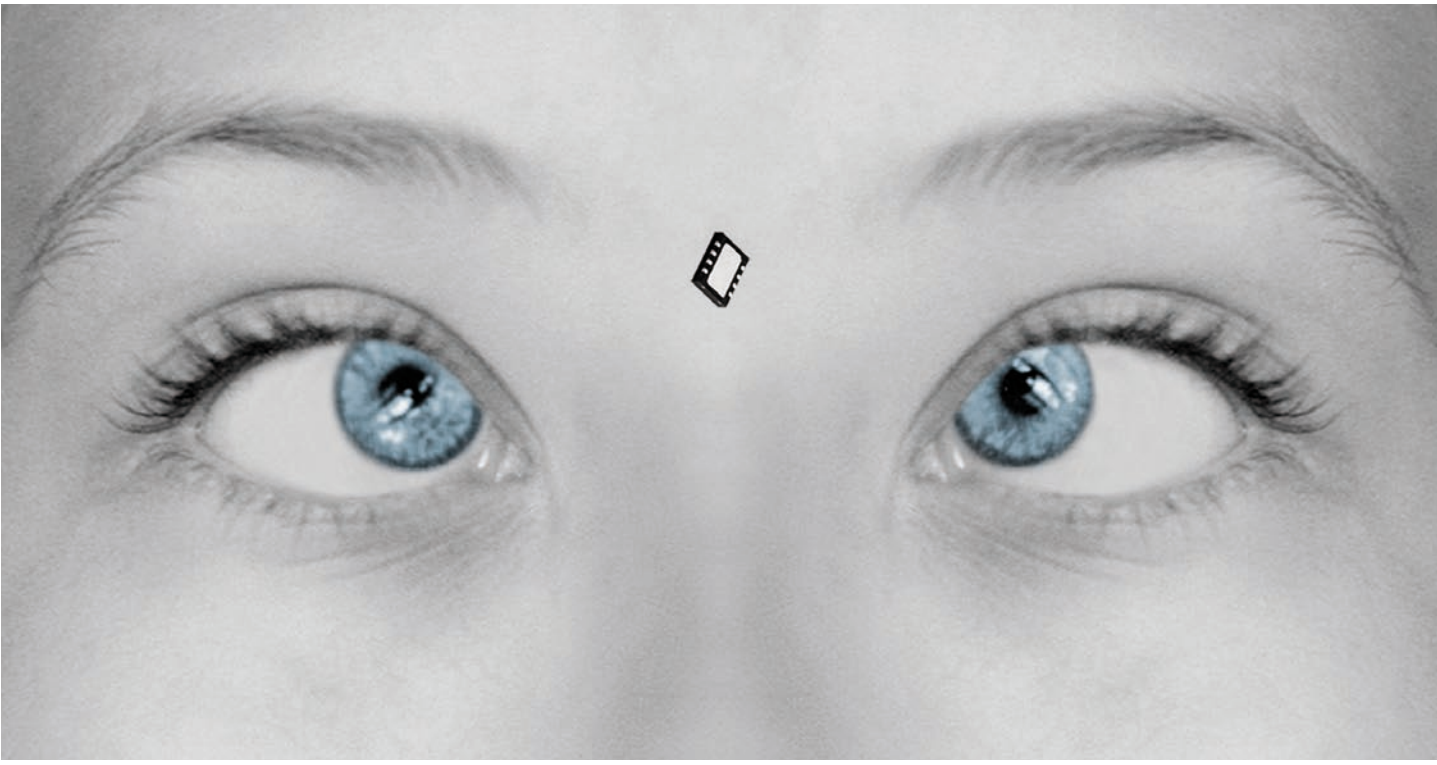
ST7Lite family

Small-scale, user-friendly microcontrollers optimized for demanding applications



February 2008

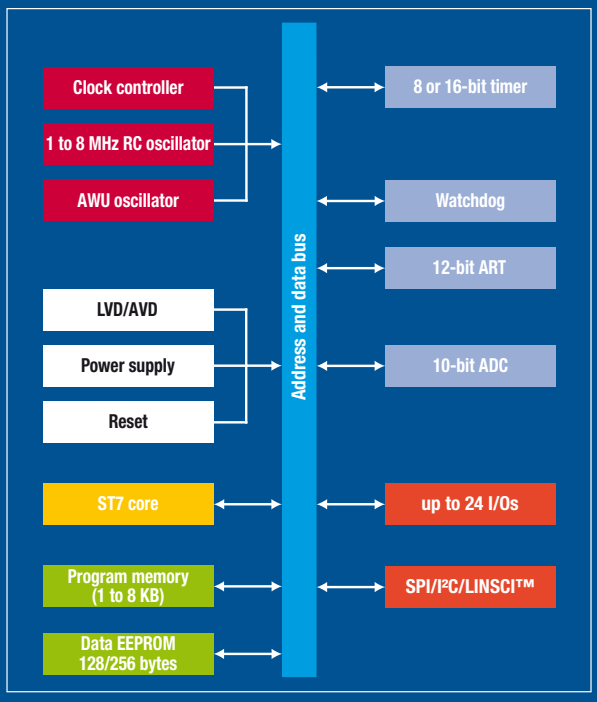
www.st.com/mcu

STMicroelectronics' ST7Lite series consists of low memory size and general-purpose 8-bit Flash microcontroller devices ideal for cost-sensitive applications. It provides outstanding flexibility at every stage of the product cycle, from first prototype to production logistics, ensuring reduced cost of ownership and fast time-to-market.
All MCUs use the same single-voltage Flash technology and are programmed using the same techniques and tools.

Applications

- Lighting
- Alarms
- Home appliances
- Sensors
- Air-conditioning
- Computers
- Metering
- Touch control
- Motor control
- Peripheral expanders
- DC/DC converters
- Toys
- Power tools
- Consumer products

ST7UltraLite Primer – complete, low-cost mini application



Cost-effective 8-bit microcontroller with more on-chip functions

In addition to small footprints and I/O optimized pin counts, ST7Lite developers benefit from a range of common peripherals and advanced features that make applications smaller and easier to design, including:

- Highly-accurate internal RC oscillator
- Real independent data EEPROM
- Single voltage Flash memory technology for inexpensive in-application programming solutions and firmware upgrade
- Fast A/D converter (3.5 µs conversion time @ 8 MHz f_{CPU}) including operational amplifier for zooming
- Fast and flexible timers for PWM generation, output compare and input capture, dead-time management, break
- Full range of development tools including free ANSI C compiler and affordable starter kits, debuggers and programmers
- Advanced analog functions with operational amplifiers, comparator, and internal voltage references

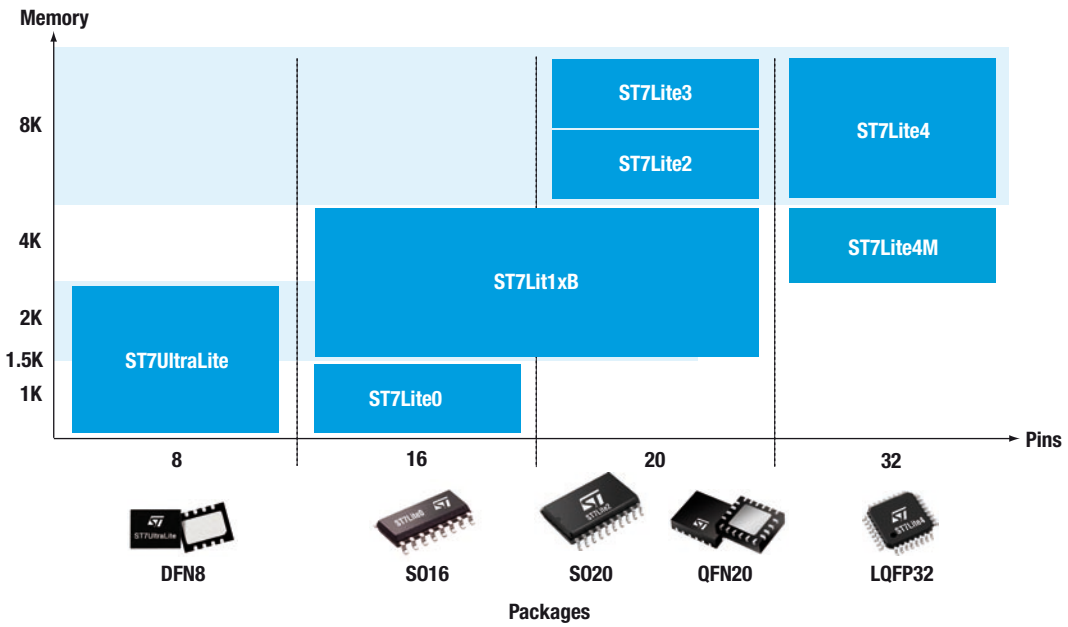
ST7Lite family

Features and benefits

Features	Benefits
The UltraLite DFN8 package is only 0.9 mm high and less than 16 mm^2	Small 8-pin footprint up to 32 pins
Up to -40 to 125 °C, 2.4 to 5.5 V	Satisfies the most demanding system requirements
Multiple internal clock sources. Smart clock management: switching on-the-fly between internal and external clock sources. Accurate internal RC oscillator	No external clock required, cost reduced and pins saved for I/Os. Clock divider and PLL, in order to adjust the CPU frequency
Up to 10 channels, 10-bit A/D converter with 3.5 µs conversion time	Fast and highly accurate A/D converter, with zooming function
8-bit timer with watchdog, real-time base, input capture, 12-bit timer with output compare, PWM and 16-bit timer	Full timer set on board
Ideal I/O optimization versus pin count with a large package selection	Six I/Os available in 8-pin package
Low voltage detector and auxiliary voltage detector	A smart system to prevent out-of-range power supply working modes
Five power-saving modes	Allows system flexibility and low power consumption
Several communication peripherals	UART, SPI, I^2C, DALI
Analog comparators with internal or external references	Internal connection to the 12-bit timer with break control capability, ideal for “emergency logic” implementation.

ST7Lite family product range

The Lite family: a complete portforlio in the low pin count range



Device summary

	Part number	Program memory type: Flash	Program memory type: ROM	Prog. (Kbytes)	RAM (bytes)	Data E²PROM (bytes)	A/D inputs	Timer functions: 12 or 16-bit (IC/OC/PWM)	Timer functions: 8-bit (IC/OC/PWM)	Timer functions: Others	Serial interface	LVD levels	I/Os (high current[1])	Packages	Supply voltage	Special features
8 pins	**ST7LITEU05**	●[2,3]		2	128		5x10-bit	1x12-bit (0/1/1)	1(1/0/0)	WDG, RTC		3	5(5)	DIP8/SO8/DFN8	2.4 to 5.5 V	8 MHz internal RC oscillator, AWU, ROP, ICP, IAP, 5 I/Os + 1 additional output
	ST7LITEU09	●[2,3]		2	128	128	5x10-bit		1(1/0/0)			3	5(5)	DIP8/SO8/DFN8		
16-20 pins	**ST7LITE05Y0**	●[2]		1.5	128		5x8-bit		1(1/0/0)		SPI	3	13(6)	DIP16/SO16		1% internal RC oscillator, PLL, ADC with op-amp, ROP, ICP, IAP
	ST7LITE09Y0	●[2]		1.5	128	128	5x8-bit	1x12-bit (0/1/1)	1(1/0/0)			3	13(6)	DIP16/SO16		
	ST7LIT15BF0	●[2]		2	256		7x10-bit	2x12-bit (1/4/4)	2(1/0/0)			3	17(7)	DIP20/SO20/ QFN20	2.7 to 5.5 V	1% internal RC oscillator, PLL, 32 MHz timer, ART with deadtime and enhanced one pulse mode, AWU, ADC with op-amp, analog comp., ROP, ICP, IAP, debug module
	ST7LIT15BY0	●[2]		2	256		7x10-bit		2(1/0/0)			3	13(5)	DIP16/SO16		
	ST7LIT19BF0	●[2]		2	256	128	7x10-bit		2(1/0/0)			3	17(7)	DIP20/SO20/ QFN20		
	ST7LIT19BY0	●[2]		2	256	128	7x10-bit		2(1/0/0)			3	13(5)	DIP16/SO16		
	ST7LIT15BF1	●[2]		4	256		7x10-bit		2(1/0/0)			3	17(7)	DIP20/SO20/ QFN20		
	ST7LIT15BY1	●[2]		4	256		7x10-bit		2(1/0/0)			3	13(5)	DIP16/SO16		
	ST7LIT19BF1	●[2]		4	256	128	7x10-bit		2(1/0/0)			3	17(7)	DIP20/SO20/ QFN20		
	ST7LIT19BY1	●[2]		4	256	128	7x10-bit		2(1/0/0)			3	13(5)	DIP16/SO16		
	ST7DALIF2	●[2,3]		8	384	256	7x10-bit	1x12-bit (1/4/4)	2(1/0/0)		SPI/DALI	3	15(7)	SO20	2.4 to 5.5 V	1% internal RC oscillator, PLL, 32 MHz timer, DALI, AWU, ADC with op-amp, ROP, ICP, IAP, debug module
	ST7LITE35F2	●[2,3]		8	384		7x10-bit	2x12-bit (1/4/4)	2(1/0/0)		SPI/LINSCI	3	15(7)	DIP20/SO20/ QFN20	2.7 to 5.5 V	1% internal RC oscillator, PLL, AWU, ROP, ICP, IAP, debug module
	ST7LITE39F2	●[2,3]		8	384	256	7x10-bit		1(1/0/0)			3	15(7)	DIP20/SO20/ QFN20		
	ST7LIT49MK1	●[2,3]		4	384	128	10x10-bit		2(1/0/0)		I²C	3	24(8)	LQFP32/PDIP32	2.7 to 5.5 V	
32 pins	**ST7LITE49K2**	●[2,3]		8	384	256	10x10-bit	2x12-bit (1/4/4) 1x16-bit (2/2/2)	2(1/0/0)		SPI/I²C	3	24(8)	LQFP32/PDIP32		1% internal RC oscillator, PLL, 32 MHz timer, ART with deadtime and enhanced one pulse mode, AWU, ADC with op-amp, analog comp., AWU, ROP, ICP, IAP, debug module

Abbreviations
ADC : Analog-to-digital converter
AWU : Auto wakeup from HALT
DALI : Digital addressable lighting interface
IAP : In-application programming
ICP : In-circuit programming
I²C : Inter-integrated circuit
LVD : Low-voltage detection
PLL : Phase locked loop
PWM : Pulse width modulation
ROP : Readout protection
RTC : Real-time clock timer
SCI : Serial communication interface
SPI : Serial peripheral interface
WDG : Watchdog timer

Packages
DIP : Dual in-line package
SO : Small outline
DFN : Dual flat no-lead
QFN : Quad flat no-lead

Notes
1 : Number of high-current pins included in the number of I/O pins
2 : XFlash (extended Flash for 10 kcycle min)
3 : FASTROM service available for pre-programmed devices in production quantities

Hardware and software development tools

For fast and easy application development, ST offers a wide range of tools that include starter kits, in-circuit debuggers, emulators, IDEs and C compilers from Cosmic and Raisonance with free versions that output code up to 16 Kbytes.

Part number	Starter kit	In-circuit debugger	Emulator: DVP3	Emulator: EMU3	In-circuit programmer	Socket board[5]	3rd-party programmer	
ST7LITEU0	ST7FLITE-SK/RAIS[3,8]	STX-RLINK[3,6,8] ST7-STICK[1,4,6]	ST7MDT10-DVP3[2]	ST7MDT10-EMU3	STX-RLINK[3,8] ST7-STICK[1,4]	ST7-SB10-SU0[1]	BP Microsystems www.bpmicro.com	Leap www.leap.com.tw
ST7LITEU5	ST7FLITE-SK/RAIS[3,8]	STX-RLINK[3,6,8] ST7-STICK[1,4,6]	ST7MDT10-DVP3[2]	ST7MDT10-EMU3	STX-RLINK[3,8] ST7-STICK[1,4]	ST7-SB10-SU0[1]	Data I/O www.data-io.com	RK-System www.rk-system.com.pl
ST7LITES ST7LITE0	ST7FLITE-SK/RAIS[3,8]	STX-RLINK[3,8] ST7-STICK[1,4]	ST7MDT10-DVP3[2]	ST7MDT10-EMU3	STX-RLINK[3,8] ST7-STICK[1,4]	ST7-SB10-SU0[1]	Dataman www.dataman.com	Segger www.segger.com
ST7LITE1B	ST7FLITE-SK/RAIS[3,8]	STX-RLINK[3,8] ST7-STICK[1,4]	ST7MDT10-DVP3[2]	ST7MDT10-EMU3	STX-RLINK[3,8] ST7-STICK[1,4]	ST7-SB10-123[1]	Elnec www.elnec.com	Softec Microsystems www.softecmicro.com
ST7LITE1 ST7LITE2	ST7FLITE-SK/RAIS[3,8]	STX-RLINK[3,8] ST7-STICK[1,4]	ST7MDT10-DVP3[2]	ST7MDT10-EMU3	STX-RLINK[3,8] ST7-STICK[1,4]	ST7-SB10-123[1]	HI-LO www.hilosystems.com.tw	System General www.sg.com
ST7LITE3	ST7FLITE-SK/RAIS[3,8]	STX-RLINK[3,8] ST7-STICK[1,4]	ST7MDT10-DVP3[2]	ST7MDT10-EMU3	STX-RLINK[3,8] ST7-STICK[1,4]	ST7-SB10-123[1]	Insem www.insem.co.kr	Xeltek www.xeltek.com
ST7LITE4	ST7FLI49-D/RAIS[7]	STX-RLINK[3,8] ST7-STICK[1,4]	-	-	STX-RLINK[3,8] ST7-STICK[1,4]	-		
ST7LITE4M	ST7FLI49M-D/RAIS[7]	STX-RLINK[3,8] ST7-STICK[1,4]	-	-	STX-RLINK[3,8] ST7-STICK[1,4]	-		

ST7Lite starter kit

Notes
1 Add suffix /EU, /US or /UK for the power supply for your region
2 Includes connection kit for DIP16/SO16 only. Go to www.st.com/mcu for connection kit ordering information
3 Available from ST or from Raisonance, www.raisonance.com
4 Parallel port connection to PC
5 Socket boards complement any tool with ICC capabilities (ST7-STICK, InDART, RLINK, DVP3, EMU3, etc.)
6 For in-circuit debugging of ST7FLITEUx, users must also order the AD-ICD/DS8Z adapter. For ICD of ST7FLITEUS in DFN8 package, users must order AD-ICD/DS8Z and ST7MDT10-8/DVP
7 Order code for daughter board featuring the selected MCU, which can be used with any REva starter kit (STxxxxx-SK/RAIS)
8 USB connection to PC

Web support www.st.com/mcu

Discussion forums, knowledge base, FAQs, third-party directory and newsletter

For selected STMicroelectronics sales offices fax:
China +86 21 34054689; France +33 1 55489569; Germany +49 89 4605454; Italy +39 02 8250449; Japan +81 3 57838216; Singapore +65 6481 7771;
Sweden +46 8 58774411; Switzerland +41 22 9292900; United Kingdom and Eire +44 1628 890391; USA +1 781 861 2678

Full product information at www.st.com

Order code: BRST7LITE0208