          |
| AT76C511-0L208   | AT76C510 with Further Integration (Additional 10/100, UART, 32-bit EMI to SDRAM, SPI)   | 1Q2002       |
| AT76C551-0T176   | Bluetooth™ Baseband and MAC (0.35 Microns) (PCMCIA, UART)   | Now          |
| AT76C552-1-0Z176/<br>AT76C552-1-0L176                            | Bluetooth Baseband and MAC (0.21 Microns) PCMCIA, Not Pin-to-pin Compatible with AT76C551-0T176   | 1Q2002       |
| AT76C553-1-0Z144/<br>AT76C553-2-0Z082/<br>AT76C553-3-0Z082 (MCM) | Bluetooth Baseband and MAC (0.21 Microns) USB Interface, Not Pin-to-Pin Compatible with AT76C551-0T176  | 1Q2002       |
| AT76C554-3-0Z144/<br>AT76C554-2-0Z082/<br>AT76C554-1-0Z082 (MCM) | Bluetooth Baseband and MAC (0.21 Microns) UART Interface, Not Pin-to-pin Compatible with AT76C551-0T176   | 1Q2002       |
| AT76C901-0G208   | IP Telephony Chip (VoIP) for Business Telephones (Wireless Over 802.11) Includes Two ARM7's OakDSPCore and Voice Codecs   | Now          |

### SmartRF™ – Wireless Data Communications

| Part Number | Description  | Availability |
|-------------|--|--------------|
| AT86RF211   | Single Chip FSK Transceiver for ISM Applications from 400 to 930 MHz (Includes Frequency Hopping), Output Power > 10 dBm, Fast and Accurate Synthesizer Simple 100% Digital Interface, 48-lead TQFP                                    | Now          |
| AT86RF401   | RF Wireless Data Transmitter, 264 to 456 MHz, PLL-based RF Transmitter and 8-bit AVR Microcontroller Core On Single Die, 2-volt Operation, 2K Bytes Flash Program, 128 Bytes EEPROM, Supports 00K Modulation to 20 Kb/s, 20-lead TSSOP | 4Q2001       |

### SmartRF Development Kits – Wireless Data Communications

| Part Number         | Description   | Availability |
|---------------------|---|--------------|
| AT86RF211-DK433/107 | 433 MHz Frequency, 2 AVR Boards (Each of Them with Daughter Board), Embedded Demos for Immediate Use, In-System Programming Possibility | Now          |
| AT86RF211-DK868107  | 868 MHz Frequency, 2 AVR Boards (Each of Them with Daughter Board), Embedded Demos for Immediate Use, In-System Programming Possibility | Now          |
| AT86RF211-DK915107  | 915 MHz Frequency, 2 AVR Boards (Each of Them with Daughter Board), Embedded Demos for Immediate Use, In-System Programming Possibility | Now          |

## Audio

| Part Number    | Description   | Availability |
|----------------|---|--------------|
| AT76C202-0T100 | Dolby Digital AC-3 is a Perpetual Digital Audio Coding Technique, Capable of Producing Up to Six Channels (5.1) of Sound. It May Be Implemented as the Audio Format for MPEG-2-based Systems. The AC-3 Standard Allows for a Variable Number of Audio Channels. | Now          |
| AT76C210-0C128 | Highly Integrated Audio Processor for Hand-held Devices Running MP3, WMA, AAC, Including USB, DACs and Voice Codecs, 128-ball BGA Package   | 4Q2001       |
| AT76C210-0C208 | Highly Integrated Audio Processor for Hand-held Devices Running MP3, WMA, AAC, Including USB, DACs and Voice Codecs, 208-ball BGA Package   | 4Q2001       |

## Imaging Multimedia and Digital Broadcasting

| Part Number    | Description   | Availability      |
|----------------|---|-------------------|
| AT76C110-0C280 | Highly Integrated Solution for Digital Cameras, Image ACQ and Capture from Either CCD or CMOS Imagers, Image Display, Processing and Storage, Overall CAM Management, Based on ARM7 Microprocessor. 30 Frame/sec, Supports 16 Megapixel CCDS, Interface to 16-256 SDRAM | Now               |
| AT76C111-0C280 | Digital Camera Single-chip (SD Support, 32K Bytes of Internal RAM), Shrink of 110 Part – 0.21 Microns, Not Pin-to-pin Compatible with AT76C110-0C280  | Samples<br>4Q2001 |
| AT76C112-0C160 | Unified Memory Architecture, Boot from Serial Memories, 49 MHz ARM Subsystem with Full Cache Support, 1.8V Core and 3.3V I/O  | Samples<br>1Q2002 |
| AT76C113-0C280 | Digital Camera Single-chip High-end DSC Product, Greater Processing Power, VGA, SVGA, XVGA Support, Mini-host USB, 40 MHz ARM Subsystem with Full Cache Support, DMA Engines to Transfer Data to/from All Peripherals 1.8V Core and 3.3V I/O                            | Samples<br>1Q2002 |

## Multimedia and Digital

| Part Number     | Description  | Availability |
|-----------------|--|--------------|
| AT76C651B-0T144 | Integrated DVB <sup>®</sup> -compliant QAM Demodulator with Integrated ADC | Now          |

## Multimedia Video

| Part Number    | Description | Availability    |
|----------------|-------------|-----------------|
| AT76C301-0Q208 | Core Only   | IP Core<br>Only |

## Internet Appliances

| Part Number | Description  | Availability |
|-------------|--|--------------|
| AT75C220    | Smart Internet Appliance Processor – Ethernet, 208-lead PQFP | Now          |
| AT75C310    | Smart Internet Appliance Processor, 160-lead PQFP            | Now          |
| AT75C320    | Smart Internet Appliance Processor 2, 160-lead PQFP          | 2H2001       |

## ATMEL PRODUCT GUIDE

### Evaluation Kits Available for the Following Products (For Prequalified Customers)

| Family Name          | Part Number       | Description  | Availability |
|----------------------|-------------------|--|--------------|
| Digital Camera       | AT76C111-EK       | Kit Includes: Sensor with Lens Assembly, SDRAM, Parallel Flash, LCD Viewfinder, JTAG/USB/RS232/Video Out/Audio Connector, Flash Card, Software Manual  | Now          |
| Bluetooth            | AT76C551-EK       | Kit Includes: Two PCMCIA Cards, Software Utilities, Firmware, Drivers, Software Manual (Silicon Wave Radio), Documentation   | Now          |
| Multimedia & Digital | AT76C651B-EK      | Kit Includes: Board, Parallel Printer Cable, Software Manual, Documentation  | Now          |
| Wireless             | AT76C502A-EK-RFMD | Kit Includes: Two 11M-bit PCMCIA Cards with Integrated Radio Based on RF Microdevices Radio Front-end, Firmware, Drivers, Software Manual, Documentation and Software Utilities                  | Now          |
| Wireless             | AT76C503A-EK-RFMD | Kit Includes: Two 11M-bit USB Dongle Cards with Integrated Radio Based on RF Microdevices Radio Front-end, Two USB Cables, Software Utilities, Firmware, Drivers, Software Manual, Documentation | Now          |
| Wireless             | AT76C510-EK       | Kit Includes: Bridge Access PT Board with Integrated Intersil Radio, Two Antennas, USB Cable, Firmware, Software Manual (Does not Include any Client Cards)                                      | Now          |
| Wireless             | AT76C711-EK       | Kit Includes: Board, Firmware, Drivers, Schematics, Demo Software and Manual   | Now          |

### Development Kits Available for the Following Products (For Prequalified Customers)

| Family Name | Part Number       | Description  | Availability |
|-------------|-------------------|--|--------------|
| Audio       | AT76C210-DK       | Kit Includes: Main Board, Software Manual and Schematics   | 1Q2002       |
| Bluetooth   | AT76C55X-DK       | Kit Includes: Two Boards with BB and RF, Three Physical Interfaces to Host (PCMCIA, USB, UART), Two Power Supplies, Two Serial Cables, Two PCMCIA Cables, Speakers, Microphone, Firmware Up through HCI Transport, Software Up Through L2CAP, Software Manual, Documentation | Now          |
| VoIP        | AT76C901-DK       | Kit Includes: Main Board, Memory Board (Flash SRAM), Software Manual, Documentation  | Now          |
| Wireless    | AT76C502A-DK-RFMD | Kit Includes: One Development Board, Firmware, Drivers, Software Utilities, Software Manual, Documentation and Macless Card  | Now          |
| Wireless    | AT76C503A-DK-RFMD | Kit Includes: One Development Board, USB Cable, Software Utilities, Firmware, Drivers, Software Manual, Documentation and Macless Card   | Now          |
| Wireless    | AT76C510-DK       | Kit Includes: Bridge Board, USB Cable, Firmware, Macless Card, Software Manual, Documentation  | Now          |

Note: Other development tools may be available. For more information, please contact the Multimedia and Communications Group at (919) 462-6540.

## Digital Power Metering

| Part Number | Description                                  | Availability |
|-------------|--|--------------|
| AT73C500    | DSP for 3-phase kWh Meters                   | Now          |
| AT73C501    | 6-channel ADC (Single Ended)                 | Now          |
| AT73C502    | 6-channel ADC (Diff. Ended)                  | Now          |
| AT73C540    | kWh Meter Engine for 1-phase Meters          | 1Q2002       |
| AT73C550    | kWh Meter Engine for Advanced 1-phase Meters | 1Q2002       |

## Digital Power Metering Evaluation Kits

| Part Number | Description                                       | Availability |
|-------------|---|--------------|
| ATEK500     | Evaluation Kit for AT73C500 and AT73C501 Chip Set | Now          |
| ATEK550     | Evaluation Kit for AT73C550                       | Now          |

## Smart Card ICs – CryptoMemory™ (Asynchronous Secure Memory)

| Part Number  | Organization   | Voltage    | Description   | Availability |
|--------------|----------------|------------|---|--------------|
| AT88SC0104C  | 4 (32 x 8)     | 2.7 - 5.5V | 1K-bit User Memory with Authentication and Encryption   | Now          |
| AT88SC0204C  | 4 (64 x 8)     | 2.7 - 5.5V | 2K-bit User Memory with Authentication and Encryption   | Now          |
| AT88SC0404C  | 4 (128 x 8)    | 2.7 - 5.5V | 4K-bit User Memory with Authentication and Encryption   | Now          |
| AT88SC0808C  | 8 (128 x 8)    | 2.7 - 5.5V | 8K-bit User Memory with Authentication and Encryption   | Now          |
| AT88SC1616C  | 16 (128 x 8)   | 2.7 - 5.5V | 16K-bit User Memory with Authentication and Encryption  | Now          |
| AT88SC6416C  | 16 (512 x 8)   | 2.7 - 5.5V | 64K-bit User Memory with Authentication and Encryption  | 1Q2002       |
| AT88SC12816C | 16 (1,024 x 8) | 2.7 - 5.5V | 128K-bit User Memory with Authentication and Encryption | 1Q2002       |
| AT88SC25616C | 16 (2,048 x 8) | 2.7 - 5.5V | 256K-bit User Memory with Authentication and Encryption | 1Q2002       |

## Smart Card ICs – Secure Memory

| Part Number   | Organization | Voltage    | Description  | Availability |
|---|--------------|------------|--|--------------|
| <b>Secure Memory ICs with Password and Authentication</b> |              |            |  |              |
| AT88SC153   | 3 (512 x 1)  | 2.7 - 5.5V | 1.5K EEPROM with Authentication, Three 512-bit Zones | Now          |
| AT88SC1608  | 8 (2K x 1)   | 2.7 - 5.5V | 16K EEPROM with Authentication, Eight 2-Kbit Zones   | Now          |
| <b>Secure Memory ICs with Password</b>                    |              |            |  |              |
| AT88SC101   | 1,024 x 1    | 2.7 - 5.5V | 1K EEPROM with Password Security, One 1,024-bit Zone | Now          |
| AT88SC102   | 2 (512 x 1)  | 2.7 - 5.5V | 1K EEPROM with Password Security, Two 512-bit Zones  | Now          |

## Embedded Security Processors

| Part Number | I/O Interface | Description  | Availability |
|-------------|---------------|--|--------------|
| AT90SP0801  | SMBus         | Embedded Security Processor for PCs, Secure Key Storage (2 Keys), 1024/RSA Sign in 700 ms                                      | Now          |
| AT97SC3201  | LPC           | Fully TCPA Compliant Security Processor, Secure Key Storage (10+ Keys), RNG, SHA-1, Software Auditing, 1024/RSA Sign in 100 ms | 4Q2001       |

## ATMEL PRODUCT GUIDE

### Smart Card ICs – Vocal Authentication

| Part Number | Organization | Voltage    | Description  | Availability |
|-------------|--------------|------------|--|--------------|
| AT88SCV002  | 256 x 1      | 2.4 - 5.5V | 2-wire, 256-bit EEPROM with Security for Online Authentication | Now          |

### Smart Card ICs – Serial Memory

| Part Number                    | Organization    | Voltage    | Description                      | Availability |
|--------------------------------|-----------------|------------|----------------------------------|--------------|
| <b>Serial EEPROMs (2-wire)</b> |                 |            |                                  |              |
| AT24C1024SC                    | 131,072 x 8     | 2.7 - 5.5V | 2-wire, 1,024K-bit Serial EEPROM | Now          |
| AT24C01ASC                     | 128 x 8         | 2.7 - 5.5V | 2-wire, 1K-bit Serial EEPROM     | Now          |
| AT24C02SC                      | 256 x 8         | 2.7 - 5.5V | 2-wire, 2K-bit Serial EEPROM     | Now          |
| AT24C04SC                      | 512 x 8         | 2.7 - 5.5V | 2-wire, 4K-bit Serial EEPROM     | Now          |
| AT24C08SC                      | 1,024 x 8       | 2.7 - 5.5V | 2-wire, 8K-bit Serial EEPROM     | Now          |
| AT24C16SC                      | 2,048 x 8       | 2.7 - 5.5V | 2-wire, 16K-bit Serial EEPROM    | Now          |
| AT24C32SC                      | 4,096 x 8       | 2.7 - 5.5V | 2-wire, 32K-bit Serial EEPROM    | Now          |
| AT24C64SC                      | 8,192 x 8       | 2.7 - 5.5V | 2-wire, 64K-bit Serial EEPROM    | Now          |
| AT24C128SC                     | 16,384 x 8      | 2.7 - 5.5V | 2-wire, 128K-bit Serial EEPROM   | Now          |
| AT24C256SC                     | 32,768 x 8      | 2.7 - 5.5V | 2-wire, 256K-bit Serial EEPROM   | Now          |
| AT24C512SC                     | 65,536 x 8      | 2.7 - 5.5V | 2-wire, 512K-bit Serial EEPROM   | Now          |
| <b>Serial EEPROMs (3-wire)</b> |                 |            |                                  |              |
| AT93C46SC                      | 128 x 8/64 x 16 | 2.7 - 5.5V | 3-wire, 1K-bit Serial EEPROM     | Now          |
| <b>Serial DataFlash</b>        |                 |            |                                  |              |
| AT45DB041BSC                   | 2,048 x 264 x 8 | 2.7 - 3.6V | SPI, 4M-bit, Serial DataFlash    | Now          |

### CryptoMemory and Secure Memory Evaluation/Development Kits

| Part Number     | Description  | Availability |
|-----------------|--|--------------|
| AT88SC1616C-EK  | 1K to 16K CryptoMemory Evaluation Kit                        | Now          |
| AT45DB041BSC-EK | AT45DB041BSC Evaluation Kit and Application Examples         | 4Q2001       |
| AT88SC153-EK    | AT88SC153 Evaluation Kit and Application Examples            | Now          |
| AT88SC1608-EK   | AT88SC1608 Evaluation Kit and Application Examples           | Now          |
| AT88SC1616C-DK  | 1K to 16K CryptoMemory Development Kit Including Source Code | 4Q2001       |
| AT45DB041BSC-DK | AT45DB041BSC Development Kit Including Source Code           | 4Q2001       |
| AT88SC153-DK    | AT88SC153 Development Kit Including Secure Function          | Now          |
| AT88SC1608-DK   | AT88SC1608 Development Kit Including Secure Function         | Now          |



## Secure Microcontrollers for Smart Card Applications (AT90SC Family)<sup>(1)</sup>

| Part Number     | RAM  | ROM  | Flash | EEPROM | Power Supply | Crypto Engine | Other Features   | Availability       |
|-----------------|------|------|-------|--------|--------------|---------------|--|--------------------|
| AT90SC3232      | 1.5K | 0    | 32K   | 32K    | 3V - 5V      | No            |  | Now                |
| AT90SC3232C     | 1.5K | 0    | 32K   | 32K    | 3V - 5V      | Yes           | Common Criteria EAL4+ Target                             | Now <sup>(2)</sup> |
| AT90SC6432R     | 1.5K | 64K  | 0     | 32K    | 3V - 5V      | No            | CRC (Cyclic Redundancy Check)                            | Now                |
| AT90SC6464C     | 3K   | 0    | 64K   | 64K    | 3V - 5V      | Yes           | Hardware DES, CRC, Common Criteria EAL4+ Target          | Now                |
| AT90SC4816R     | 1.5K | 48K  | 0     | 16K    | 3V - 5V      | No            |  | Now                |
| AT90SC320856    | 1.5K | 32K  | 8K    | 56K    | 3V - 5V      | No            |  | Now                |
| AT90SC19264RC   | 6K   | 192K | 0     | 64K    | 3V - 5V      | Yes           | Hardware DES, CRC, Common Criteria EAL4+ Target          | 1Q2002             |
| AT90SC12032R    | 4K   | 120K | 0     | 32k    | 3V - 5V      | No            | CRC  | 1Q2002             |
| AT90SC9616RC    | 3K   | 96K  | 0     | 16K    | 3V - 5V      | Yes           | Hardware DES, CRC, Common Criteria EAL4+ Target          | 1Q2002             |
| AT90SC6464C-USB | 3K   | 0    | 64K   | 64K    | 3V - 5V      | Yes           | On-chip USB Interface, CRC, Common Criteria EAL4+ Target | 1Q2002             |

Notes: 1. All AT90SC Family products have OTP EEPROM area (One Time Programmable), "out-of-bounds" detectors and Random Number Generators (RNG).  
 2. The AT90SC3232C product available now is a 0.5µ device with 1K of RAM and is not a Common Criteria EAL4+ Target.

## Development Tools for AT90SC Family Microcontrollers

| Part Number                                      | Description  | Availability                |
|--|--|-----------------------------|
| <b>AT90SC Family Emulation Platform Support</b>  |  |                             |
| ATV1   | Voyager Development Platform for the AT05SC, AT90SC and AT91SC Family Microprocessors. Contact Your Local Atmel Sales Office for a List of Devices Supported in this Platform. | Now                         |
| AT90SC6464C-POD+                                 | Real-time Emulation Support for the AT90SC6464C  | Now                         |
| AT90SCSDK  | Smart Card Development Kit for AT90SC3232, AT90SC3232C, AT90SC320856, AT90SC4816R and AT90SC6432R  | Now                         |
| <b>AT90SC Family Simulation Platform Support</b> |  |                             |
| AT90SCSIM  | AT90SC Family Simulation Disk Supporting:<br>AT90SC6464C<br>AT90SC320856<br>AT90SC4816R<br>AT90SC9616RC  | Now<br>Now<br>Now<br>4Q2001 |
| AT90SCSPBR                                       | Serial Peripheral Board for Use with All AT90SC Family Software Simulators   | Now                         |

## High-end Security Products – ARM-based

| Part Number | Program Memory ROM | User Memory Flash/EEPROM | SRAM     | Power Supply | Crypto Engine     | I/O                      | Availability |
|-------------|--------------------|--------------------------|----------|--------------|-------------------|--------------------------|--------------|
| AT91SC321RC | 96K Bytes          | 64K Bytes                | 5K Bytes | 3.3V - 5V    | DES, PKI Skipjack | USB, ISO7816, SMBUS, SPI | 1Q2002       |

## Development Tools for High-end Security Products

| Part Number  | Features                                     | Availability |
|--------------|--|--------------|
| AT91SC321SDT | Software Development Toolkit for AT91SC321RC | Now          |

## ATMEL PRODUCT GUIDE

### Secure ICs for Smart Cards – Contactless (RFID)

| Part Number     | EEPROM Memory | Features   | Availability |
|-----------------|---------------|--|--------------|
| AT88RF020       | 2K Bits       | ISO 14443-2B and -3 Compliant  | Now          |
| AT88RF256-12    | 256 Bits      | 125 kHz Read/Write RFID Transponder with Passwords and Data Locking          | Now          |
| AT88RF256-13    | 256 Bits      | 13.56 MHz Read/Write RFID Transponder  | Now          |
| AT24RF08C       | 8K Bits       | Read/Write Multi-tag, Asset Identification Transponder with Serial Interface | Now          |
| AT88RF001       | 256 Bits      | 13.56 MHz RFID External Memory Interface Chip                                | Now          |
| AT24RF08-EK     |               | Evaluation Kit   | Now          |
| AT88RF256-13-EK |               | Evaluation Kit   | Now          |
| AT88RF001-EK    |               | Evaluation Kit   | Now          |

### Secure Microcontrollers for Smart Card Applications (AT05SC Family)

| Part Number  | RAM  | ROM | Flash | EEPROM | Power Supply | Crypto Engine | Other Features   | Availability |
|--------------|------|-----|-------|--------|--------------|---------------|--|--------------|
| AT05SC1604R  | 1K   | 16K | 0     | 4K     | 3V - 5V      | No            | OTP EEPROM Area, Common Criteria EAL4+ Target  | Now          |
| AT05SC2408R  | 512  | 24K | 0     | 8K     | 3V - 5V      | No            | OTP EEPROM Area  | Now          |
| AT05SC3204R  | 512  | 32K | 0     | 4K     | 3V - 5V      | No            | OTP EEPROM Area, Hardware DES, Common Criteria EAL4+ Target  | 4Q2001       |
| AT05SC3208R  | 1K   | 32K | 0     | 8K     | 3V - 5V      | No            | OTP EEPROM Area, Hardware DES, Common Criteria EAL4+ Target  | 4Q2001       |
| AT05SC4616R  | 1.5K | 46K | 0     | 16K    | 3V - 5V      | No            | Hardware DES   | Now          |
| AT05SC4808RF | 1K   | 48K | 0     | 8K     | 3V - 5V      | No            | RF Contactless Interface (Full Support for ISO/IEC 14443 Type B Protocol), OTP EEPROM Area. Hardware DES | 1Q2002       |

Note: All AT05SC Family products have "out-of-bounds" detectors, hardware DPA/SPA protection, Cyclic Redundancy Check (CRC) Module and Random Number Generators (RNG).

### Development Tools for AT05SC Family Microcontrollers

| Part Number                                      | Description  | Availability      |
|--|--|-------------------|
| <b>AT05SC Family Emulation Platform Support</b>  |  |                   |
| AT05SC4616R-EM3                                  | AT05SC3R Emulation Platform Support for the AT05SC4616R                                | Now               |
| AT05SC3208R-EM3-E                                | AT05SC3R Emulation Platform Support for the AT05SC3208R                                | 4Q2001            |
| AT05SC2408R-EM3                                  | AT05SC3R Emulation Platform Support for the AT05SC2408R                                | Now               |
| AT05SC1604R-EM3                                  | AT05SC3R Emulation Platform Support for the AT05SC1604R                                | Now               |
| AT05SC4808RF-EM3                                 | AT05SC3RF Emulation Platform Support for the AT05SC4808RF                              | 1Q2002            |
| <b>AT05SC Family Simulation Platform Support</b> |  |                   |
| AT05SCRSIM                                       | AT05SC Family Simulation Disk Supporting:<br>AT05SC4616R<br>AT05SC2408R<br>AT05SC1604R | Now<br>Now<br>Now |
| AT05SCSPBR                                       | Serial Peripheral Board for Use with All AT05SC Family Software Simulators             | Now               |

**FingerChip™**

| Part Number     | Power Consumption | Description   | Evaluation Board                                  | Availability |
|-----------------|-------------------|---|---|--------------|
| FCD4B14C        | 20 mW at 3.3V     | 500 dpi, 0.4 mm x 14.0 mm Digital Fingerprint Linear Sensor, 2240 Pixels (8 x 280) Image Array, Digital Output (On-chip ADC) 20-pin DIL Package           | "Sweepsee" Fingerprint Identification USB Scanner | Now          |
| AT77C101B-CB01C | 20 mW at 3.3V     | 500 dpi, 0.4 mm x 14.0 mm Digital Fingerprint Linear Sensor, 2240 Pixels (8 x 280) Image Array, Digital Output (On-chip ADC)                              | "Sweepsee2"                                       | Now          |
| AT77C101B-CB02C | 20 mW at 3.3V     | 500 dpi, 0.4 mm x 14.0 mm Digital Fingerprint Linear Sensor, 2240 Pixels (8 x 280) Image Array, Digital Output (On-chip ADC) with Board to Flex Connector | "Sweepsee2"                                       | 1Q2002       |

**40 MHz Linescan Cameras**

| Part Number | Rate Line/Sec | Description  | Availability |
|-------------|---------------|--|--------------|
| TH78CA14    | 19000         | Digital RS422 Output, ±5V/+15V Power Supplies, High-speed 8/12-bit Linescan Cameras, 1024 x 2048 Pixels (2048 Active Pixels) | Now          |
| TH78CD14    | 19000         | Digital RS644 Output, ±5V/+15V Power Supplies, High-speed 8/12-bit Linescan Cameras, 1024x 2048 Pixels (2048 Active Pixels)  | Now          |
| TH78CA15    | 9500          | Digital RS422 Output, ±5V/+15V Power Supplies, High-speed 8/12-bit Linescan Cameras, 4096 Pixels (4096 Active Pixels)        | Now          |
| TH78CD15    | 9500          | Digital RS644 Output, ±5V/+15V Power Supplies, High-speed 8/12-bit Linescan Cameras, 4096 Pixels (4096 Active Pixels)        | Now          |
| TH78CE13    | 38000         | Digital RS422 Output, +24V Power Supply, High-speed 8/12-bit Linescan Cameras, 1024 x 2048 Pixels (1024 Active Pixels)       | Now          |
| TH78CH13    | 38000         | Digital RS644 Output, +24V Power Supply, High-speed 8/12-bit Linescan Cameras, 1024 x 2048 Pixels (1024 Active Pixels)       | Now          |
| TH78CE14    | 19000         | Digital RS422 Output, +24V Power Supply, High-speed 8/12bit linescan cameras, 1024x2048 pixels (2048 Active Pixels)          | Now          |
| TH78CH14    | 19000         | Digital RS644 Output, +24V Power Supply, High-speed 8/12-bit Linescan Cameras, 1024 x 2048 Pixels (2048 Active Pixels)       | Now          |
| TH78CE15    | 9500          | Digital RS644 Output, +24V Power Supply, High-speed 8/12-bit Linescan Cameras, 4096 Pixels (4096 Active Pixels)              | Now          |
| TH78CH15    | 9500          | Digital RS644 Output, +24V Power Supply, High-speed 8/12-bit Linescan Cameras, 4096 Pixels (4096 Active Pixels)              | Now          |

**Full Frame Cameras**

| Part Number        | Frames/Sec | Description   | Availability |
|--------------------|------------|---|--------------|
| Camelia™ 1.6M      | 10.0       | 1.6 Megapixel Digital Camera, 12-bit Output, 1536 x 1024 Pixels           | Now          |
| Camelia Color 1.6M | 10.0       | 1.6 Megapixel Digital Color Camera, 3 x 12-bit Output, 1536 x 1024 Pixels | Now          |
| Camelia 2.5M       | 3.0        | 2.5 Megapixel Digital Camera, 12-bit Output, 1840 x 1360 Pixels           | Now          |
| Camelia Color 2.5M | 3.0        | 2.5 Megapixel Digital Color Camera, 3 x 12-bit Output, 1840 x 1360 Pixels | Now          |
| Camelia 4M         | 4.3        | 4 Megapixel Digital Camera, 12-bit Output, 2048 x 2048 Pixels             | Now          |
| Camelia Color 4M   | 4.3        | 4 Megapixel Digital Color Camera, 3 x 12-bit Output, 2048 x 2048 Pixels   | Now          |
| Camelia 8M         | 2.7        | 8 Megapixel Digital Camera, 12-bit Output, 3500 x 2300 Pixels             | Now          |
| Camelia Color 8M   | 2.7        | 8 Megapixel Digital Color Camera, 3 x 12-bit Output, 3500 x 2300 Pixels   | Now          |

**CCD Linear Arrays**

| Part Number | Description  | Antiblooming | Availability |
|-------------|--|--------------|--------------|
| TH7804A     | 1024 Pixels, 13 x 13 Pixel Size, 6000 MHz Dynamic Range, 20 MHz Maximum Data Rate, 2 Outputs     | No           | Now          |
| TH7813A     | 1024 Pixels, 10 x 10 Pixel Size, 6600 MHz Dynamic Range, 50 MHz Maximum Data Rate, 2 Outputs     | Yes          | Now          |
| TH7814A     | 2048 Pixels, 10 x 10 Pixel Size, 6600 MHz Dynamic Range, 50 MHz Maximum Data Rate, 2 Outputs     | Yes          | Now          |
| TH7815A     | 4096 Pixels, 10 x 10 Pixel Size, 5300 MHz Dynamic Range, 50 MHz Maximum Data Rate, 2 Outputs     | Yes          | Now          |
| TH7834C     | 12000 Pixels, 6.5 x 6.5 Pixel Size, 10000 MHz Dynamic Range, 20 MHz Maximum Data Rate, 4 Outputs | Yes          | Now          |
| TH7841A     | 2048 Pixels, 13 x 11 Pixel Size, 6000 MHz Dynamic Range, 20 MHz Maximum Data Rate, 2 Outputs     | No           | Now          |

**CCD Area Arrays: Frame Transfer Image Sensors**

| Part Number | TV Standard | Description   | Antiblooming | Availability |
|-------------|-------------|---|--------------|--------------|
| TH7868B     | CCIR        | 2/3" Image Format, 4:3 Image Ratio, 2 x 288 Lines, 768 Pixels per Line, 4500 MHz Dynamic Range, 15 MHz Maximum Data Rate, 2 Outputs | Yes          | Now          |
| TH7887A     | Progressive | 1:1 Image Ratio, 1024 Lines, 1024 Pixels per Line, 10000 MHz Dynamic Range, 20 MHz Maximum Data Rate, 4 Outputs                     | Yes          | Now          |
| TH7888A     | Progressive | 1:1 Image Ratio, 1024 Lines, 1024 Pixels per Line, 1000 MHz Dynamic Range, 20 MHz Maximum Data Rate, 1 or 2 Outputs                 | Yes          | Now          |
| TH7890M     | Progressive | 1:1 Image Ratio, 512 Pixels per Line, 7 MHz Maximum Data Rate, 1 Output, 12-bit Dynamic Range                                       | No           | Now          |
| TH7891M     | Progressive | 1:1 Image Ratio, 1024 Pixels per Line, 6 MHz Maximum Data Rate, 1 Output, 12-bit Dynamic Range                                      | No           | Now          |

**CCD Area Arrays: Full Frame Image Sensors**

| Part Number | Number of Pixels  | Availability |
|-------------|---|--------------|
| TH7899M     | 2048 x 2048 Pixels, 14 x 14 mm <sup>2</sup> Pixel Size, 8.5V $\mu\text{J}/\text{cm}^2$ , 4 x 20 MHz Maximum Data Rate | Now          |

**Broadband Data Converters**

| Part Number  | Description   | Evaluation Board | Availability |
|--------------|---|------------------|--------------|
| JTS8388B     | 8-bit Resolution, 1000 Msps Sampling Rate, 2000 MHz Input Bandwidth, 1 GSPS 8-bit A/D Converter Delivered in Die Form   | TSEV8388B        | Now          |
| TS8388BF     | 8-bit Resolution, 1000 Msps Sampling Rate, 1500 MHz Input Bandwidth, 1 GSPS 8-bit A/D Converter in 68-lead CQFP Package | TSEV8388BF       | Now          |
| TS8388BG     | 8-bit Resolution, 1000 Msps Sampling Rate, 1800 MHz Input Bandwidth, 1 GSPS A/D Converter in 72-ball CBGA Package       | TSEV8388BG       | Now          |
| TSX83102GOGL | 10-bit Resolution, 2 Gsps Sampling Rate, 3.4 GHz Input Bandwidth, 2 Gsps 10-bit A/D Converter in 148-ball CBGA Package  | TSXEV83102GOGL   | 2Q2002       |
| AT76C610     | 6-bit Resolution, 1 Gsps Sampling Rate, 250 MHz Input Bandwidth Dual-1 Gsps 6-bit A/D Converter in 80-lead TQFP Package | AT76C610-EB      | Now          |

**DMUX for Broadband ADC**

| Part Number | Description  | Evaluation Board | Availability |
|-------------|--|------------------|--------------|
| TS81102G0   | 8 to 10-bit Resolution, 2000 Msps Maximum Input Sampling Rate, 1:8/1:4 Speed Ratio, $\pm 5\text{V}$ Power Supply, 8 to 10-bit 2 GSPS 1:8/1:4 DEMUX | TSEV81102G0TP    | Now          |

## High-reliability Microprocessors

| Part Number   | Family      | Description   | Availability |
|---------------|-------------|---|--------------|
| EF4442        | ARINC       | ARINC 429 Multichannel Buffer Receiver (RTA), 28-pin DIL and 28-pin DIP Packages  | Now          |
| TS68C429A     | ARINC       | CMOS ARINC 429 Multichannel Receiver/Transmitter, 84-pin PGA and 132-lead CQFP Packages   | Now          |
| TS68020       | 32-bit CISC | HCMOS 32-bit Virtual Memory Microprocessors, 114-pin PGA and 132-lead CQFP Packages   | Now          |
| TS68040       | 32-bit CISC | Third-generation 32-bit Microprocessor, 179-pin PGA and 196-lead CQFP Packages  | Now          |
| TS68882       | 32-bit CISC | CMOS Enhanced Floating-point Coprocessor, 68-pin PGA and 68-lead CQFP Packages  | Now          |
| TSPC603R      | 32-bit RISC | PowerPC 603e RISC Microprocessor 166, 200 and 300 MHz, 255-ball CBGA, 255-ball CI-CBGA, 240-lead MQUAD Packages                                     | Now          |
| TSPC106A      | 32-bit RISC | PCI Bus Bridge/Memory Controller, 66 and 83 MHz, 303-ball CBGA and 303-ball CI-CBGA with Solder Column Interposer (SCI) Packages                    | Now          |
| PC107A        | 32-bit RISC | PCI Bridge/Memory Controller, 66, 83 and 100 MHz, 503-ball PBGA Package   | Now          |
| TSPC740A/750A | 32-bit RISC | RISC Microprocessor 200 and 266 MHz, 255-ball CBGA (for 740A) and 360-ball CBGA (for 750A) and CI-CBGA with Solder Column Interposer (SCI) Packages | Now          |
| PC745B/755B   | 32-bit RISC | RISC Microprocessor 300 and 400 MHz, 255-ball PBGA (for 745B) and 360-ball PBGA, 360-ball CBGA (for 755B) Packages                                  | Now          |
| TSPC7400      | 32-bit RISC | RISC Microprocessor with Alvitac 350 and 400, 360-ball CBGA, 350-ball CI-CBGA Packages  | Now          |
| PC7410        | 32-bit RISC | RISC Microprocessor with Alvitac 400, 450 MHz, 360-ball CBGA, 360-ball CI-CBGA Packages   | 4Q2001       |
| PC7450        | 32-bit RISC | RISC Microprocessor with Alvitac 500 MHz, 484-ball CBGA Package   | 4Q2001       |
| PC8240        | 32-bit RISC | Integrated Processor, 200 MHz, 352-ball TBGA Package  | Now          |
| PC8245        | 32-bit RISC | Integrated Processor, 300 MHz, 352-ball TBGA Package  | 2H2001       |

## High-reliability MCU and Clock Drivers

| Part Number | Family        | Description  | Availability |
|-------------|---------------|--|--------------|
| TS68302     | MCU           | Integrated Multiprotocol Processor (IMP), 132-pin PGA and 132-lead CQFP Packages                     | Now          |
| TS68332     | MCU           | High-performance 32-bit Integrated Microcontroller, 132-pin PGA and 132-lead CQFP Packages           | Now          |
| TS68EN360   | MCU           | 32-bit QUAD Integrated Communication Controller, 241-pin PGA and 240-lead CQFP Packages              | Now          |
| TSPC860SR   | MCU           | PowerQUICC Communication Controller 66 MHz, ATM Support, 357-ball PBGA Package                       | Now          |
| PC8260      | MCU           | PowerQUICC Integrated PowerPC Processor, 480-ball TBGA Package                                       | 4Q2001       |
| TS88915T    | Clock Drivers | Low Skew CMOS PLL Clock Driver 3-state 70 and 100 MHz Versions, 29-pin PGA and 28-lead LDCC Packages | Now          |
| TSPC932     | Clock Drivers | Low-voltage PLL Clock Driver, 32-lead TQFP Package   | Now          |

**DataFlash®**

| Part Number                               | Speed     | Density  | Description   | Availability      |
|---|-----------|----------|---|-------------------|
| <b>Battery-Voltage (2.7 to 3.6V)</b>      |           |          |   |                   |
| AT45DB011B                                | 20 MHz    | 1M-bit   | 2.7-volt Only Serial Interface Flash with One 264-byte SRAM Buffer      | Now               |
| AT45DB021B                                | 20 MHz    | 2M-bit   | 2.7-volt Only Serial Interface Flash with Two 264-byte SRAM Buffers     | Now               |
| AT45DB041B                                | 20 MHz    | 4M-bit   | 2.7-volt Only Serial Interface Flash with Two 264-byte SRAM Buffers     | Now               |
| AT45DB081B                                | 20 MHz    | 8M-bit   | 2.7-volt Only Serial Interface Flash with Two 264-byte SRAM Buffers     | Now               |
| AT45DB161B                                | 20 MHz    | 16M-bit  | 2.7-volt Only Serial Interface Flash with Two 528-byte SRAM Buffers     | Now               |
| AT45DB321B                                | 20 MHz    | 32M-bit  | 2.7-volt Only Serial Interface Flash with Two 528-byte SRAM Buffers     | Now               |
| AT45DB642                                 | 20/5 MHz  | 64M-bit  | 2.7-volt Only Dual-interface Flash with Two 1,056-byte SRAM Buffers     | Now               |
| AT45DB1282                                | 50/40 MHz | 128M-bit | 2.7-volt/1.8-volt Dual-interface Flash with Two 1,056-byte SRAM Buffers | Samples<br>1Q2002 |
| AT45DB2562                                | 50/40 MHz | 256M-bit | 2.7-volt/1.8-volt Dual-interface Flash with Two 2,112-byte SRAM Buffers | Samples<br>1Q2002 |
| <b>Low Battery Voltage (2.5V to 3.6V)</b> |           |          |   |                   |
| AT45DB041B-2.5                            | 15 MHz    | 4M-bit   | 2.5-volt Only Serial Interface Flash with Two 264-byte SRAM Buffers     | Now               |
| AT45DB081B-2.5                            | 15 MHz    | 8M-bit   | 2.5-volt Only Serial Interface Flash with Two 264-byte SRAM Buffers     | Now               |
| AT45DB161B-2.5                            | 15 MHz    | 16M-bit  | 2.5-volt Only Serial Interface Flash with Two 512-byte SRAM Buffers     | Now               |
| <b>DataFlash Cards</b>                    |           |          |   |                   |
| AT45DCB002                                | 20 MHz    | 2M-byte  | 2.7-volt Only Serial Interface DataFlash Card                           | Now               |
| AT45DCB004                                | 20 MHz    | 4M-byte  | 2.7-volt Only Serial Interface DataFlash Card                           | Now               |
| AT45DCB008                                | 20 MHz    | 8M-byte  | 2.7-volt Only Serial Interface DataFlash Card                           | Now               |

**Flash**

| Part Number  | Organization       | Speeds       | Description  | Availability |
|--|--------------------|--------------|--|--------------|
| <b>Battery-Voltage (2.7 to 3.6V Single-voltage Read and Write)</b> |                    |              |  |              |
| AT29BV010A   | 128K x 8           | 200 - 250 ns | 1M-bit, 2.7-volt Small Sectored Flash                  | Now          |
| AT29BV020  | 256K x 8           | 110 - 250 ns | 2M-bit, 2.7-volt Small Sectored Flash                  | Now          |
| AT29BV040A   | 512K x 8           | 250 ns       | 4M-bit, 2.7-volt Small Sectored Flash                  | Now          |
| AT49BV512  | 64K x 8            | 90 - 120 ns  | 512K-bit, 2.7-volt Boot Flash                          | Now          |
| AT49BV001(N)(T)  | 128K x 8           | 70 - 90 ns   | 1M-bit, 2.7-volt Parametric Flash (No Reset, Top Boot) | Now          |
| AT49BV002(N)(T)  | 256K x 8           | 90 - 120 ns  | 2M-bit, 2.7-volt Parametric Flash (No Reset, Top Boot) | Now          |
| AT49BV2048A  | 128K x 16/256K x 8 | 70 - 120 ns  | 2M-bit, 2.7-volt Parametric Flash                      | Now          |
| AT49BV040  | 512K x 8           | 70 - 90 ns   | 4M-bit, 2.7-volt Boot Flash                            | Now          |
| AT49BV4096A  | 256K x 16/512K x 8 | 70 - 120 ns  | 4M-bit, 2.7-volt Parametric Flash                      | Now          |
| AT49BV008A(T)  | 1M x 8             | 100 - 110 ns | 8M-bit, 2.7-volt Parametric Flash                      | Now          |
| AT49BV8192A(T)   | 512K x 16/1M x 8   | 100 - 110 ns | 8M-bit, 2.7-volt Parametric Flash (Top Boot)           | Now          |
| AT49BV8011(T)  | 512K x 16/1M x 8   | 110 ns       | 8M-bit, 2.7-volt Sectored/Concurrent Flash (Top Boot)  | Now          |
| AT49BV160(T)   | 1M x 16            | 70 - 90 ns   | 16M-bit, 3.0-volt Sectored Flash (Top Boot)            | Now          |
| AT49BV161(T)   | 1M x 16/2M x 8     | 70 - 90 ns   | 16M-bit, 3.0-volt Sectored Flash (Top Boot)            | Now          |
| AT49BV1604A(T)   | 1M x 16            | 70 - 90 ns   | 16M-bit, 2.7-volt Sectored/Concurrent Flash (Top Boot) | Now          |
| AT49BV1614A(T)   | 1M x 16/2M x 8     | 70 - 90 ns   | 16M-bit, 2.7-volt Sectored/Concurrent Flash (Top Boot) | Now          |
| AT49BV320(T)   | 2M x 16            | 85 - 110 ns  | 32M-bit, 2.7-volt Sectored (Top Boot)                  | Now          |
| AT49BV321(T)   | 2M x 16/4M x 8     | 85 - 110 ns  | 32M-bit, 2.7-volt Sectored (Top Boot)                  | Now          |
| AT49BV3218(T)  | 2M x 16/4M x 8     | 85 - 110 ns  | 32M-bit, 2.7-volt Sectored/Concurrent Flash (Top Boot) | Now          |

**Flash (Continued)**

| Part Number   | Organization       | Speeds       | Description  | Availability |
|---|--------------------|--------------|--|--------------|
| <b>Low-voltage (3.0 to 3.6V Single-voltage Read and Write)</b>      |                    |              |  |              |
| AT29LV256   | 32K x 8            | 150 - 250 ns | 256K-bit, 3.0-volt Small Sector Flash                  | Now          |
| AT29LV512   | 64K x 8            | 150 - 250 ns | 512K-bit, 3.0-volt Small Sector Flash                  | Now          |
| AT29LV010A  | 128K x 8           | 150 - 250 ns | 1M-bit, 3.0-volt Small Sector Flash                    | Now          |
| AT29LV1024  | 64K x 16           | 150 - 250 ns | 1M-bit, 3.0-volt Small Sector Flash                    | Now          |
| AT29LV020   | 256K x 8           | 100 - 250 ns | 2M-bit, 3.0-volt Small Sector Flash                    | Now          |
| AT29LV040A  | 512K x 8           | 200 - 250 ns | 4M-bit, 3.0-volt Small Sector Flash                    | Now          |
| AT49LV001(N)(T)   | 128K x 8           | 70 - 120 ns  | 1M-bit, 3.0-volt Parametric Flash (No Reset, Top Boot) | Now          |
| AT49LV002(N)(T)   | 256K x 8           | 70 - 120 ns  | 2M-bit, 3.0-volt Parametric Flash (No Reset, Top Boot) | Now          |
| AT49LV2048A   | 128K x 16/256 x 8  | 70 - 120 ns  | 2M-bit, 3.0-volt Parametric Flash                      | Now          |
| AT49LV040   | 512K x 8           | 70 - 120 ns  | 4M-bit, 3.0-volt Boot Flash                            | Now          |
| AT49LV4096A   | 256K x 16/512K x 8 | 70 - 120 ns  | 4M-bit, 3.0-volt Parametric Flash                      | Now          |
| AT49LV008A(T)   | 1M x 8             | 90 - 120 ns  | 8M-bit, 3.0-volt Flash (Top Boot)                      | Now          |
| AT49LV8192A(T)  | 512K x 16/1M x 8   | 90 - 120 ns  | 8M-bit, 3.0-volt Flash (Top Boot)                      | Now          |
| AT49LV161(T)  | 1M x 16/2M x 8     | 70 ns        | 16M-bit, 3.0-volt Sector Flash (Top Boot)              | Now          |
| AT49LV1614A(T)  | 1M x 16/2M x 8     | 70 ns        | 16M-bit, 3.0-volt Sector/Concurrent Flash (Top Boot)   | Now          |
| AT49LV320(T)  | 2M x 16            | 90 ns        | 32M-bit, 3.0-volt Sector (Top Boot)                    | Now          |
| AT49LV321(T)  | 2M x 16/4M x 8     | 90 ns        | 32M-bit, 3.0-volt Sector (Top Boot)                    | Now          |
| <b>Standard Voltage (4.5 to 5.5V Single-voltage Read and Write)</b> |                    |              |  |              |
| AT29C256  | 32K x 8            | 70 - 120 ns  | 256K-bit, 5.0-volt Small Sector Flash                  | Now          |
| AT29C257  | 32K x 8            | 70 - 120 ns  | 256K-bit, 5.0-volt Small Sector Flash                  | Now          |
| AT29C512  | 64K x 8            | 70 - 120 ns  | 512K-bit, 5.0-volt Small Sector Flash                  | Now          |
| AT29C010A   | 128K x 8           | 70 - 120 ns  | 1M-bit, 5.0-volt Small Sector Flash                    | Now          |
| AT29C1024   | 64K x 16           | 70 - 120 ns  | 1M-bit, 5.0-volt Small Sector Flash                    | Now          |
| AT29C020  | 256K x 8           | 90 - 120 ns  | 2M-bit, 5.0-volt Small Sector Flash                    | Now          |
| AT29C040A   | 512K x 8           | 70 - 150 ns  | 4M-bit, 5.0-volt Small Sector Flash                    | Now          |
| AT49F512  | 64K x 8            | 55 - 90 ns   | 512K-bit, 5.0-volt Boot Flash                          | Now          |
| AT49F001(N)(T)  | 128K x 8           | 55 - 90 ns   | 1M-bit, 5.0-volt Parametric Flash (No Reset, Top Boot) | Now          |
| AT49F1024   | 64K x 16           | 45 - 70 ns   | 1M-bit, 5.0-volt Boot Flash                            | Now          |
| AT49F1025   | 64K x 16           | 45 - 70 ns   | 1M-bit, 5.0-volt Boot Flash                            | Now          |
| AT49F002(N)(T)  | 256K x 8           | 55 - 90 ns   | 2M-bit, 5.0-volt Parametric Flash (No Reset, Top Boot) | Now          |
| AT49F2048A  | 128K x 16/256K x 8 | 70 - 40 ns   | 2M-bit, 5.0-volt Parametric Flash                      | Now          |
| AT49F040  | 512K x 8           | 55 - 90 ns   | 4M-bit, 5.0-volt Boot Flash (Top Boot)                 | Now          |
| AT49F4096A  | 256K x 16/512K x 8 | 70 - 90 ns   | 4M-bit, 5.0-volt Parametric Flash                      | Now          |
| AT49F008A(T)  | 1M x 8             | 90 - 120 ns  | 8M-bit, 5.0-volt Boot Flash (Top Boot)                 | Now          |
| AT49F8192A(T)   | 512K x 16/1M x 8   | 90 - 120 ns  | 8M-bit, 5.0-volt Flash (Top Boot)                      | Now          |
| AT49F8011(T)  | 512K x 16/1M x 8   | 90 - 120 ns  | 8M-bit, 5.0-volt Sector/Concurrent Flash (Top Boot)    | Now          |

**Serial EEPROMs**

| Part Number | Organization           | V <sub>CC</sub> | Description   | Availability |
|-------------|------------------------|-----------------|---|--------------|
| AT24C01     | 128 x 8                | 1.8, 2.7V       | 1K-bit, 2-wire Bus Serial EEPROM, Non-Cascadable                                    | Now          |
| AT24C21     | 128 x 8                | 2.5V            | 1K-bit, 2-wire Bus Serial EEPROM, Dual-mode, Plug and Play Operation                | Now          |
| AT24C01A    | 128 x 8                | 1.8, 2.7V       | 1K-bit, 2-wire Bus Serial EEPROM, Full Array Write Protect                          | Now          |
| AT24C02     | 256 x 8                | 1.8, 2.7V       | 2K-bit, 2-wire Bus Serial EEPROM, Full Array Write Protect                          | Now          |
| AT24C02A    | 256 x 8                | 1.8, 2.7V       | 2K-bit, 2-wire Bus Serial EEPROM, Half Array Write Protect                          | Now          |
| AT34C02     | 256 x 8                | 1.8, 2.7V       | 2K-bit, 2-wire Serial EEPROM, Software Write Protect                                | Now          |
| AT24C04     | 512 x 8                | 1.8, 2.7V       | 4K-bit, 2-wire Bus Serial EEPROM, Full Array Write Protect                          | Now          |
| AT24C04A    | 512 x 8                | 1.8, 2.7V       | 4K-bit, 2-wire Bus Serial EEPROM, Half Array Write Protect                          | Now          |
| AT24C08     | 1K x 8                 | 1.8, 2.7V       | 8K-bit, 2-wire Bus Serial EEPROM  | Now          |
| AT24C08A    | 1K x 8                 | 1.8, 2.7V       | 8K-bit, 2-wire Bus Serial EEPROM, Full Array Write Protect                          | Now          |
| AT24C16     | 2K x 8                 | 1.8, 2.7V       | 16K-bit, 2-wire Bus Serial EEPROM, Half Array Write Protect                         | Now          |
| AT24C16A    | 2K x 8                 | 1.8, 2.7V       | 16K-bit, 2-wire Bus Serial EEPROM, Full Array Write Protect                         | Now          |
| AT24C164    | 2K x 8                 | 1.8, 2.7V       | 16K-bit, 2-wire Bus Serial EEPROM, Cascadable                                       | Now          |
| AT24C32     | 4K x 8                 | 1.8, 2.7V       | 32K-bit, 2-wire Bus Serial EEPROM, Cascadable and 1/4 Array Write Protect           | Now          |
| AT24C32A    | 4K x 8                 | 1.8, 2.7V       | 32K-bit, 2-wire Bus Serial EEPROM, Cascadable and Full Array Write Protect          | Now          |
| AT24C64     | 8K x 8                 | 1.8, 2.7V       | 64K-bit, 2-wire Bus Serial EEPROM, Cascadable and 1/4 Array Write Protect           | Now          |
| AT24C64A    | 8K x 8                 | 1.8, 2.7V       | 64K-bit, 2-wire Bus Serial EEPROM, Cascadable and Full Array Write Protect          | Now          |
| AT24C128    | 16K x 8                | 1.8, 2.7V       | 128K-bit, 2-wire Bus Serial EEPROM, Cascadable                                      | Now          |
| AT24CS128   | 16K x 8                | 1.8, 2.7V       | 128K-bit, 2-wire Bus Serial EEPROM, Cascadable and Permanent Software Write Protect | Now          |
| AT24C256    | 32K x 8                | 1.8, 2.7V       | 256K-bit, 2-wire Bus Serial EEPROM, Cascadable                                      | Now          |
| AT24C512    | 64K x 8                | 1.8, 2.7V       | 512K-bit, 2-wire Bus Serial EEPROM, Cascadable and Full Array Write Protect         | Now          |
| AT24C1024   | 128K x 8               | 1.8, 2.7V       | 1M-bit, 2-wire Serial EEPROM, Cascadable and Full Array Write Protect               | Now          |
| AT25010     | 128 x 8                | 2.7V            | 1K-bit, SPI Bus Serial EEPROM, SPI Mode 0 and 3                                     | Now          |
| AT25020     | 256 x 8                | 2.7V            | 2K-bit, SPI Bus Serial EEPROM, SPI Mode 0 and 3                                     | Now          |
| AT25040     | 512 x 8                | 2.7V            | 4K-bit, SPI Bus Serial EEPROM, SPI Mode 0 and 3                                     | Now          |
| AT25080     | 1K x 8                 | 1.8, 2.7V       | 8K-bit, SPI Bus Serial EEPROM, SPI Mode 0 and 3                                     | Now          |
| AT25160     | 2K x 8                 | 1.8, 2.7V       | 16K-bit, SPI Bus Serial EEPROM, SPI Mode 0 and 3                                    | Now          |
| AT25320     | 4K x 8                 | 2.7V            | 32K-bit, SPI Bus Serial EEPROM, SPI Mode 0 and 3                                    | Now          |
| AT25640     | 8K x 8                 | 1.8, 2.7V       | 64K-bit, SPI Bus Serial EEPROM, SPI Mode 0 and 3                                    | Now          |
| AT25128     | 16K x 8                | 1.8, 2.7V       | 128K-bit, SPI Bus Serial EEPROM, SPI Mode 0 and 3                                   | Now          |
| AT25256     | 32K x 8                | 1.8, 2.7V       | 256K-bit, SPI Bus Serial EEPROM, SPI Mode 0 and 3                                   | Now          |
| AT25HP256   | 32K x 8                | 1.8, 2.7V       | 256K-bit, SPI Bus Serial EEPROM, High-speed, Page-write Only, SPI Mode 0 and 3      | Now          |
| AT25HP512   | 64K x 8                | 1.8, 2.7V       | 512K-bit, SPI Bus Serial EEPROM, High-speed, Page-write Only, SPI Mode 0 and 3      | Now          |
| AT25P1024   | 128K x 8               | 2.7V            | 1M-bit, SPI Bus Serial EEPROM, Page-write Only, SPI Mode 0 and 3                    | Now          |
| AT25F1024   | 128K x 8               | 2.7 - 3.6V      | 1M-bit, SPI Bus Serial Flash, High-speed, SPI Mode 0 and 3                          | Now          |
| AT93C46     | 64 x 16/<br>128 x 8    | 1.8, 2.7V       | 1K-bit, 3-wire Bus Serial EEPROM  | Now          |
| AT93C46A    | 64 x 16                | 2.5, 2.7V       | 1K-bit, 3-wire Bus Serial EEPROM  | Now          |
| AT93C46C    | 64 x 16                | 2.5, 2.7V       | 1K-bit, 3-wire Bus Serial EEPROM, Schmitt Trigger Inputs                            | Now          |
| AT93C56     | 128 x 16/<br>256 x 8   | 2.5, 2.7V       | 2K-bit, 3-wire Bus Serial EEPROM  | Now          |
| AT93C66     | 256 x 16/<br>512 x 8   | 1.8, 2.7V       | 4K-bit, 3-wire Bus Serial EEPROM  | Now          |
| AT93C86     | 1024 x 16/<br>2048 x 8 | 2.7V            | 16K-bit, 3-wire Bus Serial EEPROM, Sequential Read and Schmitt Trigger Inputs       | Now          |



**Parallel EEPROMs**

| Part Number                               | Organization | Speeds        | Description   | Availability |
|---|--------------|---------------|---|--------------|
| <b>High-speed</b>                         |              |               |   |              |
| AT28HC64B                                 | 8K x 8       | 70 - 120 ns   | 64K-bit EEPROM with 64-byte Page and Software Data Protection   | Now          |
| AT28HC256                                 | 32K x 8      | 70 - 120 ns   | 256K-bit EEPROM with 64-byte Page and Software Data Protection, Commercial/Industrial/Military                    | Now          |
| AT28HC256E                                | 32K x 8      | 70 - 120 ns   | 256K-bit EEPROM with Extended Endurance, Commercial/Industrial/Military   | Now          |
| AT28HC256F                                | 32K x 8      | 70 - 120 ns   | 256K-bit EEPROM with Fast Write, Commercial/Industrial/Military   | Now          |
| <b>Battery-Voltage (2.7 to 3.6V)</b>      |              |               |   |              |
| AT28LV010                                 | 128K x 8     | 200 - 250 ns  | 1M-bit EEPROM with 128-byte Page and Software Data Protection, 3.0-volt   | Now          |
| AT28BV64B                                 | 8K x 8       | 200 - 250 ns  | 64K-bit EEPROM with 64-byte Page and Software Data Protection, 2.7-volt   | Now          |
| AT28BV256                                 | 32K x 8      | 200 - 250 ns  | 256K-bit EEPROM with 64-byte Page and Software Data Protection, 2.7-volt  | Now          |
| <b>Standard Voltage (5.0V)</b>            |              |               |   |              |
| AT28C16                                   | 2K x 8       | 150 ns        | 16K-bit EEPROM  | Now          |
| AT28C16E                                  | 2K x 8       | 150 ns        | 16K-bit EEPROM with Extended Endurance and Fast Write   | Now          |
| AT28C17                                   | 2K x 8       | 150 ns        | 16K-bit EEPROM with Ready/Busy  | Now          |
| AT28C17E                                  | 2K x 8       | 150 ns        | 16K-bit EEPROM with Ready/Busy and Extended Endurance and Fast Write  | Now          |
| AT28C64                                   | 8K x 8       | 120 - 250 ns  | 64K-bit EEPROM (Use AT28C64B for New Designs)   | Now          |
| AT28C64E                                  | 8K x 8       | 120 - 250 ns  | 64K-bit EEPROM with Extended Endurance and Fast Write (Use AT28C64B for New Designs)                              | Now          |
| AT28C64X                                  | 8K x 8       | 120 - 250 ns  | 64K-bit EEPROM without Ready/Busy (Use AT28C64B for New Designs)  | Now          |
| AT28C64B                                  | 8K x 8       | 150 - 250 ns  | 64K-bit EEPROM with 64-byte Page and Software Data Protection   | Now          |
| AT28C256                                  | 32K x 8      | 150 - 250 ns  | 256K-bit EEPROM with 64-byte Page and Software Data Protection, Commercial/Industrial/Military                    | Now          |
| AT28C256E                                 | 32K x 8      | 150 - 250 ns  | 256K-bit EEPROM with Extended Endurance, Commercial/Industrial/Military   | Now          |
| AT28C256F                                 | 32K x 8      | 150 - 250 ns  | 256K-bit EEPROM with Fast Write, Commercial/Industrial/Military   | Now          |
| AT28C010                                  | 128K x 8     | 120 - 250 ns  | 1M-bit EEPROM with 128-byte Page and Software Data Protection, Commercial/Industrial/Military                     | Now          |
| AT28C010E                                 | 128K x 8     | 120 - 250 ns  | 1M-bit EEPROM with 128-byte Page, Extended Endurance and Software Data Protection, Commercial/Industrial/Military | Now          |
| AT28C040                                  | 512K x 8     | 200 - 250 ns  | 4M-bit EEPROM with 256-byte Page and Software Data Protection   | Now          |
| <b>Standard Military Drawing Products</b> |              |               |   |              |
| 5962-88525                                | 32K x 8      | Reference SMD | Reference SMD   | Now          |
| 5962-88634                                | 32K x 8      | Reference SMD | Reference SMD   | Now          |
| 5962-38267                                | 128K x 8     | Reference SMD | Reference SMD   | Now          |

**Parallel EEPROM Die Product\***

| Part Number   | V <sub>CC</sub> | Device T <sub>AA</sub> | Package Configuration |
|---------------|-----------------|------------------------|-----------------------|
| AT28BV64B-W   | 2.7 - 3.6V      | 250 ns                 | Die                   |
| AT28BV64B-DWF | 2.7 - 3.6V      | 250 ns                 | Wafer                 |
| AT28BV256-W   | 2.7 - 3.6V      | 250 ns                 | Die                   |
| AT28BV256-DWF | 2.7 - 3.6V      | 250 ns                 | Wafer                 |
| AT28LV010-W   | 3.0 - 3.6V      | 250 ns                 | Die                   |
| AT28LV010-DWF | 3.0 - 3.6V      | 250 ns                 | Wafer                 |
| AT28C64B-W    | 4.5 - 5.5V      | 200 ns                 | Die                   |
| AT28C64B-DWF  | 4.5 - 5.5V      | 200 ns                 | Wafer                 |
| AT28HC64B-W   | 4.5 - 5.5V      | 120 ns                 | Die                   |
| AT28HC64B-DWF | 4.5 - 5.5V      | 120 ns                 | Wafer                 |
| AT28C256-W    | 4.5 - 5.5V      | 200 ns                 | Die                   |
| AT28C256-DWF  | 4.5 - 5.5V      | 200 ns                 | Wafer                 |
| AT28HC256-W   | 4.5 - 5.5V      | 120 ns                 | Die                   |
| AT28HC256-DWF | 4.5 - 5.5V      | 120 ns                 | Wafer                 |
| AT28C010-W    | 4.5 - 5.5V      | 200 ns                 | Die                   |
| AT28C010-DWF  | 4.5 - 5.5V      | 200 ns                 | Wafer                 |

\*Performance is guaranteed over commercial temperature range as standard product.

**EPROMs**

| Part Number                               | Organization | Speeds       | Description                                   | Availability |
|---|--------------|--------------|---|--------------|
| <b>Battery-Voltage™ (2.7 to 3.6V)</b>     |              |              |   |              |
| AT27BV256                                 | 32K x 8      | 70 - 150 ns  | 256K-bit, 2.7-volt to 3.6-volt EPROM          | Now          |
| AT27BV512                                 | 64K x 8      | 70 - 150 ns  | 512K-bit, 2.7-volt to 3.6-volt EPROM          | Now          |
| AT27BV010                                 | 128K x 8     | 90 - 150 ns  | 1M-bit, 2.7-volt to 3.6-volt EPROM            | Now          |
| AT27BV1024                                | 64K x 16     | 90 - 150 ns  | 1M-bit, 2.7-volt to 3.6-volt EPROM            | Now          |
| AT27BV020                                 | 256K x 8     | 90 - 150 ns  | 2M-bit, 2.7-volt to 3.6-volt EPROM            | Now          |
| AT27BV040                                 | 512K x 8     | 120 - 150 ns | 4M-bit, 2.7-volt to 3.6-volt EPROM            | Now          |
| AT27BV4096                                | 256K x 16    | 120 - 150 ns | 4M-bit, 2.7-volt to 3.6-volt EPROM            | Now          |
| <b>Low-voltage (3.0 to 3.6V)</b>          |              |              |   |              |
| AT27LV256A                                | 32K x 8      | 55 - 150 ns  | 256K-bit, 3.0-volt EPROM                      | Now          |
| AT27LV512A                                | 64K x 8      | 70 - 150 ns  | 512K-bit, 3.0-volt EPROM                      | Now          |
| AT27LV520                                 | 64K x 8      | 70 - 90 ns   | 512K-bit, Latched 3.0-volt EPROM              | Now          |
| AT27LV010A                                | 128K x 8     | 70 - 150 ns  | 1M-bit, 3.0-volt EPROM                        | Now          |
| AT27LV020A                                | 256K x 8     | 90 - 150 ns  | 2M-bit, 3.0-volt EPROM                        | Now          |
| AT27LV040A                                | 512K x 8     | 90 - 150 ns  | 4M-bit, 3.0-volt EPROM                        | Now          |
| <b>Standard Voltage (5.0V)</b>            |              |              |   |              |
| AT27C256R                                 | 32K x 8      | 45 - 150 ns  | 256K-bit, 5.0-volt EPROM                      | Now          |
| AT27C512R                                 | 64K x 8      | 45 - 150 ns  | 512K-bit, 5.0-volt EPROM                      | Now          |
| AT27C516                                  | 32K x 16     | 45 - 100 ns  | 512K-bit, 5.0-volt EPROM                      | Now          |
| AT27C010(L)                               | 128K x 8     | 45 - 150 ns  | 1M-bit, 5.0-volt EPROM Standard and Low-power | Now          |
| AT27C1024                                 | 64K x 16     | 45 - 150 ns  | 1M-bit, 5.0-volt EPROM                        | Now          |
| AT27C020                                  | 256K x 8     | 55 - 150 ns  | 2M-bit, 5.0-volt EPROM                        | Now          |
| AT27C2048                                 | 128K x 16    | 55 - 150 ns  | 2M-bit, 5.0-volt EPROM                        | Now          |
| AT27C040                                  | 512K x 8     | 70 - 150 ns  | 4M-bit, 5.0-volt EPROM                        | Now          |
| AT27C4096                                 | 256K x 16    | 55 - 150 ns  | 4M-bit, 5.0-volt EPROM                        | Now          |
| AT27C080                                  | 1M x 8       | 90 - 150 ns  | 8M-bit, 5.0-volt EPROM                        | Now          |
| <b>Automotive Grade (-40°C to +125°C)</b> |              |              |   |              |
| AT27C256R                                 | 32K x 8      | 70 - 150 ns  | 256K-bit, 5.0-volt EPROM                      | Now          |
| AT27C512R                                 | 64K x 8      | 70 - 150 ns  | 512K-bit, 5.0-volt EPROM                      | Now          |
| AT27C010                                  | 128K x 8     | 90 - 150 ns  | 1M-bit, 5.0-volt EPROM                        | Now          |
| AT27C1024                                 | 64K x 16     | 90 - 150 ns  | 1M-bit, 5.0-volt EPROM                        | Now          |
| AT27C020                                  | 256K x 8     | 90 - 150 ns  | 2M-bit, 5.0-volt EPROM                        | Now          |



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