8-bit Microcontrollers with Integrated USB Controller

Ready to Go in No Time

Atmel®'s family of 8-bit microcontrollers supports a wide range of USB applications: high-end keyboards, mice, phone accessories, toys, serial adapters and industrial equipment.
An on-chip bootloader permits very quick firmware download from a PC, without using a parallel programmer or dedicated hardware.
Nonvolatile memory stores configuration parameters enabling the system to be instantly operational, even without connection to a PC.
8051 solutions offer 8KB to 64KB of Flash with up to 4 MIPS and USB function. They also include 5 ROM variants for cost reduction when code is fixed.
AVR® solutions offer 8KB to 128KB of Flash with up to 16 MIPS, USB function and On-The-Go for dual role host or function.

Applications

- Keyboard and mice
- Gamepads and Joysticks
- Phone accessories
- Toys
- Serial adapters
- Industrial equipment
- Security Keys
- POS Terminals
- NFC and RFID readers
- Power supplies and chargers

Key Features & Benefits

- Popular and powerfull 8-bit architectures 8051 and AVR
- Extensive Library of USB reference firmware
- USB Certification
- Flash In-System Programming
- Factory Programmed USB boot-loader
- Choice of serial interfaces and analog peripherals
- Large range of memory sizes
- Industrial Grade and Quality
- Low power consumption

CERTIFIED USB

CERTIFIED USB On-The-Go

ATMEL®

USB Everywhere

After conquering computers and peripherals, USB is gaining momentum in consumer products and industrial equipment. Data storage, data transfer and product configuration are key applications driving this move.

On-The-Go (OTG) now allows devices to communicate without PC intervention. With the suitable device class libraries OTG can:

- support various targeted products
- negotiate host or device role with another OTG device
- connect to any PC as a USB device

Human Interface Devices form by far the most popular class of USB peripherals. New pointing and input devices gain in accuracy with full-speed (12 Mbit/s), which is provided by all Atmel USB microcontrollers. Atmel USB microcontrollers also support isochronous transfers and double buffering for audio streaming. Last but not least, Atmel controllers with seven endpoints can merge several USB functions in one composite device, thus saving space and components.

USB Self-Programming

Atmel USB Flash microcontrollers' on-chip bootloader can be used for self-programming at any step of the product life cycle: development, production, after sales support and in day to day use by the end user. Dedicated on-chip hardware secures the user firmware but can also force the application to reprogram when it has lost control.

Instant connection: programming on demand

USB Software Library

A library of reference firmware demonstrates the most popular USB device classes and helps proliferate applications without the need for custom driver development: Human Interface Device class for mice, keyboards and industrial equipment I/Os; Mass storage device class to share files with PCs; Communication Device Class for data transfer and UART emulation.

Device Class	Endpoint / Pipe*	AVR		8051
		Host (KB)	Function (KB)	Function (KB)
Device Firmware Update	1	7	4	3
Human Interface Device	1-3	4	3	3
Mass Storage	3	7	5	6
Communication Device Class	4	8	7	5
Audio	2	3	2.5	
Fingerchip Bulk	2			4

*Including one IN/OUT control endpoint/pipe

AVR Tools

Evaluation Kit	Atmel: AT90USBKEY, EVK525 Mass Storage Evaluation Kit
Starter Kit	Atmel: STK525, STK526
Emulator Platform	Atmel: JTAGICE mkII
In-System Programming	Atmel: FLIP software, AVRISP mkII, JTAGICE mkII, AVR Dragon
Flash Device Programmers	Atmel: STK500 with STK501 or STK526
Compilers	CodeVision™, GCC-AVR, IAR®,

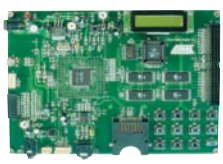
USB Demo Kit
P/N: AT90USBKEY

64 & 128KB Flash Starter Kit
P/N: ATSTK525

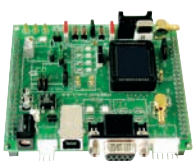
8 & 16KB Flash Starter Kit
P/N: ATSTK526

8051 Tools

Starter et Development Kits	Atmel: AT89STK-05, AT89STK-10, AT89DVK-04
Emulator	Ceibo, Hitex, Nohau, Phytec, Signum
In-System programming	Atmel: FLIP software
Flash Device Programmers	Ad vantech®, Hi-Lo Systems, Elnec, BP Microsystems, Data I/O®, etc
Compilers	Crossware®, Hi-Tech, IAR®, Keil™, Raisonnace® , SDCC, Tasking®



AT89C5132 Development Kit
P/N: AT89DVK-04



AT89C5130A/31A Starter Kit
P/N: AT89STK-05

Mass Storage
Starter Kit - P/N: AT89STK-10

USB 8-bit Microcontrollers Offering

	AT90USB82	AT90USB162	AT90USB646	AT90USB647	AT90USB1286	AT90USB1287	AT89C5130A	AT89C5131A	AT83C5134	AT89C5132	AT83C5135	AT83C5136	AT83EC5136	AT83C5136	AT83EI5136
Status a)	I	P	P	P	P	P	P	P	I	P	I	I	I	I	I
Flash (KB)	8	16	64	64	128	128	16	32		64	16		32		32
ROM (KB)									8			32		32	
ISP & Self Programming	USB/SPI	USB/SPI	USB/SPI	USB/SPI	USB/SPI	USB/SPI	USB	USB		USB					
EEPROM (Bytes)	512	512	2K	2K	4K	4K	1K	1K					512		32K
RAM (Bytes)	512	512	4K	4K	8K	8K	1280	1280	1280	2304	1280	1280	1280	1280	1280
I/O Pins	22	22	48	48	48	48	18/34	18/34	18	44	18	18/34	34	18/34	34
UART/USART	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SPI	1	1	1	1	1	1	Y	Y	Y	Y	Y	Y	Y	Y	Y
TWI (I2C compliant)				1	1	1	Y	Y	Y		Y	Y	Y	Y	Y
USB 2.0 Host/OTG				Y		Y									
USB Full Speed	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
USB Low Speed			Y	Y	Y	Y									
USB DPRAM (bytes)	176	176	832	832	832	832	1356	1356	356	168	356	356	356	356	356
USB Endpoints	5	5	7	7	7	7	7	7	6	4	6	6	6	6	6
PS2	Y	Y								Y					
I2S															
8-bit Timers	1	1	2	2	2	2	3+PCA	3+PCA	3+PCA	2	3+PCA	3+PCA	3+PCA	3+PCA	3+PCA
16-bit Timers	1	1	2	2	2	2	5	5	5	2	5	5	5	5	5
PWM (channel)	3+1	3+1	6+2	6+2	6+2	6+2									
Comparator	Y	Y	Y	Y	Y	Y									
A/D Converter (channel)			8	8	8	8				2					
Analog Gain Stage			Y	Y	Y	Y									
POR	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PFD	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Memory Interfaces (IDE, MMC, SD, CF, SM)										Y					
JTAG/DebugWIRE	D	D	J	J	J	J	Y				Y				
Vcc (V)	2.7 - 5.5	2.7 - 5.5	2.7 - 5.5	2.7 - 5.5	2.7 - 5.5	2.7 - 5.5	2.7 - 5.5	2.7 - 5.5	2.7 - 3.6	2.7 - 3.6	2.7 - 3.6	2.7 - 3.6	2.7 - 3.6	2.7 - 3.6	2.7 - 3.6
Max. Frequency (MHz)	8-16	8-16	8-16	8-16	8-16	8-16	48	48	32	20	32	32	32	32	32
Max. Speed (MIPS)	8-16	8-16	8-16	8-16	8-16	8-16	4	4	4	3.3	4	4	4	4	4
Packages	QFN32	TQFP32, QFN32	QFN64	TQFP64, QFN64	QFN64	TQFP64, QFN64	PLCC52, QFN32, VQFP64	PLCC52, QFN32 VQFP64, SO28	QFN32	VQFP80, Die	QFN32	QFN32, VQFP64 SO28, Die	QFN48	QFN32, VQFP64 SO28, Die	QFN48
Temperature Range	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C

a) I: Device under Introduction, P: Product in Full Production. Please contact your local sales for details.
CF: CompactFlash, **IDE:** Integrated Drive Electronics, **MMC:** MultiMedia Card, **PFD:** Power Fail Detect, **POR:** Power On Reset, **PWM:** Pulse Width Modulation, **SD:** Secure Digital, **SM:** Smart Media, **SPI:** Serial Peripheral Interface, **USB:** Universal Serial Bus.

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