![ST logo]

ST7FLITE2

8-BIT MCU WITH SINGLE VOLTAGE FLASH MEMORY, DATA EEPROM, ADC, TIMERS, SPI

DATA BRIEFING

■ **Memories**
- 8 Kbytes single voltage extended Flash (XFlash) Program memory with read-out protection, In-Circuit Programming and In-Application programming (ICP and IAP)
- 384 bytes RAM
- 256 bytes data EEPROM with read-out protection

■ **Clock, Reset and Supply Management**
- Enhanced reset system
- Enhanced low voltage supervisor (LVD) for main supply and an auxiliary voltage detector (AVD) with interrupt capability for implementing safe power-down procedures
- Clock sources: Internal 1% RC oscillator, crystal/ceramic resonator or external clock
- Internal 32-MHz input clock for Auto-reload timer
- Optional x4 or x8 PLL for 4 or 8 MHz internal clock
- Five Power Saving Modes: Halt, Active-Halt, Wait and Slow, Auto Wake Up From Halt

■ **I/O Ports**
- Up to 15 multifunctional bidirectional I/O lines
- 7 high sink outputs

■ **2 Timers**
- 8-bit Lite Timer with prescaler, watchdog, 1 realtime base and 1 input capture
- One 12-bit Auto-reload Timer with 4 PWM outputs, input capture and output compare functions

DIP20

SO20 300"
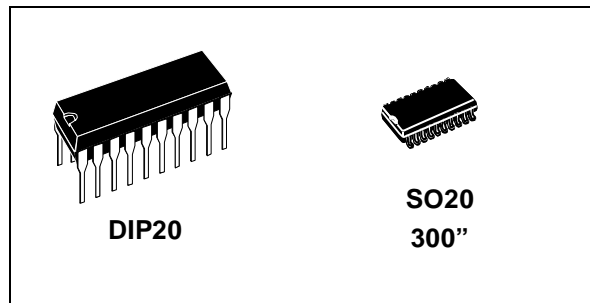
■ **1 Communication Interface**
- SPI synchronous serial interface

■ **Interrupt Management**
- 10 interrupt vectors plus TRAP and RESET
- 15 external interrupt lines (on 4 vectors)

■ **A/D Converter**
- 7 input channels
- Fixed gain Op-amp
- 13-bit resolution for 0 to 430 mV (@ 5V V_{DD})
- 10-bit resolution for 430 mV to 5V (@ 5V V_{DD})

■ **Instruction Set**
- 8-bit data manipulation
- 63 basic instructions
- 17 main addressing modes
- 8 x 8 unsigned multiply instructions

■ **Development Tools**
- Full hardware/software development package
- ICD (Debug module)

Device Summary

Features	ST7FLITE20	ST7FLITE25	ST7FLITE29
Program memory - bytes	8K		
RAM (stack) - bytes	384 (128)		
Data EEPROM - bytes	-	-	256
Peripherals	Lite Timer with Watchdog, Autoreload Timer, SPI, 10-bit ADC with Op-Amp	Lite Timer with Watchdog, Autoreload Timer with 32-MHz input clock, SPI, 10-bit ADC with Op-Amp	
Operating Supply	2.4V to 5.5 V		
CPU Frequency	Up to 8Mhz (w/ ext OSC up to 8MHz)	Up to 8Mhz (w/ ext OSC up to 8MHz and int 1MHz RC 1% PLLx8/4MHz)	
Operating Temperature	-40°C to +85°C		
Packages	SO20 300", DIP20		

Rev. 1.7

1 INTRODUCTION

The ST7FLITE2 is a member of the ST7 microcontroller family. All ST7 devices are based on a common industry-standard 8-bit core, featuring an enhanced instruction set.

The ST7FLITE2 features FLASH memory with byte-by-byte In-Circuit Programming (ICP) and In-Application Programming (IAP) capability.

Under software control, the ST7FLITE2 device can be placed in WAIT, SLOW, or HALT mode, reducing power consumption when the application is in idle or standby state.

The enhanced instruction set and addressing modes of the ST7 offer both power and flexibility to software developers, enabling the design of highly efficient and compact application code. In addition to standard 8-bit data management, all ST7 microcontrollers feature true bit manipulation, 8x8 unsigned multiplication and indirect addressing modes.

The devices feature an on-chip Debug Module (DM) to support in-circuit debugging (ICD). For a description of the DM registers, refer to the ST7 ICC Protocol Reference Manual.

Figure 1. General Block Diagram
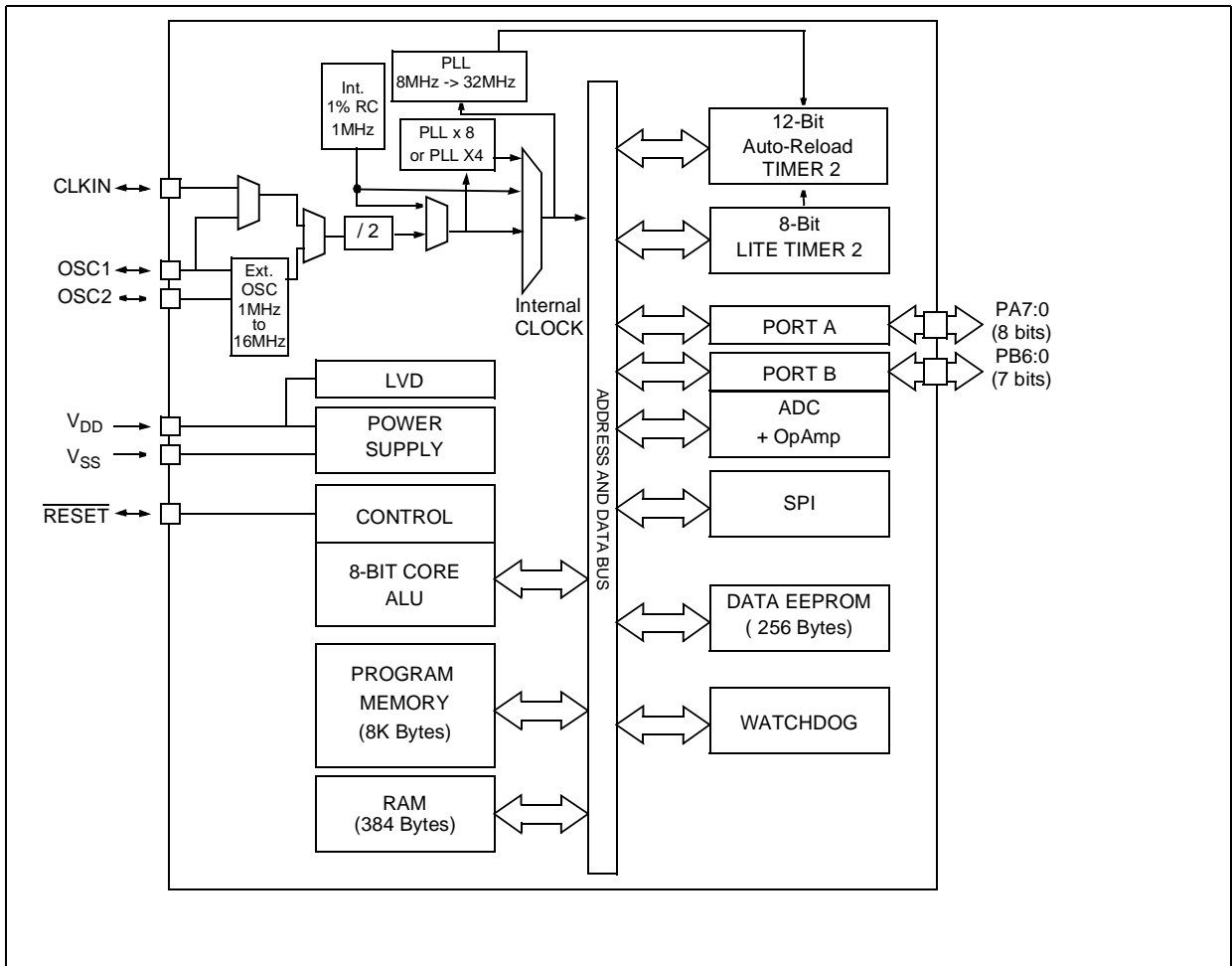
2 PIN DESCRIPTION

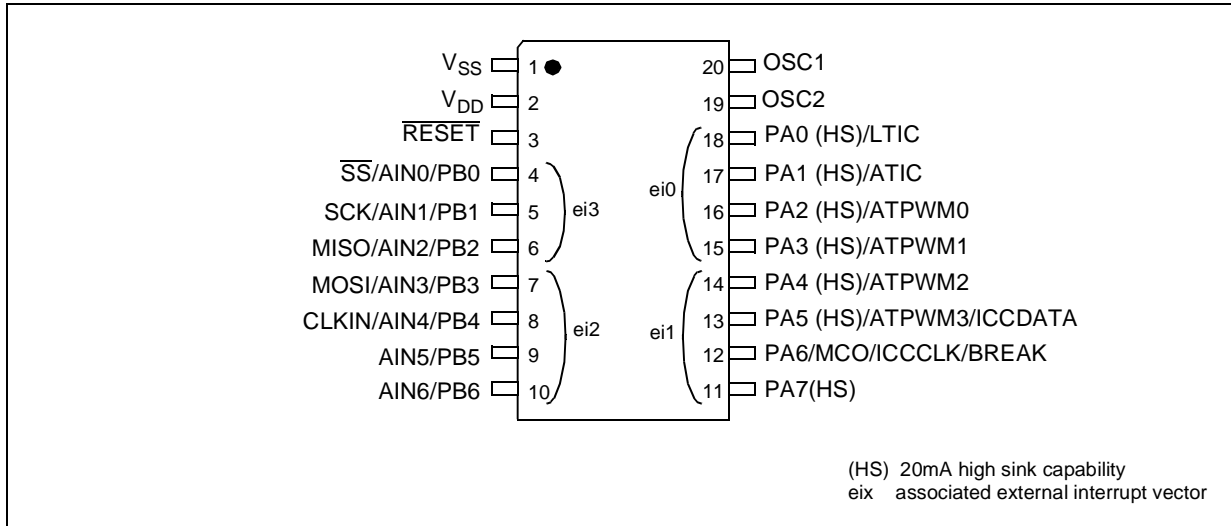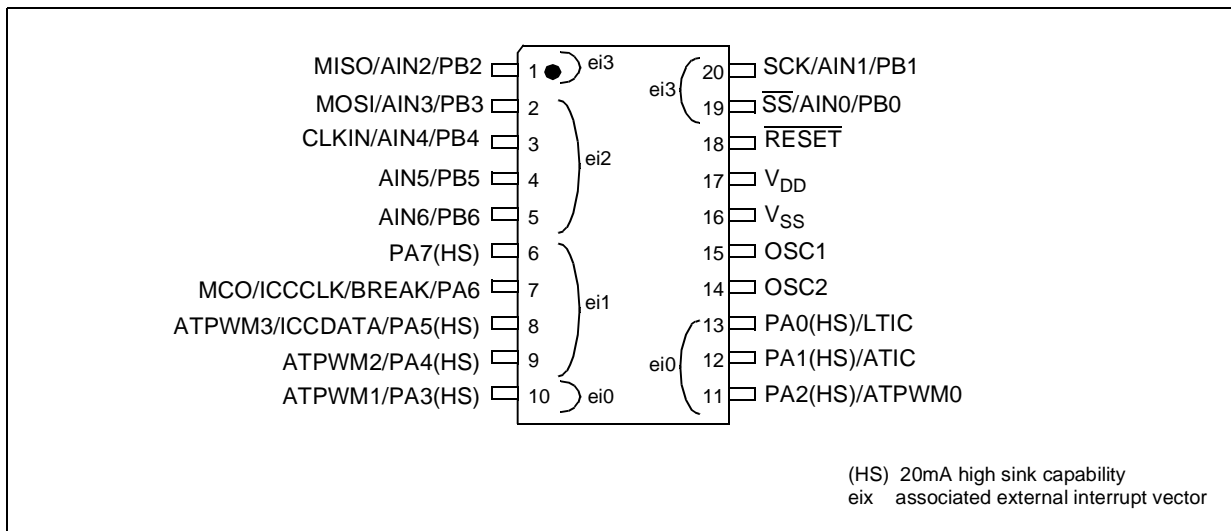**Figure 2. 20-Pin SO Package Pinout (ST7FLITE2x)**

Figure 3. 20-Pin DIP Package Pinout (ST7FLITE2x)

PIN DESCRIPTION (Cont'd)

Legend / Abbreviations for Table 1**:**

Type: I = input, O = output, S = supply

In/Output level: C_T= CMOS $0.3V_{DD}/0.7V_{DD}$ with input trigger

Output level: HS = 20mA high sink (on N-buffer only)

Port and control configuration:
 – Input: float = floating, wpu = weak pull-up, int = interrupt, ana = analog
 – Output: OD = open drain, PP = push-pull

The RESET configuration of each pin is shown in bold which is valid as long as the device is in reset state.

Table 1. Device Pin Description

Pin No. SO20 (ST7FLITE2x)	Pin No. DIP20 (ST7FLITE2x)	Pin Name	Type	Level Input	Level Output	Port / Control Input float	Port / Control Input wpu	Port / Control Input int	Port / Control Input ana	Port / Control Output OD	Port / Control Output PP	Main Function (after reset)	Alternate Function
1	16	V_{SS}	S									Ground	
2	17	V_{DD}	S									Main power supply	
3	18	$\overline{RESET}$	I/O	C_T			X			X		Top priority non maskable interrupt (active low)	
4	19	PB0/AIN0/$\overline{SS}$	I/O		C_T	**X**	ei3		X	X	X	**Port B0**	ADC Analog Input 0 or SPI Slave Select (active low)
5	20	PB1/AIN1/SCK	I/O		C_T	**X**	ei3		X	X	X	**Port B1**	ADC Analog Input 1 or SPI Serial Clock
6	1	PB2/AIN2/MISO	I/O		C_T	**X**	ei3		X	X	X	**Port B2**	ADC Analog Input 2 or SPI Master In/ Slave Out Data
7	2	PB3/AIN3/MOSI	I/O		C_T	**X**	ei2		X	X	X	**Port B3**	ADC Analog Input 3 or SPI Master Out / Slave In Data
8	3	PB4/AIN4/CLKIN	I/O		C_T	**X**	ei2		X	X	X	**Port B4**	ADC Analog Input 4 or External clock input
9	4	PB5/AIN5	I/O		C_T	**X**	ei2		X	X	X	**Port B5**	ADC Analog Input 5
10	5	PB6/AIN6	I/O		C_T	**X**	ei2		X	X	X	**Port B6**	ADC Analog Input 6
11	6	PA7	I/O	C_T	HS	**X**	ei1			X	X	**Port A7**	
12	7	PA6 /MCO/ ICCCLK/BREAK	I/O		C_T	**X**	ei1			X	X	**Port A6**	Main Clock Output or In Circuit Communication Clock or External BREAK
13	8	PA5 /ATPWM3/ ICCDATA	I/O	C_T	HS	**X**	ei1			X	X	**Port A5**	Auto-Reload Timer PWM3 or In Circuit Communication Data
14	9	PA4/ATPWM2	I/O	C_T	HS	**X**	ei1			X	X	**Port A4**	Auto-Reload Timer PWM2

Pin No. SO20 (ST7FLITE2x)	Pin No. DIP20 (ST7FLITE2x)	Pin Name	Type	Level Input	Level Output	Input float	Input wpu	Input int	Input ana	Output OD	Output PP	Main Function (after reset)	Alternate Function
15	10	PA3/ATPWM1	I/O	C_T	HS	X				X	X	**Port A3**	Auto-Reload Timer PWM1
16	11	PA2/ATPWM0	I/O	C_T	HS	X		ei0		X	X	**Port A2**	Auto-Reload Timer PWM0
17	12	PA1/ATIC	I/O	C_T	HS	X				X	X	**Port A1**	Auto-Reload Timer Input Capture
18	13	PA0/LTIC	I/O	C_T	HS	X				X	X	**Port A0**	Lite Timer Input Capture
19	14	OSC2	O									Resonator oscillator inverter output	
20	15	OSC1	I									Resonator oscillator inverter input	

3 PACKAGE CHARACTERISTICS

3.1 PACKAGE MECHANICAL DATA
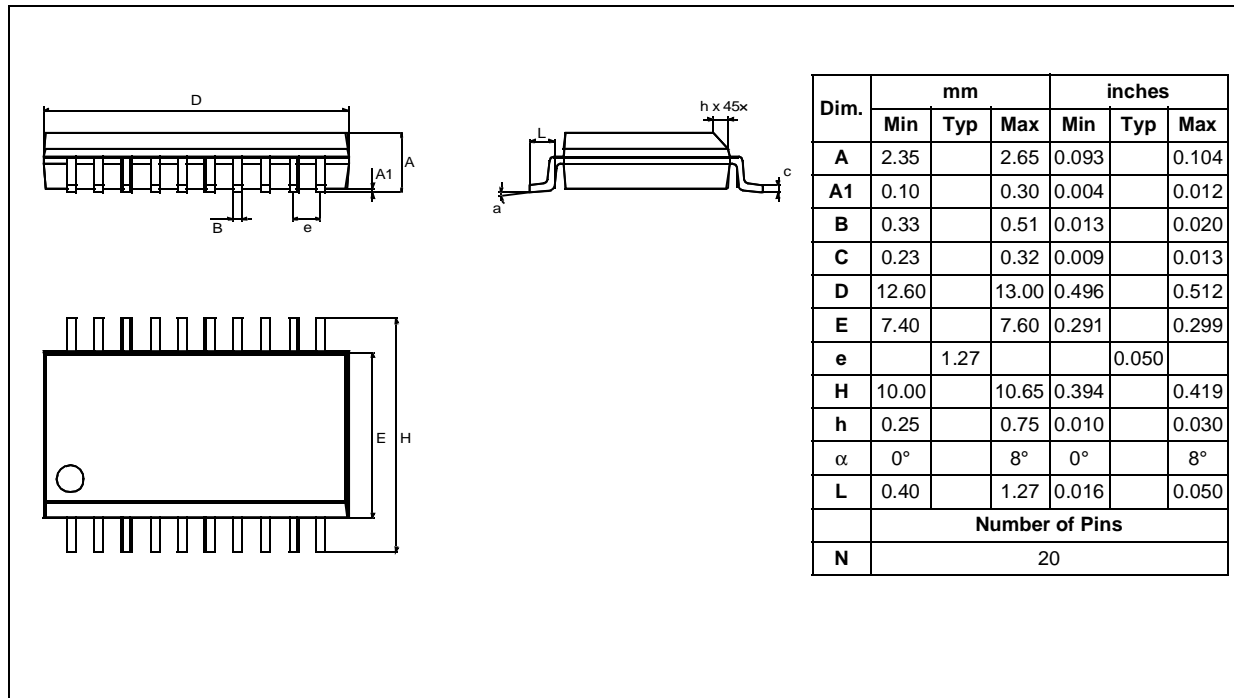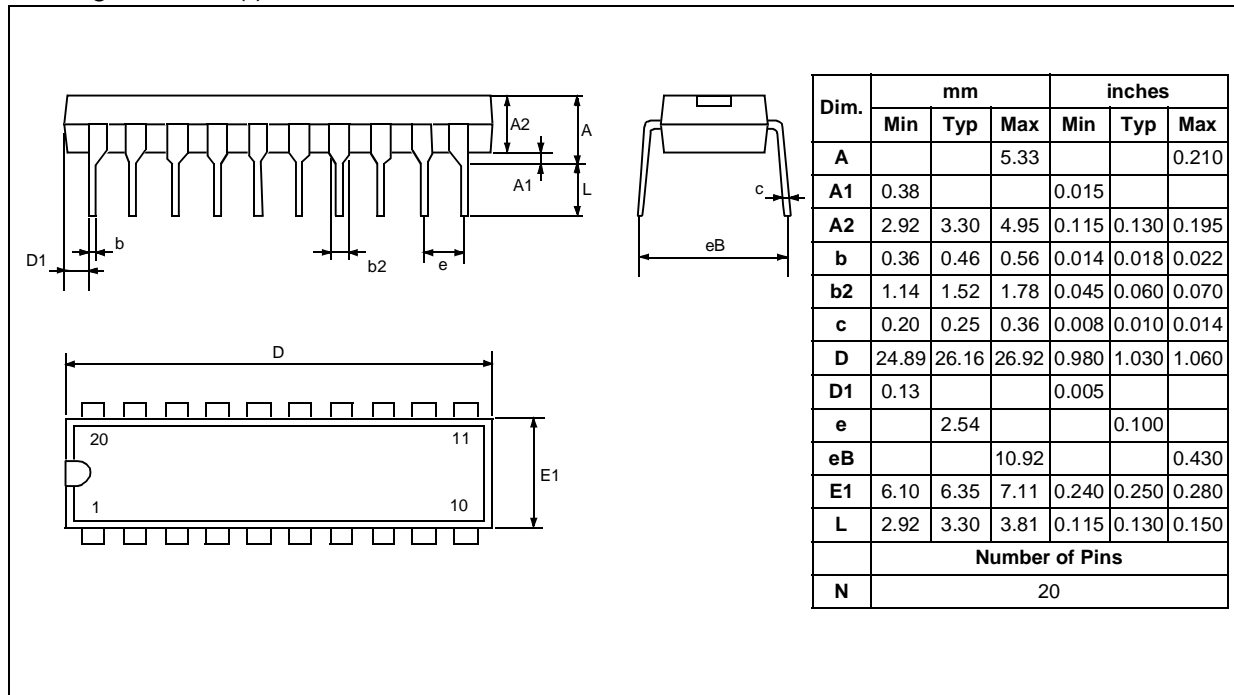
Figure 4. 20-Pin Plastic Small Outline Package, 300-mil Width

Dim.	mm			inches		
	Min	Typ	Max	Min	Typ	Max
A	2.35		2.65	0.093		0.104
A1	0.10		0.30	0.004		0.012
B	0.33		0.51	0.013		0.020
C	0.23		0.32	0.009		0.013
D	12.60		13.00	0.496		0.512
E	7.40		7.60	0.291		0.299
e		1.27			0.050	
H	10.00		10.65	0.394		0.419
h	0.25		0.75	0.010		0.030
α	0°		8°	0°		8°
L	0.40		1.27	0.016		0.050
	Number of Pins					
N	20					

Figure 5. 20-Pin Plastic Dual In-Line Package, 300-mil Width

Package Outline (1)

Dim.	mm			inches		
	Min	Typ	Max	Min	Typ	Max
A			5.33			0.210
A1	0.38			0.015		
A2	2.92	3.30	4.95	0.115	0.130	0.195
b	0.36	0.46	0.56	0.014	0.018	0.022
b2	1.14	1.52	1.78	0.045	0.060	0.070
c	0.20	0.25	0.36	0.008	0.010	0.014
D	24.89	26.16	26.92	0.980	1.030	1.060
D1	0.13			0.005		
e		2.54			0.100	
eB			10.92			0.430
E1	6.10	6.35	7.11	0.240	0.250	0.280
L	2.92	3.30	3.81	0.115	0.130	0.150
	Number of Pins					
N	20					

Notes: