

### Analog Peripherals

#### 10-Bit ADC

- Programmable throughput up to 200 ksps
- Up to 16 external inputs; programmable as single-ended or differential
- Reference from internal  $V_{REF}$ ,  $V_{DD}$ , or external pin
- Internal or external start of conversion sources
- Built-in temperature sensor ( $\pm 3^\circ\text{C}$ )

#### 10-bit DAC (Current Mode)

#### Comparator

- Programmable hysteresis and response time
- Configurable to generate interrupts or reset
- Low current (0.4  $\mu\text{A}$ )

### 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: 6.4 mA at 25 MHz  
9  $\mu\text{A}$  at 32 kHz
- Typical stop mode current: <0.1  $\mu\text{A}$

### High-Speed 8051 $\mu\text{C}$ 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

- 768 bytes data RAM
- 8 kB Flash; in-system programmable in 512 byte sectors (512 bytes are reserved)

### Digital Peripherals

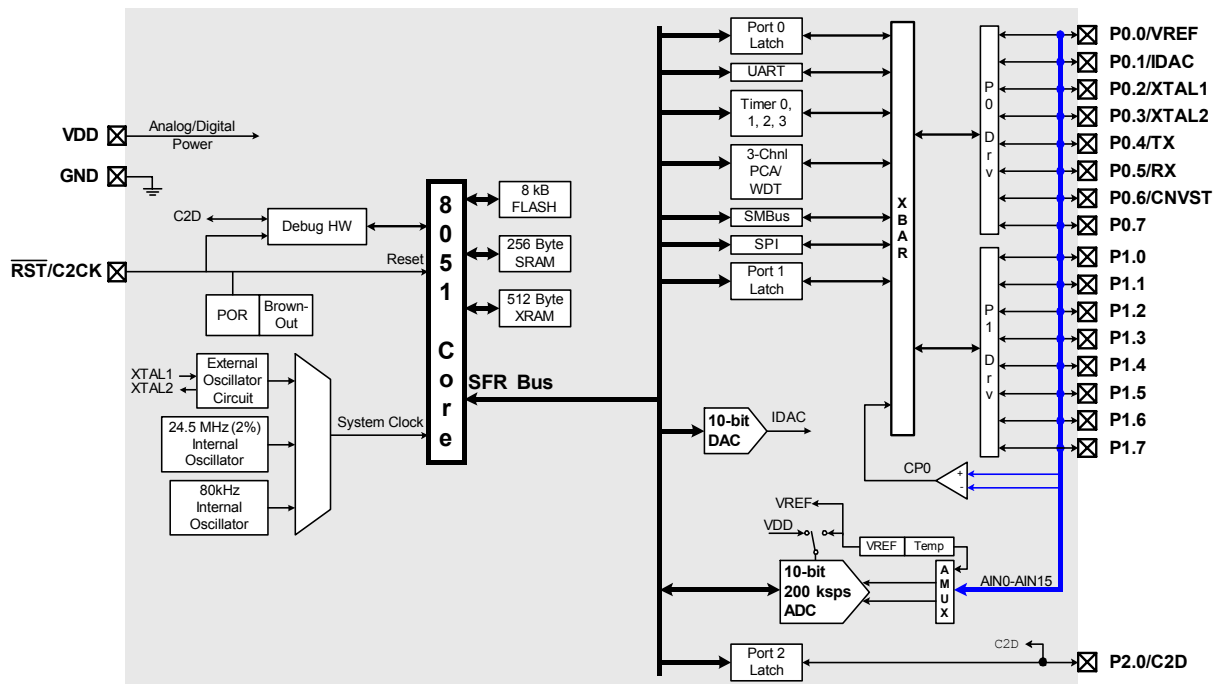
- 17 port I/O; all are 5 V tolerant
- Hardware SMBus™ (I2C™ compatible), SPI™, and UART serial ports available concurrently
- Programmable 16-bit counter/timer array with three capture/compare modules, WDT
- 4 general-purpose 16-bit counter/timers
- Real-time clock mode using PCA or timer and external clock source

### Clock Sources

- Two internal oscillators:
  - 24.5 MHz, 2% accuracy supports UART operation
  - 80 kHz low frequency, low-power
- External oscillator: Crystal, RC, C, or Clock (1 or 2 pin modes)
- Can switch between clock sources on-the-fly

### 20-Pin DIP

Temperature Range:  $-40$  to  $+85^\circ\text{C}$



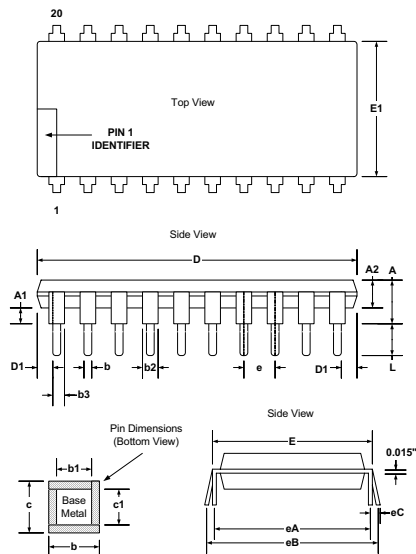
### Selected Electrical Specifications

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

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
<b>GLOBAL CHARACTERISTICS</b>					
Supply Voltage		2.7		3.6	V
Supply Current with CPU active	Clock = 25 MHz		6.4		mA
	Clock = 1 MHz		0.36		mA
	Clock = 80 kHz; $V_{DD}$ Monitor Disabled		20		$\mu$ A
	Clock = 32 kHz; $V_{DD}$ Monitor Disabled		9		$\mu$ A
Supply Current (shutdown)	Oscillator off; $V_{DD}$ Monitor Disabled		<0.1		$\mu$ A
Clock Frequency Range		DC		25	MHz
<b>INTERNAL OSCILLATORS</b>					
Frequency (OSC0)		24.0	24.5	25.0	MHz
Frequency (OSC1)	Note 1		80		kHz
<b>A/D CONVERTER</b>					
Resolution			10		bits
Integral Nonlinearity			$\pm 1/2$	$\pm 1$	LSB
Differential Nonlinearity	Guaranteed Monotonic		$\pm 1/2$	$\pm 1$	LSB
Signal-to-Noise Plus Distortion		53	55.5		dB
Throughput Rate				200	ksps
Input Voltage Range		0		$V_{REF}$	V
<b>D/A CONVERTER</b>					
Resolution			10		bits
Integral Nonlinearity			$\pm 1/2$		LSB
Differential Nonlinearity	Guaranteed Monotonic		$\pm 1/2$	$\pm 1$	LSB
Output Settling Time			5		$\mu$ s
<b>COMPARATOR</b>					
Response Time Mode0	(CP+) – (CP-) = 100 mV		0.1		$\mu$ s
Current Consumption Mode0			7.6		$\mu$ A
Response Time Mode1	(CP+) – (CP-) = 100 mV		0.18		$\mu$ s
Current Consumption Mode1			3.2		$\mu$ A
Response Time Mode2	(CP+) – (CP-) = 100 mV		0.32		$\mu$ s
Current Consumption Mode2			1.3		$\mu$ A
Response Time Mode3	(CP+) – (CP-) = 100 mV		1		$\mu$ s
Current Consumption Mode3			0.4		$\mu$ A

Note 1: OSC1 can be calibrated in 2.5% steps using an internal calibration register.

### Package Information



	INCHES		
	MIN	TYP	MAX
A	—	—	0.210
A1	0.015	—	—
A2	0.115	0.130	0.195
b	0.014	0.018	0.022
b1	0.014	0.018	0.020
b2	0.045	0.060	0.070
b3	0.030	0.039	0.045
c	.008	0.010	0.014
c1	0.008	0.010	0.011
D	0.980	1.030	1.060
D1	0.005	—	—
E	0.300	0.310	0.325
E1	0.240	0.250	0.280
e	—	0.100	—
eA	—	0.300	—
eB	—	—	0.430
eC	0.000	—	0.060
L	0.115	0.130	0.150

### C8051F330DK Development Kit

