Analog Peripherals

10-Bit ADC

- ±1 LSB INL; no missing codes
- Programmable throughput up to 200 ksps
- Up to 13 external inputs
- VREF from external pin or VDD
- Internal or external start of conversion sources
- Data-dependent windowed interrupt generator

Built-in temperature sensor (±3 °C)

Comparator

- Programmable hysteresis and response time
- Configurable to generate interrupts or reset
- Low current (<0.5 µA)

POR/Brown-Out Detector

On-Chip Debug

- On-chip debug circuitry facilitates full speed, non-intrusive in-system debug (no emulator required)
- Provides breakpoints, single stepping, watchpoints
- Inspect/modify memory, registers, and stack
- Superior performance to emulation systems using ICE-chips, target pods, and sockets

Supply Voltage: 2.7 to 3.6 V

- Typical operating current: 5 mA at 25 MHz
- Typical: 11 µA at 32 kHz
- Target stop mode current: <0.1 µA

Temperature Range: –40 to +85 °C

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 system clock
- Expanded interrupt handler

Memory

- 1280 bytes data RAM (1024 + 256)
- 16 kB Flash; in-system programmable in 512-byte sectors (512 bytes are reserved)
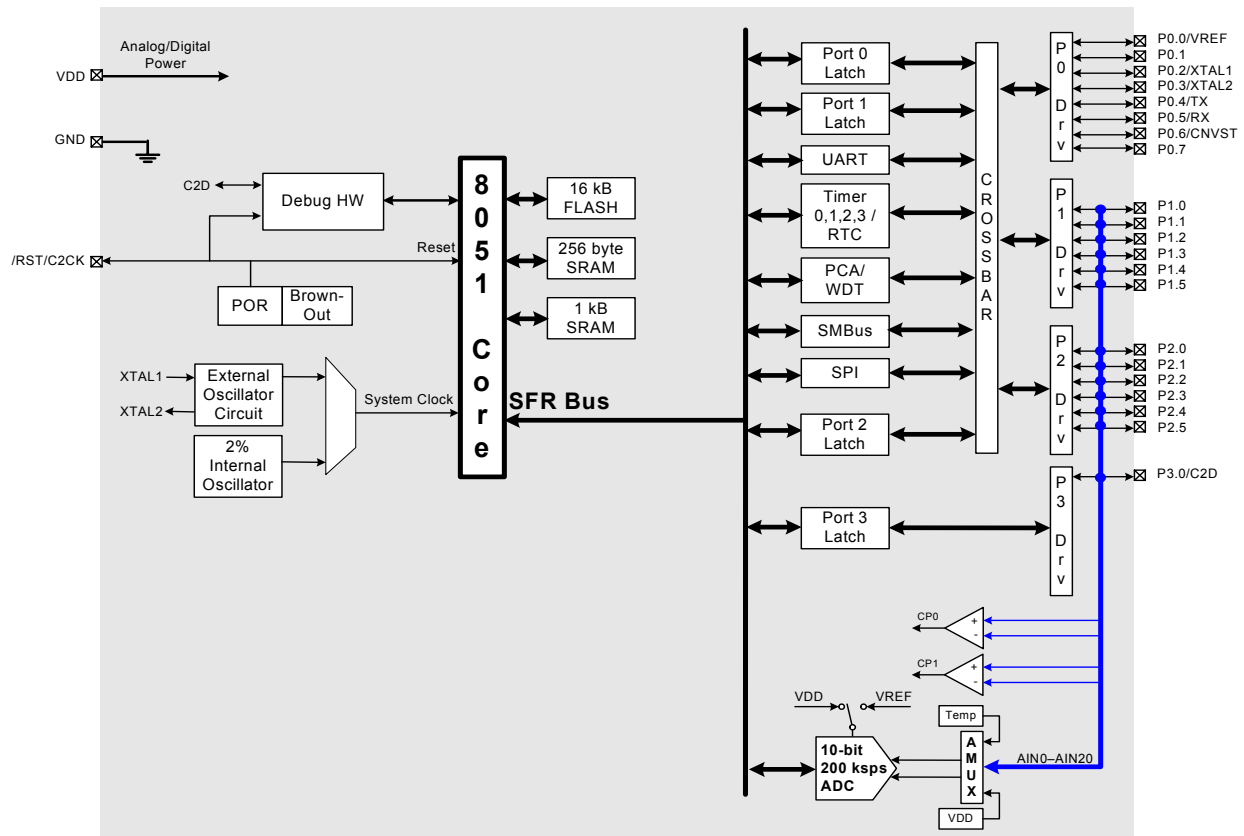
Digital Peripherals

- 21 port I/O; all are 5 V tolerant
- 1 Enhanced Hardware SMBus™ (I2C™ compatible) and UART serial port
- Programmable 16-bit counter/timer array with three capture/compare modules, WDT
- 5 general-purpose 16-bit counter/timers
- Dedicated watchdog timer; bidirectional reset
- Real-time clock mode for maximum power saving

Clock Sources

- Internal oscillator: 24.5 MHz, 2% accuracy supports UART operation
- External oscillator: Crystal, RC, C, or Clock (1 or 2 pin modes)
- Can switch between clock sources on-the-fly

Package
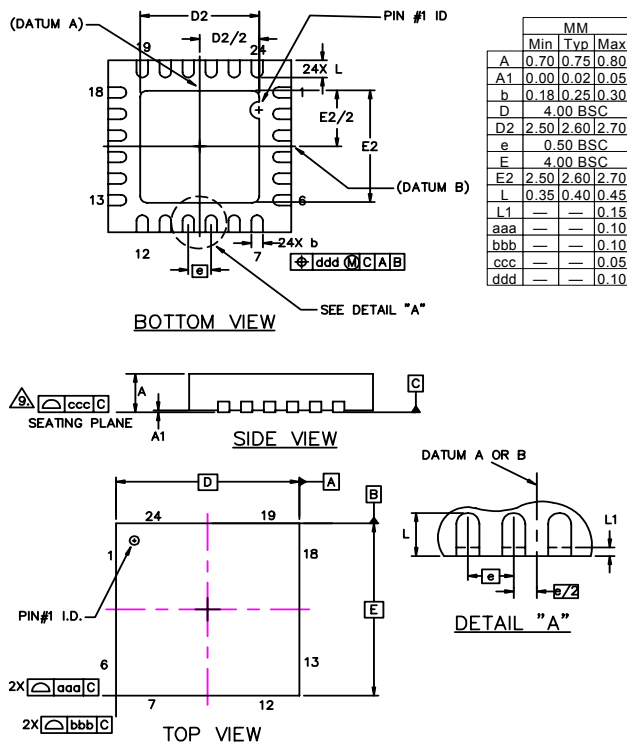
- 24-pin QFN (lead-free package)

Selected Electrical Specifications

(T_A = –40 to +85 C°, V_{DD} = 2.7 V unless otherwise specified)

Parameter	Conditions	Min	Typ	Max	Units
Global Characteristics					
Supply Voltage		2.7	—	3.6	V
Supply Current	Clock = 25 MHz	—	6.4	—	mA
	Clock = 1 MHz	—	0.36	—	mA
	Clock = 32 kHz; V_{DD} Monitor Disabled	—	9	—	µA
Supply Current (shutdown)	Oscillator off; V_{DD} Monitor Enabled	—	10	—	µA
	Oscillator off; V_{DD} Monitor Disabled		<0.1		µA
Clock Frequency Range		DC	—	25	MHz
Internal Oscillator					
Frequency		24.0	24.5	25	MHz
A/D Converter					
Resolution		—	10	—	bits
Integral Nonlinearity		—	±0.5	$\pm$1	LSB
Differential Nonlinearity	Guaranteed Monotonic	—	±0.5	$\pm$1	LSB
Signal-to-Noise Plus Distortion		53	55.5	—	dB
ThroughPut Rate		—	—	200	ksps

Package Information

	MM		
	Min	Typ	Max
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
b	0.18	0.25	0.30
D	4.00 BSC		
D2	2.50	2.60	2.70
e	0.50 BSC		
E	4.00 BSC		
E2	2.50	2.60	2.70
L	0.35	0.40	0.45
L1	—	—	0.15
aaa	—	—	0.10
bbb	—	—	0.10
ccc	—	—	0.05
ddd	—	—	0.10

C8051F310DK Development Kit