Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

C8051F70x/71x

Mixed Signal ISP Flash MCU Family

Capacitance to Digital Converter
- Supports buttons, sliders, wheels, capacitive proximity, and touch screen sensing
- Up to 38 input channels
- Fast 40 µs per channel conversion time
- 12, 13, 14, or 16-bit output
- Auto-scan and wake-on-touch
- Auto-accumulate 4, 8, 16, 32, or 64 samples

10-Bit Analog to Digital Converter
- Up to 500 ksps
- Up to 16 external single-ended inputs
- VREF from on-chip VREF, external pin or V_{DD}
- Internal or external start of conversion source
- Built-in temperature sensor

Analog Comparator
- Programmable hysteresis and response time
- Configurable as interrupt or reset source

On-Chip Debug
- On-chip debug circuitry facilitates full speed, non-intrusive in-system debug (no emulator required)
- Provides breakpoints, single stepping, inspect/modify memory and registers
- Superior performance to emulation systems using ICE-chips, target pods, and sockets
- Low cost, **complete** development kit

Supply Voltage 1.8 to 3.6 V
- Built-in voltage supply monitor

High-Speed 8051 µC Core
- Pipelined instruction architecture; executes 70% of instructions in 1 or 2 system clocks
- Up to 25 MIPS throughput with 25 MHz clock
- Expanded interrupt handler

Memory
- 512 bytes internal data RAM (256 + 256)
- Up to 16 kB Flash; In-system programmable in 512-byte Sectors
- Up to 32-byte data EEPROM

Digital Peripherals
- Up to 54 Port I/O with high sink current
- Hardware enhanced UART, SMBus™ (I^2C compatible), and enhanced SPI™ serial ports
- Four general purpose 16-bit counter/timers
- 16-Bit programmable counter array (PCA) with 3 capture/compare modules and enhanced PWM functionality
- Real time clock mode using timer and crystal

Clock Sources
- 24.5 MHz ±2% Oscillator Supports crystal-less UART operation
- External oscillator: Crystal, RC, C, or clock (1 or 2 pin modes)
- Can switch between clock sources on-the-fly; useful in power saving modes

64-Pin TQFP, 48-Pin TQFP, 48-Pin QFN, 32-Pin QFN, 24-Pin QFN
Temperature Range: –40 to +85 °C

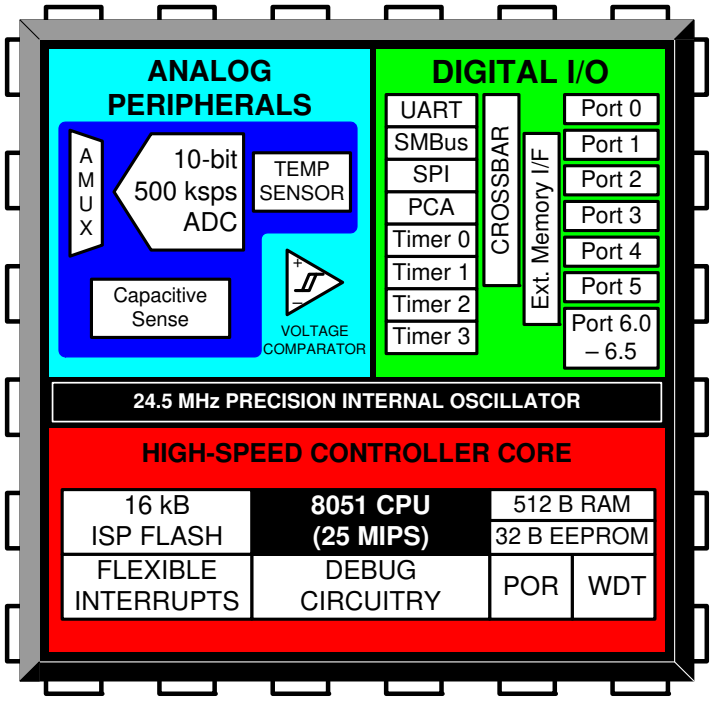

Table of Contents

List of Figures

List of Tables

List of Registers

1. System Overview

C8051F70x/71x devices are fully integrated, system-on-a-chip, capacitive sensing mixed-signal MCUs. Highlighted features are listed below. Refer to Table 2.1 for specific product feature selection and part ordering numbers.

- High-speed pipelined 8051-compatible microcontroller core (up to 25 MIPS)
- In-system, full-speed, non-intrusive debug interface (on-chip)
- Capacitive Sense interface with 38 input channels
- 10-bit 500 ksps single-ended ADC with 16 external channels and integrated temperature sensor
- Precision calibrated 24.5 MHz internal oscillator
- 16 kB of on-chip Flash memory
- 512 bytes of on-chip RAM
- SMBus/I^2C, Enhanced UART, and Enhanced SPI serial interfaces implemented in hardware
- Four general-purpose 16-bit timers
- Programmable Counter/Timer Array (PCA) with three capture/compare modules
- On-chip internal voltage reference
- On-chip Watchdog timer
- On-chip Power-On Reset and Supply Monitor
- On-chip Voltage Comparator
- 54 general purpose I/O

With on-chip power-on reset, V_{DD} monitor, watchdog timer, and clock oscillator, the C8051F70x/71x devices are truly stand-alone, system-on-a-chip solutions. The Flash memory can be reprogrammed even in-circuit, providing non-volatile data storage, and also allowing field upgrades of the 8051 firmware. User software has complete control of all peripherals, and may individually shut down any or all peripherals for power savings.

The C8051F70x/71x processors include Silicon Laboratories' 2-Wire C2 Debug and Programming interface, which allows non-intrusive (uses no on-chip resources), full speed, in-circuit debugging using the production MCU installed in the final application. This debug logic supports inspection of memory, viewing and modification of special function registers, setting breakpoints, single stepping, and run and halt commands. All analog and digital peripherals are fully functional while debugging using C2. The two C2 interface pins can be shared with user functions, allowing in-system debugging without occupying package pins.

Each device is specified for 1.8–3.6 V operation over the industrial temperature range (–45 to +85 °C). An internal LDO is used to supply the processor core voltage at 1.8 V. The Port I/O and $\overline{RST}$ pins are tolerant of input signals up to 2 V above the V_{DD} supply, with the exception of P0.3. See Table 2.1 for ordering information. Block diagrams of the devices in the C8051F70x/71x family are shown in Figure 1.1.

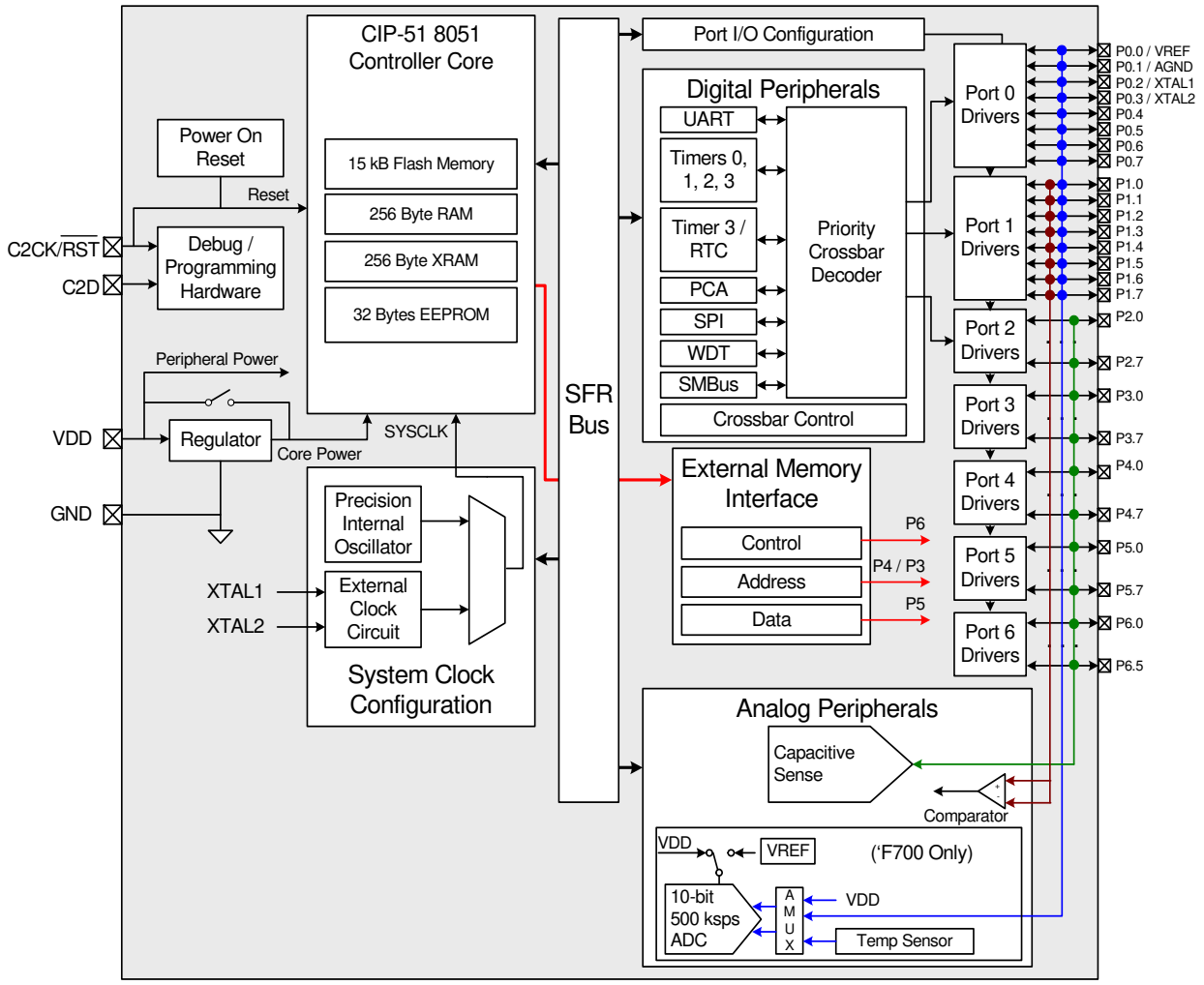

Figure 1.1. C8051F700/1 Block Diagram

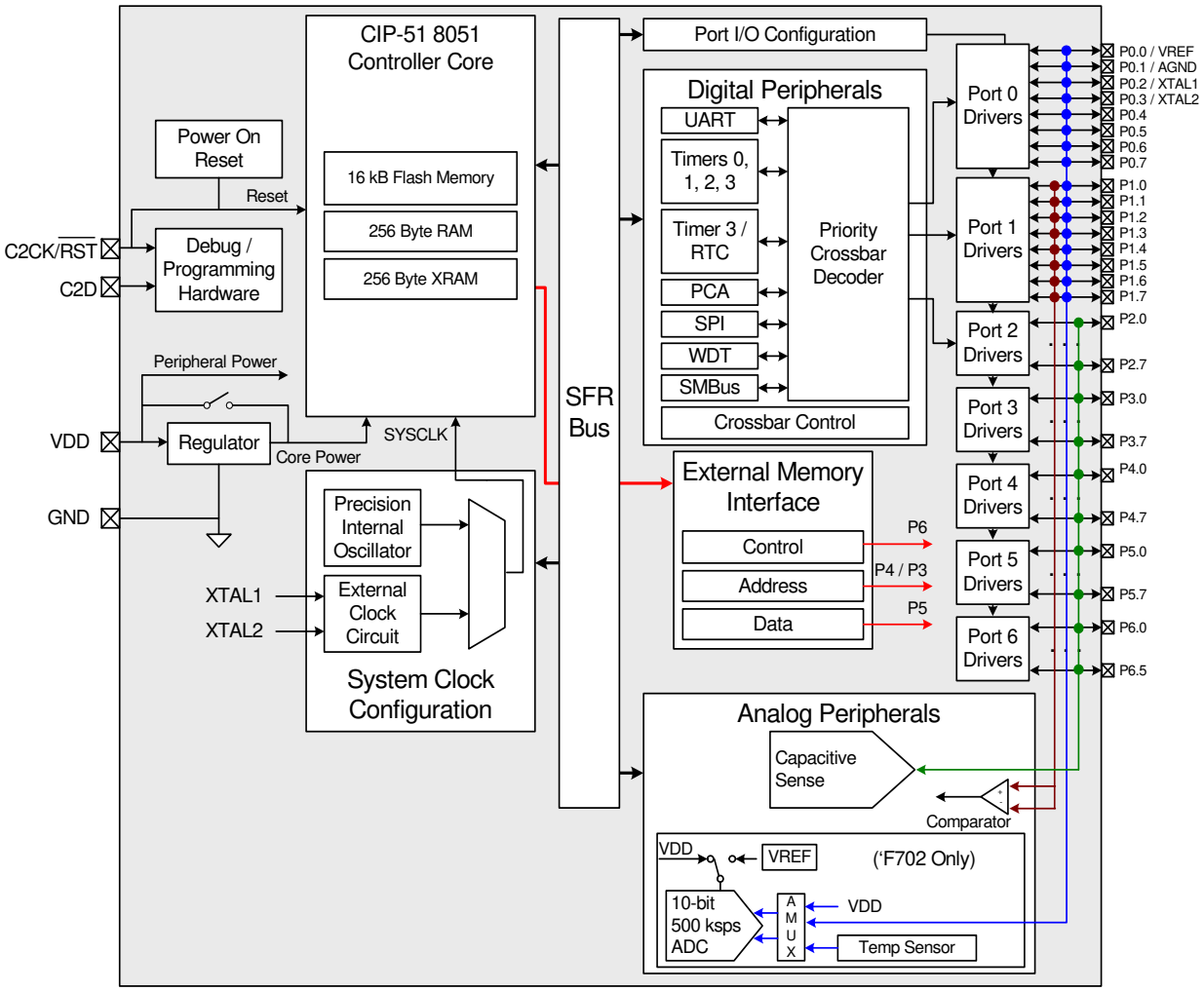

Figure 1.2. C8051F702/3 Block Diagram

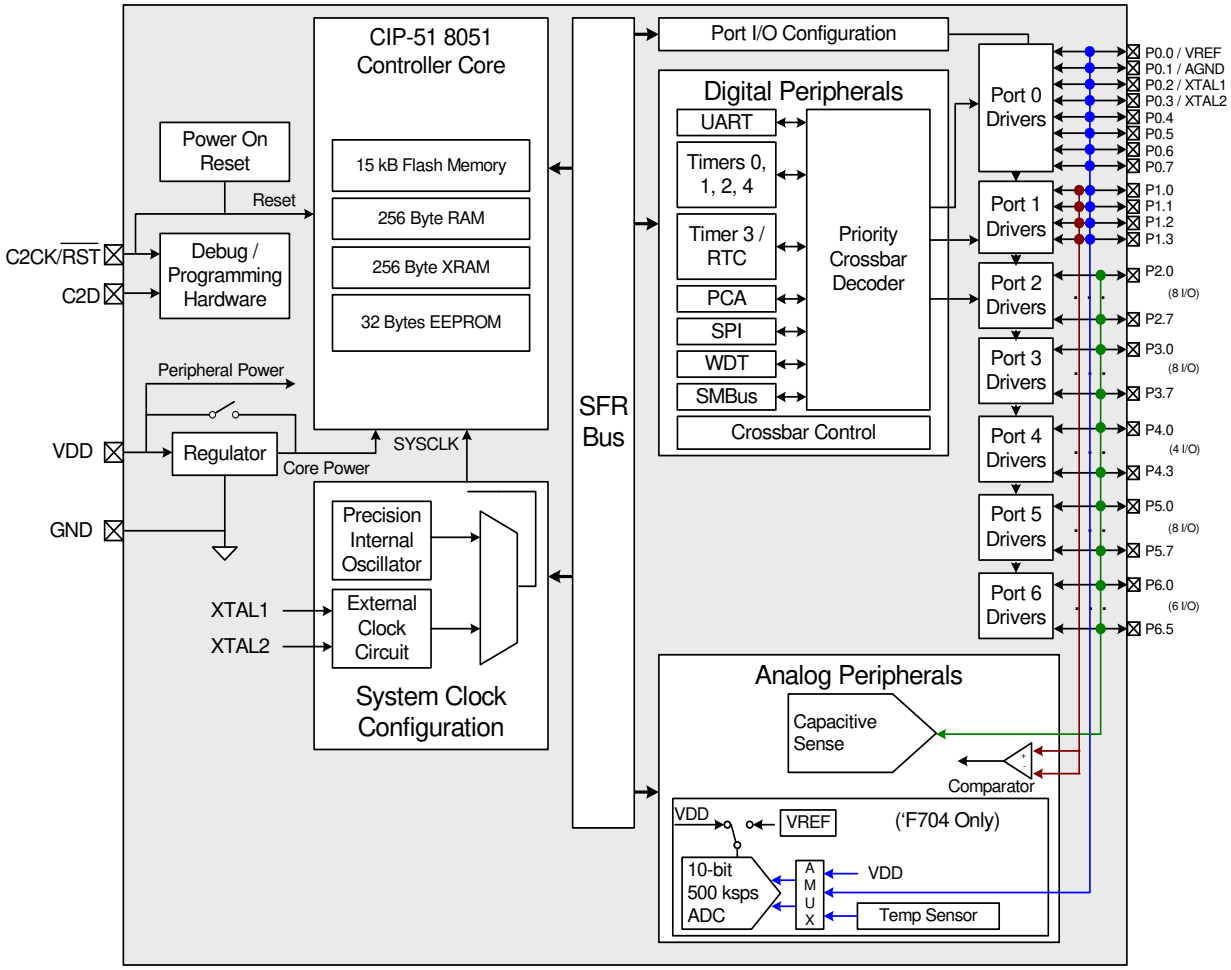

Figure 1.3. C8051F704/5 Block Diagram

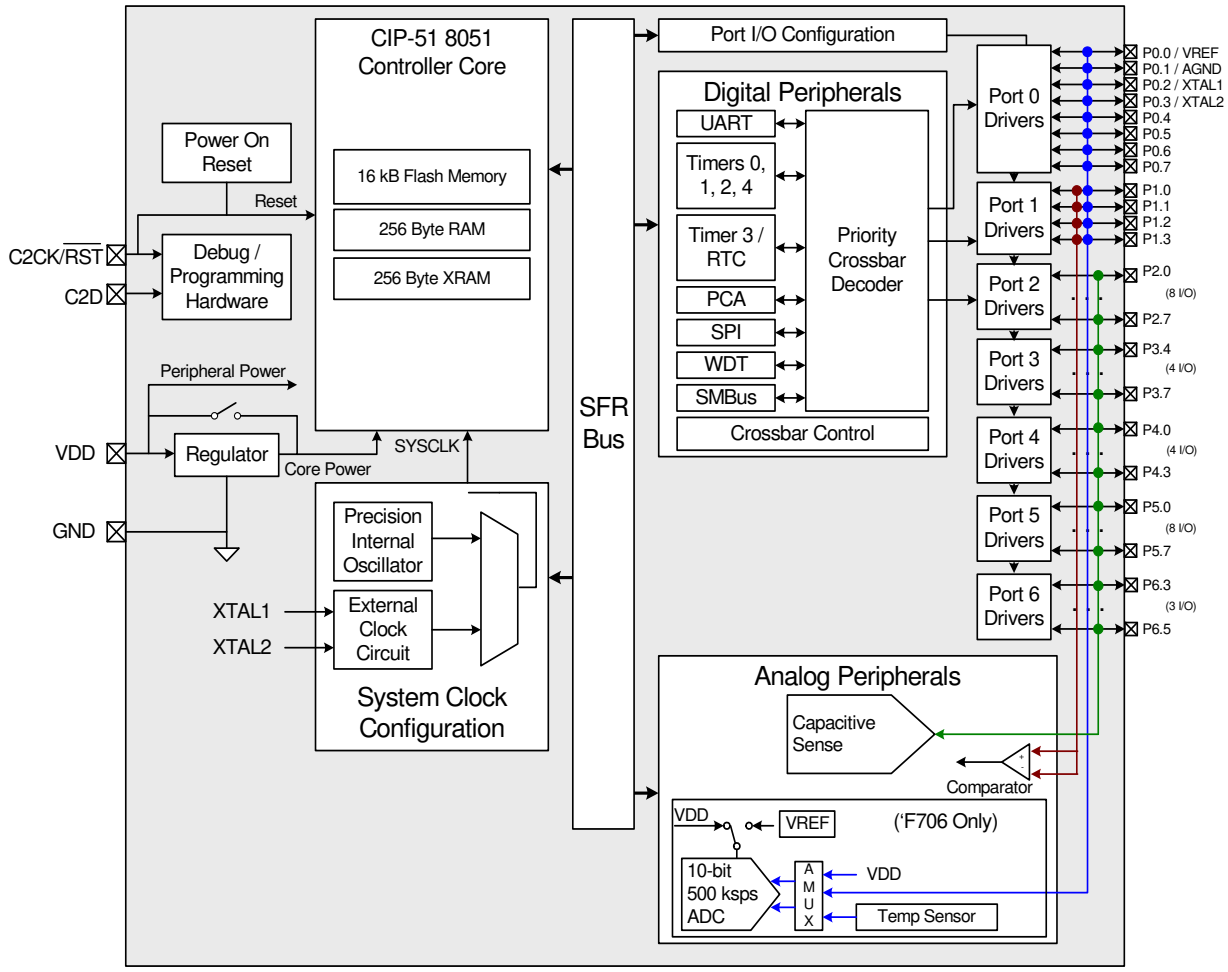

Figure 1.4. C8051F706/07 Block Diagram

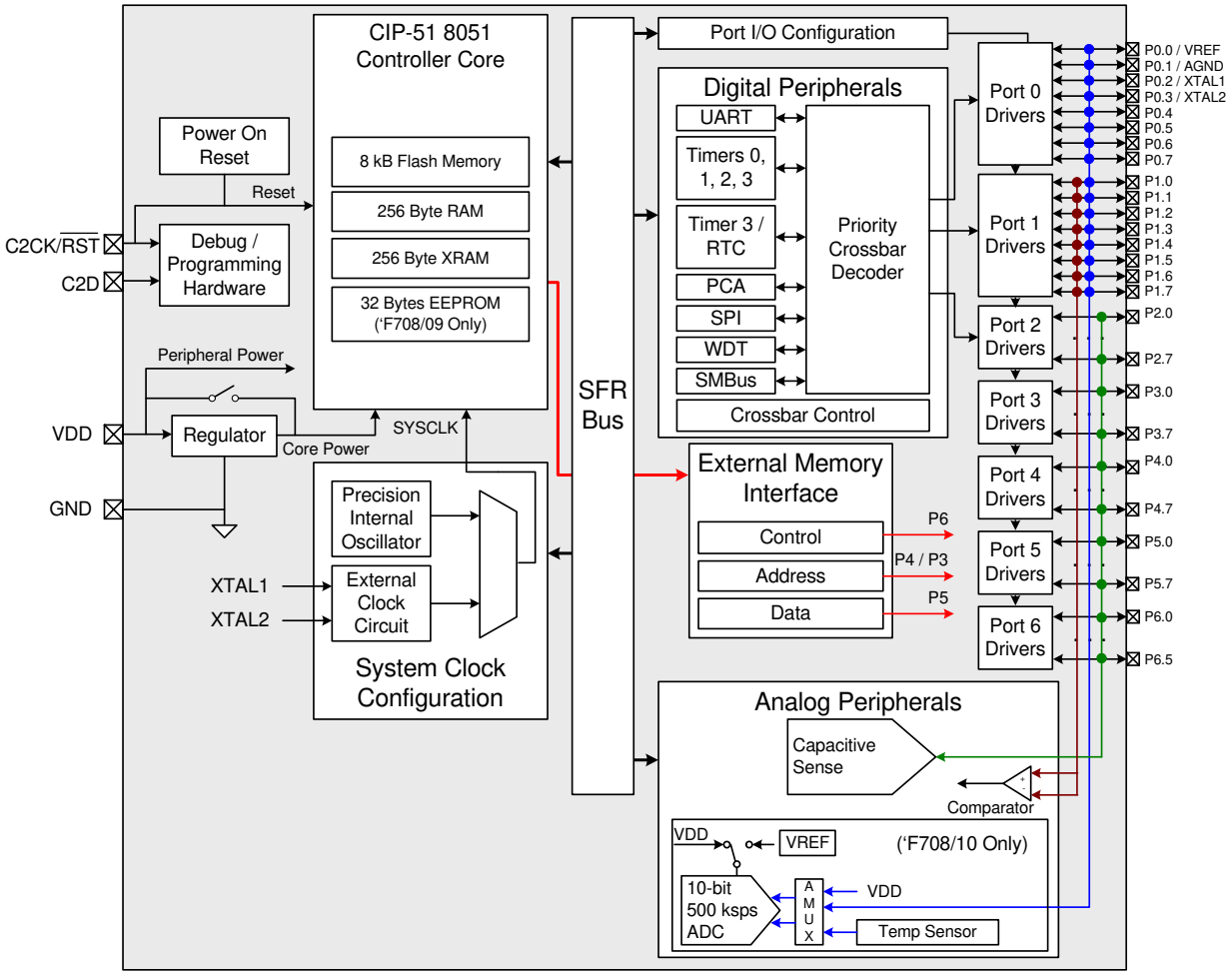

Figure 1.5. C8051F708/09/10/11 Block Diagram

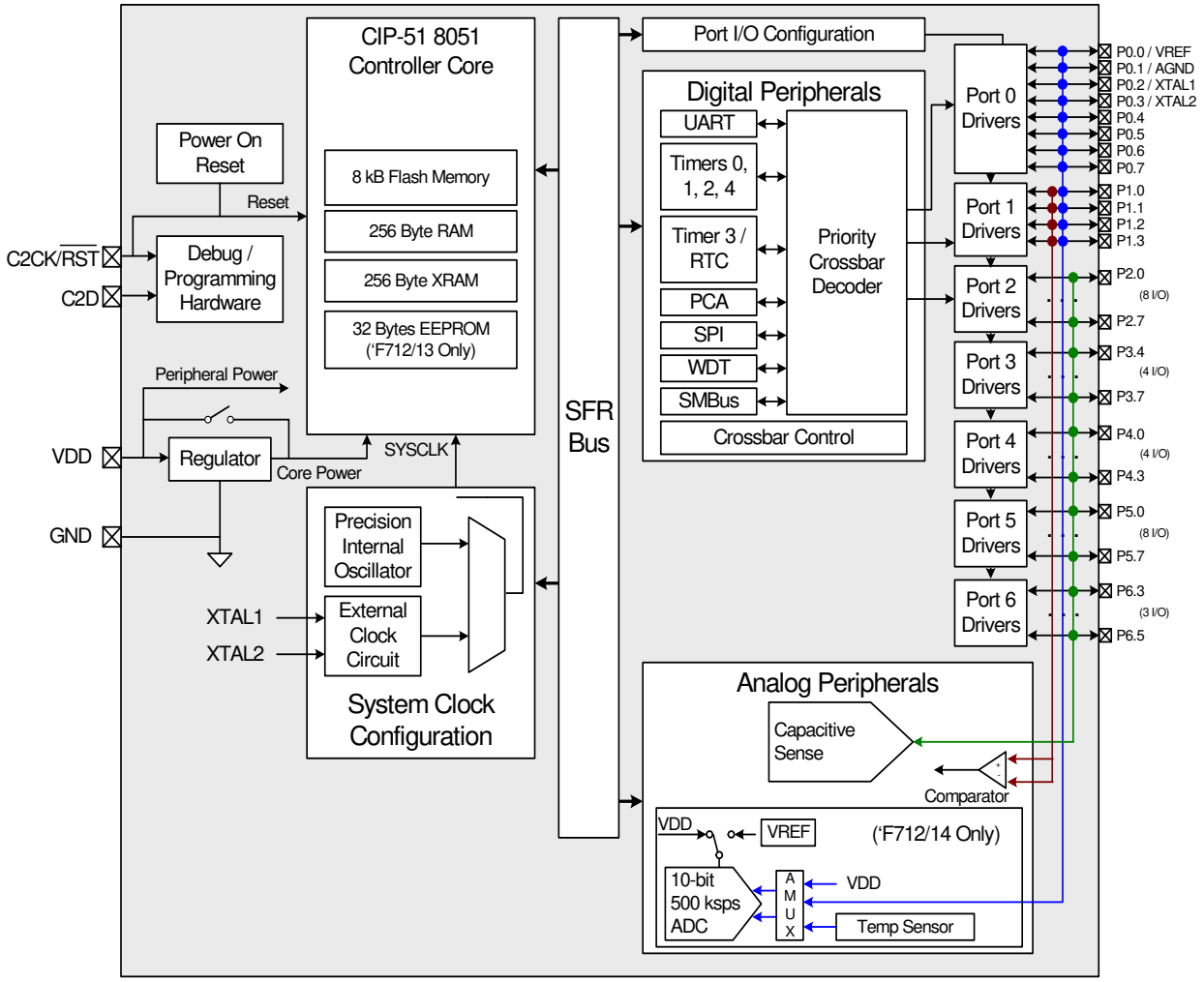

Figure 1.6. C8051F712/13/14/15 Block Diagram

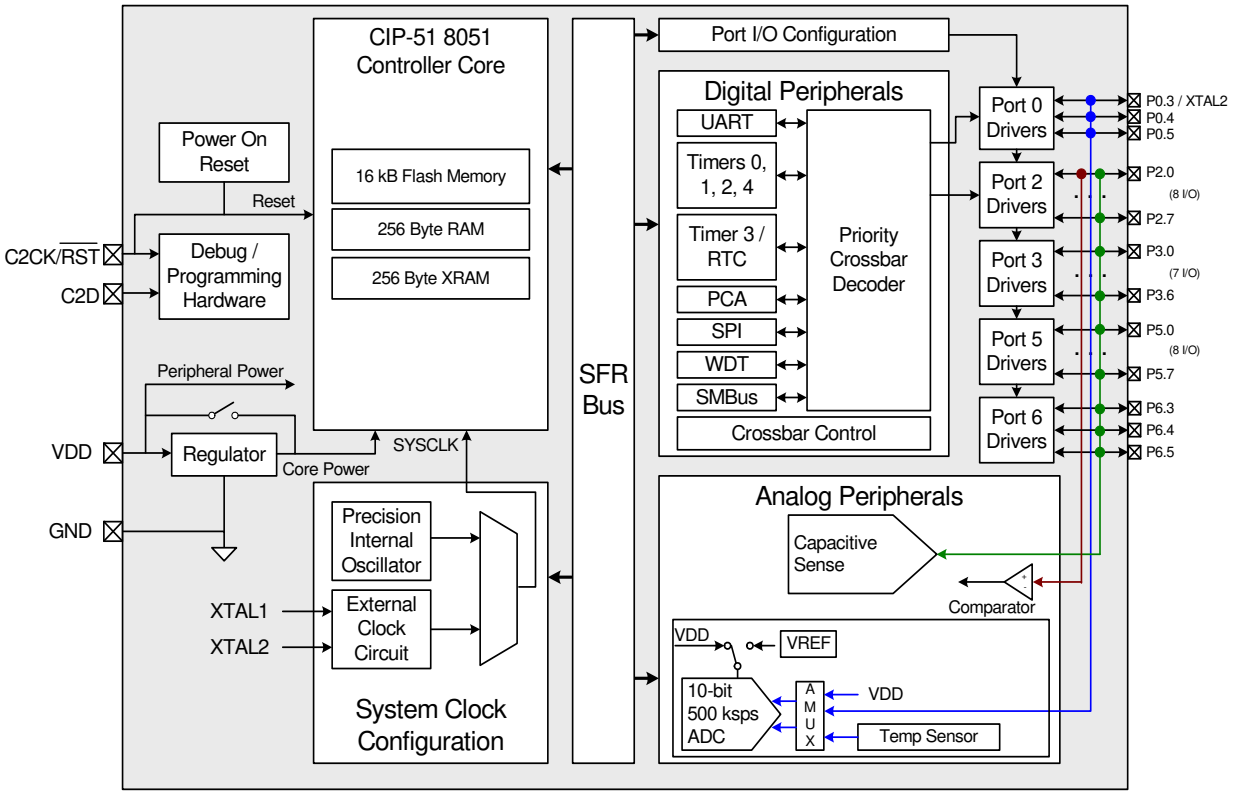

Figure 1.7. C8051F716 Block Diagram

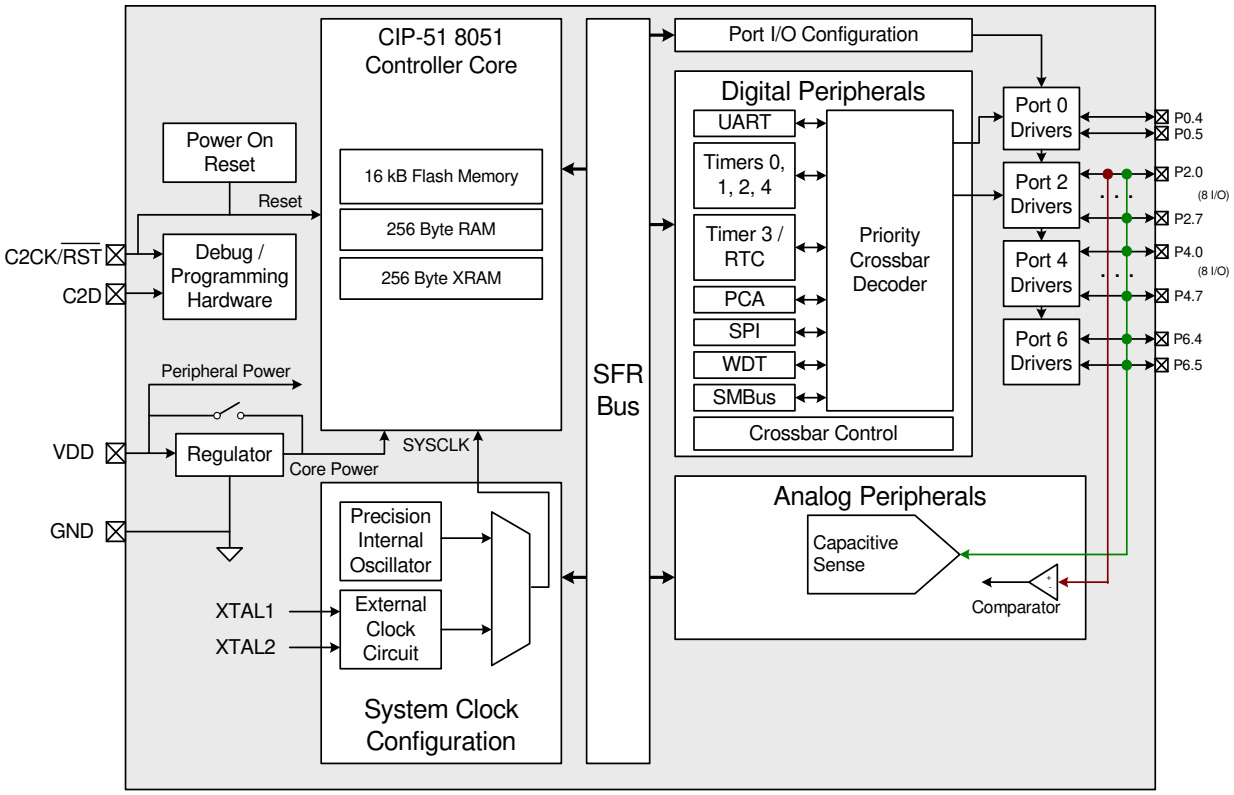

Figure 1.8. C8051F717 Block Diagram